

Transistors

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Application Note

Since reliability can be affected adversely by improper storage environment or handling methods during Characteristic tests, please observe the following cautions.

■ Cautions for Storage

- Ensure that storage conditions comply with the normal temperature (5 to 35°C) and the normal relative humidity (around 40 to 75%), and avoid storage locations that experience high temperature and humidity, or extreme changes in temperature or humidity.
- Avoid locations where dust or harmful gases are present, and avoid direct sunlight.
- Reinspect the devices for rust in leads and solderability after stored for a long time.

■ Cautions for Characteristic Tests and Handling

On characteristics test at incoming inspection, etc, take good care to avoid the surge voltages from the test equipment, the short circuit at terminals, or the wrong connection.

■ Silicone Grease

When using a heatsink, please coat thinly and evenly the back surface of the device and both surfaces of the insulating plate with silicone grease to lower the thermal resistance between the device and the heatsink.

Please select proper silicone grease carefully since the oil in some grease products may penetrate the device and result in an extremely short device life.

Recommended Silicone Grease

- G-746 (Shin-Etsu Chemical)
- YG6260 (GE Toshiba Silicones)
- SC102 (Dow Corning Toray Silicone)

■ Mounting Torque

When mounting torque is insufficient, thermal resistance increases, and so heat radiation effect is decreased. When the torque is excessive, the screw may be broken, the heatsink may be deformed, and the device frame may be distorted, resulting in the device damage. Recommended mounting torque per package is as follows:

● Mounting Torque Table

Package	Screw Torque
TO-220 (MT-25)	0.490 to 0.686 N•m (5 to 7kgf•cm)
TO-220F (FM20)	
TO-3P (MT-100)	0.686 to 0.882 N•m (7 to 9kgf•cm)
TO-3PF(FM100)	
MT-200 (fixed at two points)	
SIP with Fin (SLA)	0.588 to 0.784 N•m (6 to 8kgf•cm)

* When the surface of a heatsink where Full Mold package is to be mounted is not flat due to the burred metal bracket for screwing around the mounting hole of the heatsink, the resin of the package might be cracked even if the torque is lower than the recommended value.

* When a screw is fastened with an air driver for the Full Mold package, a large impact is generated at the time of stop, and the resin may crack even if the torque is lower than the recommended value. An electric driver, therefore, should be used instead of an air driver.

■ Heatsink

A larger contact area between the device and the heatsink is required for more effective heat radiation. To ensure a larger contact area, minimize mounting holes. And select a heatsink with a surface smooth enough and free from burrs and slivers.

■ Soldering Temperature

In general, the device mounted on a printed circuit board is subjected to high temperatures from flow solder in a solder bath, or, from a soldering iron at hand soldering.

The testing method and test conditions (JIS-C-7021 standards) for a device's heat resistance to soldering are:

At a distance of 1.5mm from the device's main body, apply 260°C for 10 seconds, and 350°C for 3 seconds.

Please observe these limits and finish soldering in as short a time as possible.

■ Antistatic measure for power MOS FET Arrays

- When handling the device, body grounding is necessary. Wear a wrist strap with a 1 MΩ resistor close to the body in the wrist strap to prevent electric shock.
- Use a conductive tablemat and a floor mat at the device-handling workbench and ground them properly.
- When using a curve tracer or other measuring equipment, ground them as well.
- In soldering, ground the soldering iron tip and the solder bath to prevent a leakage voltage from damaging the device.
- As an antistatic measure for device containers, use Sanken shipping containers or a conductive containers, or use aluminum foils. Since reliability can be affected adversely by improper storage environment or handling methods during Characteristic tests, please observe the following cautions.

Selection Guide

$V_{CE0}-I_C$

Collector-Emitter Voltage $V_{CE0}(V)$	800		C3678 C4020 C4304 C4445		C3679 C4300		C3680 C4301											
	600										C4706 C5924							
	550					C4518 C4518A C5287 C5586				C3927 C4557								
	450							C5830										
	400					C5130		C3832 C4546		C4138	C3833 C4297 C5071		C4139 C4298 C4434				C4140	
	380						D2141											
	300	C2023 C5333																
	250						D2017											
	230												A1294 C3263 A2151A C6011A			A1295 C3264		
	200	A1668 C4382	D2016			D2557 D2558							A1493 C3857 A2151 C6011			A1494 C3858		
	180	A1859A C4883A											A1386A A1492 A1673 C3519A C3856 C4388			A1216 C2922		
	160												A1215 A1386 C2921 C3519					
	150	A1667 A1859 C4381 C4883						B1559 B1587 D2389 D2438	A1186 B1560 B1588 C2837 D2390 D2439	B1570 D2401	A1303 A1860 C3284 C4886		B1647 B1649 D2560 D2562			B1648 D2561		
	140								A1695 A1909 C4468 C5101									
	120			D2015		D1769 D1785 D2045	C3834 C3835 C4153	A1694 A1908 C4467 C5100	B1259 D2081					B1382 B1420 D2082				B1383 D2083
	110					B1685 B1686 B1687 D2641 D2642 D2643												
	100																	
	80		C3852A	A1488A C3851A D2014		B1258 A1693 A1725 A1726 A1907 C4466 C4511 C4512 C5099												
60		C3852	A1262 A1488 B1257 C3179 C3851 D1796								A1568 B1351							
50		C4495							C4024	A1567 A1746 C4064		C4131						
		2	3	4	5	6	7	8	10	12	14	15	16	17	18	25		
		Collector Current $I_C(A)$																

Audio Transistors

Output Transistors

P _c (W)	I _c (A)	V _{CE0} (V)	Chip						Package
			Single Transistors				Darlington		
			General		LAPT				
30	6	80	2SA1725	2SC4511					TO-220F (FM20)
	6	110					2SB1686	2SD2642	TO-220F (FM20)
50	6	80	2SA1726	2SC4512					TO-220 (MT-25)
	6	80	2SA1693	2SC4466					TO-3P (MT-100)
60	6	80	2SA1907	2SC5099					TO-3PF (FM100)
	6	110					2SB1685	2SD2641	TO-3P (MT-100)
	6	110					2SB1687	2SD2643	TO-3PF (FM100)
75	8	120	2SA1908	2SC5100					TO-3PF (FM100)
	8	150					2SB1587	2SD2438	TO-3PF (FM100)
80	8	120	2SA1694	2SC4467					TO-3P (MT-100)
	10	140	2SA1909	2SC5101					TO-3PF (FM100)
	8	150					2SB1559	2SD2389	TO-3P (MT-100)
	10	150					2SB1588	2SD2439	TO-3PF (FM100)
85	14	150			2SA1860	2SC4886			TO-3PF (FM100)
	15	150					2SB1649	2SD2562	TO-3PF (FM100)
	15	180	2SA1673	2SC4388					TO-3PF (FM100)
100	10	140	2SA1695	2SC4468					TO-3P (MT-100)
	10	150			2SA1186	2SC2837			TO-3P (MT-100)
	10	150					2SB1560	2SD2390	TO-3P (MT-100)
125	14	150			2SA1303	2SC3284			TO-3P (MT-100)
130	15	150					2SB1647	2SD2560	TO-3P (MT-100)
	15	160			2SA1386	2SC3519			TO-3P (MT-100)
	15	180	2SA1492	2SC3856					TO-3P (MT-100)
	15	180			2SA1386A	2SC3519A			TO-3P (MT-100)
	15	230			2SA1294	2SC3263			TO-3P (MT-100)
150	12	150					2SB1570	2SD2401	MT-200 (fixed at two points)
	15	160			2SA1215	2SC2921			MT-200 (fixed at two points)
	15	200	2SA1493	2SC3857					MT-200 (fixed at two points)
160	15	200	2SA2151	2SC6011					TO-3P (MT-100)
	15	230	2SA2151A	2SC6011A					TO-3P (MT-100)
200	17	150					2SB1648	2SD2561	MT-200 (fixed at two points)
	17	180			2SA1216	2SC2922			MT-200 (fixed at two points)
	17	200	2SA1494	2SC3858					MT-200 (fixed at two points)
	17	230			2SA1295	2SC3264			MT-200 (fixed at two points)

LAPT: Multi-Emitter for High Frequency

Output Transistors with Temperature Compensating Function (Refer to our Web site for applications)

Part Number	P _c (W)	I _c (A)	V _{CE0} (V)	Package
STD03P	160	15	160	TO3P-5pin

Driver and Temperature Compensating Transistors

Part Number	P _c (W)	V _{CE0} (V)	I _c (A)	h _{FE} (min)	f _T (MHz)	Package	Remarks
2SC4495	25	50	3	500	40	TO-220F (FM20)	For temperature compensation
2SA1859	20	150	2	60	60/120	TO-220F (FM20)	Driver
2SA1859A	20	180	2	60	60/120	TO-220F (FM20)	Driver
2SA1667	25	150	2	60	20/15	TO-220F (FM20)	Driver
2SA1668	25	200	2	60	20/15	TO-220F (FM20)	Driver

Refer to our Web site for the h_{FE} ranks.

Switching Transistors

■DC-DC Converter

Part Number	V _{CB0} (V)	V _{CE0} (V)	I _c (A)	P _c (W)	Package
2SC4024	100	50	10	35	TO-220F (FM20)
2SC4131			15	60	TO-3PF (FM100)
2SC4153	200	120	7	30	TO-220F (FM20)
2SC3834				50	TO-220 (MT-25)
2SC3835				70	TO-3P (MT-100)

■For AC100V Input

Part Number	V _{CB0} (V)	V _{CE0} (V)	I _c (A)	P _c (W)	Package
2SC3832	500	400	7	50	TO-220 (MT-25)
2SC4138			10	80	TO-3P (MT-100)
2SC4297			12	75	TO-3PF (FM100)
2SC3833				100	TO-3PF (FM100)
2SC5071				100	TO-3P (MT-100)
2SC4298			15	80	TO-3P (MT-100)
2SC4139				120	TO-3P (MT-100)
2SC4434				120	TO-3P (MT-100)
2SC4140			18	130	TO-3P (MT-100)
2SC5130	5	30		TO-220F (FM20)	
2SC4546	600	400	7	30	TO-220F (FM20)

■For AC200V Input

Part Number	V _{CB0} (V)	V _{CE0} (V)	I _c (A)	P _c (W)	Package	
2SC4518	900	550	5	35	TO-220F (FM20)	
2SC5287				80	TO-3P (MT-100)	
2SC4557			10	80	TO-3PF (FM100)	
2SC3927		120		TO-3P (MT-100)		
2SC5586		600	5	70	TO-3PF (FM100)	
2SC4706			14	130	TO-3P (MT-100)	
2SC5924				90	TO-3PF (FM100)	
2SC4304		800	3	3	35	TO-220F (FM20)
2SC4020					50	TO-220 (MT-25)
2SC4445					60	TO-3PF (FM100)
2SC3678			5	80	TO-3P (MT-100)	
2SC4300				75	TO-3PF (FM100)	
2SC3679	100		TO-3P (MT-100)			
2SC4301	7		80	TO-3PF (FM100)		
2SC3680		120	TO-3P (MT-100)			
2SC4518A	1000	550	5	35	TO-220F (FM20)	

Specifications List by Part Number

Part Number	Applications	Absolute Maximum Ratings						I _{CBO}		h _{FE}			
		V _{CB0}	V _{CE0}	I _c	P _c	I _{CBO}	Conditions	min	max	Conditions			
		(V)	(V)	(A)	(W)					V _{CB}	V _{CE}	I _c	
						(μA)	(V)	(V)	(A)				
2SA1186	Audio, general-purpose	-150	-150	-10	100	-100	-150	50	180	-4	-3		
2SA1215	Audio, general-purpose	-160	-160	-15	150	-100	-160	50	180	-4	-5		
2SA1216	Audio, general-purpose	-180	-180	-17	200	-100	-180	30	180	-4	-8		
2SA1262	Audio, general-purpose	-60	-60	-4	30	-100	-60	40		-4	-1		
2SA1294	Audio, general-purpose	-230	-230	-15	130	-100	-230	50	140	-4	-5		
2SA1295	Audio, general-purpose	-230	-230	-17	200	-100	-230	50	140	-4	-5		
2SA1303	Audio, general-purpose	-150	-150	-14	125	-100	-150	50	180	-4	-5		
2SA1386	Audio, general-purpose	-160	-160	-15	130	-100	-160	50	180	-4	-5		
2SA1386A	Audio, general-purpose	-180	-180	-15	130	-100	-180	50	180	-4	-5		
2SA1488	Audio, general-purpose	-60	-60	-4	25	-100	-60	40		-4	-1		
2SA1488A	Audio, general-purpose	-80	-80	-4	25	-100	-80	40		-4	-1		
2SA1492	Audio, general-purpose	-180	-180	-15	130	-100	-180	50	180	-4	-3		
2SA1493	Audio, general-purpose	-200	-200	-15	150	-100	-200	50	180	-4	-5		
2SA1494	Audio, general-purpose	-200	-200	-17	200	-100	-200	50	180	-4	-8		
2SA1567	DC motor driver, chopper regulator, general-purpose	-50	-50	-12	35	-100	-50	50		-1	-6		
2SA1568	DC motor driver, chopper regulator, general-purpose	-60	-60	±12	35	-100	-60	50		-1	-6		
2SA1667	TV vertical output, audio output driver, general-purpose	-150	-150	-2	25	-10	-150	60		-10	-0.7		
2SA1668	TV vertical output, audio output driver, general-purpose	-200	-200	-2	25	-10	-200	60		-10	-0.7		
2SA1673	Audio, general-purpose	-180	-180	-15	85	-10	-180	50	180	-4	-3		
2SA1693	Audio, general-purpose	-80	-80	-6	60	-10	-80	50	180	-4	-2		
2SA1694	Audio, general-purpose	-120	-120	-8	80	-10	-120	50	180	-4	-3		
2SA1695	Audio, general-purpose	-140	-140	-10	100	-10	-140	50	180	-4	-3		
2SA1725	Audio, general-purpose	-80	-80	-6	30	-10	-80	50	180	-4	-2		
2SA1726	Audio, general-purpose	-80	-80	-6	50	-10	-80	50	180	-4	-2		
2SA1746	Chopper regulator, switch, general-purpose	-70	-50	-12 (Pulse -20)	60	-10	-70	50		-1	-5		
2SA1859	Audio output driver, TV velocity modulation	-150	-150	-2	20	-10	-150	60	240	-10	-0.7		
2SA1859A	Audio output driver, TV velocity modulation	-180	-180	-2	20	-10	-180	60	240	-10	-0.7		
2SA1860	Audio, general-purpose	-150	-150	-14	80	-100	-150	50	180	-4	-5		
2SA1907	Audio, general-purpose	-80	-80	-6	60	-10	-80	50	180	-4	-2		
2SA1908	Audio, general-purpose	-120	-120	-8	75	-10	-120	50	180	-4	-3		
2SA1909	Audio, general-purpose	-140	-140	-10	80	-10	-140	50	180	-4	-3		
2SA2151	Audio, general-purpose	-200	-200	-15	160	-10	-200	50	180	-4	-3		
2SA2151A	Audio, general-purpose	-230	-230	-15	160	-10	-230	50	180	-4	-3		
2SB1257	Solenoid/relay/motor driver, general-purpose	-60	-60	-4 (Pulse -6)	25	-10	-60	2000		-4	-3		
2SB1258	Solenoid/relay/motor driver, general-purpose	-100	-100	-6 (Pulse -10)	30	-10	-100	1000		-2	-3		
2SB1259	Solenoid/relay/motor driver, general-purpose	-120	-120	-10 (Pulse -15)	30	-10	-120	2000		-4	-5		
2SB1351	Printer head/solenoid/relay/motor driver, general-purpose	-60	-60	-12 (Pulse -20)	30	-10	-60	2000		-4	-10		
2SB1382	Chopper regulator, DC motor driver, general-purpose	-120	-120	-16 (Pulse -26)	75	-10	-120	2000		-4	-8		
2SB1383	Chopper regulator, DC motor driver, general-purpose	-120	-120	-25 (Pulse -40)	120	-10	-120	2000		-4	-12		
2SB1420	Chopper regulator, DC motor driver, general-purpose	-120	-120	-16 (Pulse -26)	80	-10	-120	2000		-4	-8		
2SB1559	Audio, series regulator, general-purpose	-160	-150	-8	80	-100	-160	5000	30000	-4	-6		
2SB1560	Audio, series regulator, general-purpose	-160	-150	-10	100	-100	-160	5000	30000	-4	-7		
2SB1570	Audio, series regulator, general-purpose	-160	-150	-12	150	-100	-160	5000	30000	-4	-7		
2SB1587	Audio, series regulator, general-purpose	-160	-150	-8	75	-100	-160	5000	30000	-4	-6		
2SB1588	Audio, series regulator, general-purpose	-160	-150	-10	80	-100	-160	5000	30000	-4	-7		
2SB1647	Audio, series regulator, general-purpose	-150	-150	-15	130	-100	-150	5000	30000	-4	-10		
2SB1648	Audio, series regulator, general-purpose	-150	-150	-17	200	-100	-150	5000	30000	-4	-10		
2SB1649	Audio, series regulator, general-purpose	-150	-150	-15	85	-100	-150	5000	30000	-4	-10		
2SB1685	Audio, series regulator, general-purpose	-110	-110	-6	60	-100	-110	5000	30000	-4	-5		
2SB1686	Audio, series regulator, general-purpose	-110	-110	-6	30	-100	-110	5000	30000	-4	-5		
2SB1687	Audio, series regulator, general-purpose	-110	-110	-6	60	-100	-110	5000	30000	-4	-5		

Electrical Characteristics												Complementary	Package
V _{CE (sat)}	V _{BE (sat)}	Conditions			f _T		Switching Time			C _{ob}			
(V)	(V)	I _c	I _B	MHz	V _{CE}	I _E	t _{on}	t _{stg}	t _r				
max	max	(A)	(A)		(V)	(A)	(μs)	(μs)	(μs)	(pF)			
-2.0		-5	-0.5	60	-12	1	0.25typ	0.8typ	0.2typ	110typ	2SC2837	TO-3P (MT-100)	
-2.0		-5	-0.5	50	-12	2	0.25typ	0.85typ	0.2typ	400typ	2SC2921	MT-200	
-2.0		-8	-0.8	40	-12	2	0.3typ	0.7typ	0.2typ	500typ	2SC2922	MT-200	
-0.6		-2	-0.2	15	-12	0.2	0.25typ	0.75typ	0.25typ	90typ	2SC3179	TO-220 (MT-25)	
-2.0		-5	-0.5	35	-12	2	0.35typ	1.5typ	0.3typ	500typ	2SC3263	TO-3P (MT-100)	
-2.0		-5	-0.5	35	-12	2	0.35typ	1.5typ	0.3typ	500typ	2SC3264	MT-200	
-2.0		-5	-0.5	50	-12	2	0.25typ	0.85typ	0.2typ	400typ	2SC3284	TO-3P (MT-100)	
-2.0		-5	-0.5	40	-12	2	0.3typ	0.7typ	0.2typ	500typ	2SC3519	TO-3P (MT-100)	
-2.0		-5	-0.5	40	-12	2	0.3typ	0.7typ	0.2typ	500typ	2SC3519A	TO-3P (MT-100)	
-0.5		-2	-0.2	15	-12	0.2	0.25typ	0.75typ	0.25typ	90typ	2SC3851	TO-220F (FM20)	
-0.5		-2	-0.2	15	-12	0.2	0.25typ	0.75typ	0.25typ	90typ	2SC3851A	TO-220F (FM20)	
-2.0		-5	-0.5	20	-12	0.5	0.6typ	0.9typ	0.2typ	500typ	2SC3856	TO-3P (MT-100)	
-3.0		-10	-1	20	-12	0.5	0.3typ	0.9typ	0.2typ	400typ	2SC3857	MT-200	
-2.5		-10	-1	20	-12	1	0.6typ	0.9typ	0.2typ	500typ	2SC3858	MT-200	
-0.35		-6	-0.3	40	-12	0.5	0.4typ	0.4typ	0.2typ	330typ	2SC4064	TO-220F (FM20)	
-0.35		-6	-0.3	40	-12	0.5	0.4typ	0.4typ	0.2typ	330typ		TO-220F (FM20)	
-1.0		-0.7	-0.07	20	-12	0.2	0.4typ	1.5typ	0.5typ	60typ	2SC4381	TO-220F (FM20)	
-1.0		-0.7	-0.07	20	-12	0.2	0.4typ	1.5typ	0.5typ	60typ	2SC4382	TO-220F (FM20)	
-2.0		-5	-0.5	20	-12	0.5	0.6typ	0.9typ	0.2typ	500typ	2SC4388	TO-3PF (FM100)	
-1.5		-2	-0.2	20	-12	0.5	0.18typ	1.1typ	0.21typ	150typ	2SC4466	TO-3P (MT-100)	
-1.5		-3	-0.3	20	-12	0.5	0.14typ	1.4typ	0.21typ	300typ	2SC4467	TO-3P (MT-100)	
-0.5		-5	-0.5	20	-12	0.5	0.17typ	1.86typ	0.27typ	400typ	2SC4468	TO-3P (MT-100)	
-0.5		-2	-0.2	20	-12	0.5	0.18typ	1.1typ	0.21typ	150typ	2SC4511	TO-220F (FM20)	
-0.5		-2	-0.2	20	-12	0.5	0.18typ	1.1typ	0.21typ	150typ	2SC4512	TO-220 (MT-25)	
-0.5	-1.2	-5	-0.08	25	-12	1	0.5typ	0.6typ	0.3typ	400typ		TO-3PF (FM100)	
-1.0		-0.7	-0.07	60	-12	0.7	0.5typ	1typ	0.5typ	30typ	2SC4883	TO-220F (FM20)	
-1.0		-0.7	-0.07	60	-12	0.7	0.5typ	1typ	0.5typ	30typ	2SC4883A	TO-220F (FM20)	
-2.0		-5	-0.5	50	-12	2	0.25typ	0.85typ	0.2typ	400typ	2SC4886	TO-3PF (FM100)	
-0.5		-12	-0.2	20	-12	0.5	0.18typ	1.1typ	0.21typ	150typ	2SC5099	TO-3PF (FM100)	
-0.5		-3	-0.3	20	-12	0.5	0.14typ	1.4typ	0.21typ	300typ	2SC5100	TO-3PF (FM100)	
-0.5		-5	-0.5	20	-12	0.5	0.17typ	1.86typ	0.27typ	400typ	2SC5101	TO-3PF (FM100)	
-0.5		-5	-0.5	20	-12	-0.5	-	-	-	450typ	2SC6011	TO-3P (MT-100)	
-0.5		-5	-0.5	20	-12	-0.5	-	-	-	450typ	2SC6011A	TO-3P (MT-100)	
-1.5	-2.0	-3	-0.006	200	-12	0.2	0.4typ	0.8typ	0.6typ	75typ	2SD2014	TO-220F (FM20)	
-1.5	-2.0	-3	-0.006	100	-12	0.2	0.6typ	1.6typ	0.5typ	100typ	2SD1785	TO-220F (FM20)	
-1.5	-2.0	-5	-0.01	100	-12	0.2	0.6typ	1.6typ	0.5typ	145typ	2SD2081	TO-220F (FM20)	
-1.5	-2.0	-10	-0.02	130	-12	1	0.7typ	1.5typ	0.6typ	170typ		TO-220F (FM20)	
-1.5	-2.5	-8	-0.016	50	-12	1	0.8typ	1.8typ	1typ	350typ	2SD2082	TO-3PF (FM100)	
-1.8	-2.5	-12	-0.024	50	-12	1	1typ	3typ	1typ	230typ	2SD2083	TO-3P (MT-100)	
-1.5	-2.5	-8	-0.016	50	-12	1	1typ	3typ	1typ	350typ		TO-3P (MT-100)	
-2.5	-3.0	-6	-0.006	65	-12	1	0.7typ	3.6typ	0.9typ	160typ	2SD2389	TO-3P (MT-100)	
-2.5	-3.0	-7	-0.007	50	-12	2	0.8typ	3typ	1.2typ	230typ	2SD2390	TO-3P (MT-100)	
-2.5	-3.0	-7	-0.007	50	-12	2	0.8typ	3typ	1.2typ	230typ	2SD2401	MT-200	
-2.5	-3.0	-6	-0.006	65	-12	1	0.7typ	3.6typ	0.9typ	160typ	2SD2438	TO-3PF (FM100)	
-2.5	-3.0	-7	-0.007	50	-12	2	0.8typ	3typ	1.2typ	230typ	2SD2439	TO-3PF (FM100)	
-2.5	-3.0	-10	-0.01	45	-12	2	0.7typ	1.6typ	1.1typ	320typ	2SD2560	TO-3P (MT-100)	
-2.5	-3.0	-10	-0.01	45	-12	2	0.7typ	1.6typ	1.1typ	320typ	2SD2561	MT-200	
-2.5	-3.0	-10	-0.01	45	-12	2	0.7typ	1.6typ	1.1typ	320typ	2SD2562	TO-3PF (FM100)	
-2.5	-3.0	-5	-0.005	100	-12	0.5	1.1typ	3.2typ	1.1typ	110typ	2SD2641	TO-3P (MT-100)	
-2.5	-3.0	-5	-0.005	100	-12	0.5	1.1typ	3.2typ	1.1typ	110typ	2SD2642	TO-220F (FM20)	
-2.5	-3.0	-5	-0.005	100	-12	0.5	1.1typ	3.2typ	1.1typ	110typ	2SD2643	TO-3PF (FM100)	

Part Number	Applications	Absolute Maximum Ratings						I _{CBO}		h _{FE}		Conditions	
		V _{CEO}	V _{CEO}	I _C	P _C	I _{CBO}	Conditions	min	max	V _{CE}	I _C		
		(V)	(V)	(A)	(W)							(μA)	(V)
2SC2023	Series regulator, switch, general-purpose	300	300	2	40	1mA	300	30			4	0.5	
2SC2837	Audio, general-purpose	150	150	10	100	100	150	50	180	4	3		
2SC2921	Audio, general-purpose	160	160	15	150	100	160	50	180	4	5		
2SC2922	Audio, general-purpose	180	180	17	200	100	180	30	180	4	8		
2SC3179	Audio, general-purpose	80	60	4	30	100	80	40		4	1		
2SC3263	Audio, general-purpose	230	230	15	130	100	230	50	140	4	5		
2SC3264	Audio, general-purpose	230	230	17	200	100	230	50	140	4	5		
2SC3284	Audio, general-purpose	150	150	14	125	100	150	50	180	4	5		
2SC3519	Audio, general-purpose	160	160	15	130	100	160	50	180	4	5		
2SC3519A	Audio, general-purpose	180	180	15	130	100	180	50	180	4	5		
2SC3678	Switching regulator, general-purpose	900	800	3 (Pulse 6)	80	100	800	10	30	4	1		
2SC3679	Switching regulator, general-purpose	900	800	5 (Pulse 10)	100	100	800	10	30	4	2		
2SC3680	Switching regulator, general-purpose	900	800	7 (Pulse 14)	120	100	800	10	30	4	3		
2SC3832	Switching regulator, general-purpose	500	400	7 (Pulse 14)	50	100	500	10	30	4	3		
2SC3833	Switching regulator, general-purpose	500	400	12 (Pulse 24)	100	100	500	10	30	4	7		
2SC3834	Humidifier, DC-DC converter, general-purpose	200	120	7 (Pulse 14)	50	100	200	70	220	4	3		
2SC3835	Humidifier, DC-DC converter, general-purpose	200	120	7 (Pulse 14)	70	100	200	70	220	4	3		
2SC3851	Audio, PPC high voltage power supply, general-purpose	80	60	4	25	100	80	40	320	4	1		
2SC3851A	Audio, PPC high voltage power supply, general-purpose	100	80	4	25	100	100	40	320	4	1		
2SC3852	Solenoid/motor driver/series regulator, general-purpose	80	60	3	25	10	80	500		4	0.5		
2SC3852A	Solenoid/motor driver/series regulator, general-purpose	100	80	3	25	10	100	500		4	0.5		
2SC3856	Audio, general-purpose	200	180	15	130	100	200	80	180	4	3		
2SC3857	Audio, general-purpose	200	200	15	150	100	200	50	180	4	5		
2SC3858	Audio, general-purpose	200	200	17	200	100	200	50	180	4	8		
2SC3927	Switching regulator, general-purpose	900	550	10 (Pulse 15)	120	100	800	10	28	4	5		
2SC4020	Switching regulator, general-purpose	900	800	3 (Pulse 6)	50	100	800	10	30	4	0.7		
2SC4024	DC-DC converter, emergency lamp inverter, general-purpose	100	50	10	35	100	100	300	1600	4	1		
2SC4064	DC motor driver, general-purpose	50	50	12	35	100	50	50		1	6		
2SC4131	DC-DC converter, emergency lamp inverter, general-purpose	100	50	15 (Pulse 20)	60	10	100	60	360	1	5		
2SC4138	Switching regulator, general-purpose	500	400	10 (Pulse 20)	80	100	500	10	30	4	6		
2SC4139	Switching regulator, general-purpose	500	400	15 (Pulse 30)	120	100	500	10	30	4	8		
2SC4140	Switching regulator, general-purpose	500	400	18 (Pulse 36)	130	100	500	10	30	4	10		
2SC4153	Humidifier, DC-DC converter, general-purpose	200	120	7 (Pulse 14)	30	100	200	70	220	4	3		
2SC4297	Switching regulator, general-purpose	500	400	12 (Pulse 24)	75	100	500	10	30	4	7		
2SC4298	Switching regulator, general-purpose	500	400	15 (Pulse 30)	80	100	500	10	30	4	8		
2SC4300	Switching regulator, general-purpose	900	800	5 (Pulse 10)	75	100	800	10	30	4	2		
2SC4301	Switching regulator, lighting inverter, general-purpose	900	800	7 (Pulse 14)	80	100	800	10	30	4	3		
2SC4304	Switching regulator, general-purpose	900	800	3 (Pulse 6)	35	100	800	10	30	4	0.7		
2SC4381	TV vertical output, audio output driver, general-purpose	150	150	2	25	10	150	60		10	0.7		
2SC4382	TV vertical output, audio output driver, general-purpose	200	200	2	25	10	200	60		10	0.7		
2SC4388	Audio, general-purpose	200	180	15	85	10	200	50	180	4	3		
2SC4434	Switching regulator, lighting inverter, general-purpose	500	400	15 (Pulse 30)	120	100	500	10	25	4	8		
2SC4445	Switching regulator, general-purpose	900	800	3 (Pulse 6)	60	100	800	10	30	4	0.7		
2SC4466	Audio, general-purpose	120	80	6	60	10	120	50	180	4	2		
2SC4467	Audio, general-purpose	160	120	8	80	10	160	50	180	4	3		
2SC4468	Audio, general-purpose	200	140	10	100	10	200	50	180	4	3		
2SC4495	For audio temperature compensation, general-purpose	80	50	3	25	10	80	500		4	0.5		
2SC4511	Audio, general-purpose	120	80	6	30	10	120	50	180	4	2		
2SC4512	Audio, general-purpose	120	80	6	50	10	120	50	180	4	2		
2SC4518	Switching regulator, lighting inverter, general-purpose	900	550	5 (Pulse 10)	35	100	800	10	25	4	1.8		
2SC4518A	Switching regulator, lighting inverter, general-purpose	1000	550	5 (Pulse 10)	35	100	800	10	25	4	1.8		

Electrical Characteristics												Complementary	Package
V _{CE (sat)}	V _{BE (sat)}	Conditions			f _T	Switching Time			C _{ob}				
(V)	(V)	I _c	I _B	MHz	V _{CE}	I _E	t _{on}	t _{stg}	t _r	(pF)			
max	max	(A)	(A)		(V)	(A)	(μS)	(μS)	(μS)				
1.0		1	0.2	10	12	-0.2	0.3typ	4typ	1typ	75typ		TO-220 (MT-25)	
2.0		5	0.5	70	12	-1	0.2typ	1.4typ	0.35typ	60typ	2SA1186	TO-3P (MT-100)	
2.0		5	0.5	60	12	-2	0.2typ	1.5typ	0.35typ	200typ	2SA1215	MT-200	
2.0		8	0.8	50	12	-2	0.2typ	1.3typ	0.45typ	250typ	2SA1216	MT-200	
0.6		2	0.2	15	12	-0.2	0.2typ	1.9typ	0.29typ	60typ	2SA1262	TO-220 (MT-25)	
2.0		5	0.5	60	12	-2	0.3typ	2.4typ	0.5typ	250typ	2SA1294	TO-3P (MT-100)	
2.0		5	0.5	60	12	-2	0.3typ	2.4typ	0.5typ	250typ	2SA1295	MT-200	
2.0		5	0.5	60	12	-2	0.2typ	1.5typ	0.35typ	200typ	2SA1303	TO-3P (MT-100)	
2.0		5	0.5	50	12	-2	0.2typ	1.3typ	0.45typ	250typ	2SA1386	TO-3P (MT-100)	
2.0		5	0.5	50	12	-2	0.2typ	1.3typ	0.45typ	250typ	2SA1386A	TO-3P (MT-100)	
0.5	1.2	1	0.2	6	12	-0.3	1max	5max	1max	50typ		TO-3P (MT-100)	
0.5	1.2	2	0.4	6	12	-0.5	1max	5max	1max	75typ		TO-3P (MT-100)	
0.5	1.2	3	0.6	6	12	-2	1max	5max	1max	105typ		TO-3P (MT-100)	
0.5	1.3	3	0.6	10	12	-0.5	1max	3max	0.5max	50typ		TO-220 (MT-25)	
0.5	1.3	7	1.4	10	12	-1	1max	3max	0.5max	105typ		TO-3P (MT-100)	
0.5	1.2	3	0.3	30	12	-0.5	0.5max	3max	0.5max	110typ		TO-220 (MT-25)	
0.5	1.2	3	0.3	30	12	-0.5	0.5max	3max	0.5max	110typ		TO-3P (MT-100)	
0.5		2	0.2	15	12	-0.2	0.2typ	1typ	0.3typ	60typ	2SA1488	TO-220F (FM20)	
0.5		2	0.2	15	12	-0.2	0.2typ	1typ	0.3typ	60typ	2SA1488A	TO-220F (FM20)	
0.5		2	0.05	15	12	-0.2	0.8typ	3typ	1.2typ	50typ		TO-220F (FM20)	
0.5		2	0.05	15	12	-0.2	0.8typ	3typ	1.2typ	50typ		TO-220F (FM20)	
2.0		5	0.5	20	12	-0.5	0.5typ	1.8typ	0.6typ	300typ	2SA1492	TO-3P (MT-100)	
3.0		10	1	20	12	-0.5	0.3typ	2.4typ	0.4typ	250typ	2SA1493	MT-200	
2.5		10	1	20	12	-1	0.5typ	1.8typ	0.6typ	300typ	2SA1494	MT-200	
0.5	1.2	5	1	6	12	-1	1max	5max	0.5max	105typ		TO-3P (MT-100)	
0.5	1.2	0.7	0.14	6	12	-0.3	1max	5max	1max	40typ		TO-220 (MT-25)	
0.5		5	0.1	24	12	-0.5	0.5typ	2typ	0.5typ	150typ		TO-220F (FM20)	
0.35		6	0.3	40	12	-0.5	0.6typ	1.4typ	0.4typ	180typ	2SA1567	TO-220F (FM20)	
0.5	1.2	5	0.08	18	12	-1	0.5typ	2typ	0.4typ	210typ		TO-3PF (FM100)	
0.5	1.3	6	1.2	10	12	-0.7	1max	3max	0.5max	85typ		TO-3P (MT-100)	
0.5		8	1.6	10	12	-1.5	1max	3max	0.5max	85typ		TO-3P (MT-100)	
0.5	1.3	10	2	10	12	-2.0	1max	3max	0.5max	165typ		TO-3P (MT-100)	
0.5	1.2	3	0.3	30	12	-0.5	0.5max	3max	0.5max	110typ		TO-220F (FM20)	
0.5	1.3	7	1.4	10	12	-1	1max	3max	0.5max	105typ		TO-3PF (FM100)	
0.5	1.3	8	1.6	10	12	-1.5	1max	3max	0.5max	85typ		TO-3PF (FM100)	
0.5	1.2	2	0.4	6	12	-0.5	1max	5max	1max	75typ		TO-3PF (FM100)	
0.5	1.2	3	0.6	6	12	-1	1max	5max	1max	105typ		TO-3PF (FM100)	
0.5	1.2	7	0.14	15	12	-0.3	0.7max	4max	0.7max	50typ		TO-220F (FM20)	
1.0		7	0.07	15	12	-0.2	1typ	3typ	1.5typ	35	2SA1667	TO-220F (FM20)	
1.0		7	0.07	15	12	-0.2	1typ	3typ	1.5typ	35	2SA1668	TO-220F (FM20)	
2.0		5	0.5	20	12	-0.5	0.5max	1.8max	0.6max	300	2SA1673	TO-3PF (FM100)	
0.7	1.3	8	1.6	10	12	-1.5	0.5typ	2typ	0.15typ	135		TO-3P (MT-100)	
0.5	1.2	0.7	0.14	15	12	-0.3	0.7max	4max	0.7max	50		TO-3PF (FM100)	
1.5		2	0.2	20	12	-0.5	0.16typ	2.6typ	0.34typ	110	2SA1693	TO-3P (MT-100)	
1.5		3	0.3	20	12	-0.5	0.13typ	3.5typ	0.32typ	200	2SA1694	TO-3P (MT-100)	
0.5		5	0.5	20	12	-0.5	0.24typ	4.32typ	0.4typ	250	2SA1695	TO-3P (MT-100)	
0.5		4	0.02	40	12	-0.1	0.45typ	1.6typ	0.85typ	30		TO-220F (FM20)	
0.5		2	0.2	20	12	-0.5	0.16typ	2.6typ	0.34typ	110	2SA1725	TO-220F (FM20)	
0.5		5	0.2	20	12	-0.5	0.16typ	2.6typ	0.34typ	110	2SA1726	TO-220 (MT-25)	
0.5	1.2	1.8	0.36	6	12	-0.35	0.7max	4max	0.5max	50		TO-220F (FM20)	
0.5	1.2	1.8	0.36	6	12	-0.35	0.7max	4max	0.5max	50		TO-220F (FM20)	

Part Number	Applications	Absolute Maximum Ratings						hFE					
		V _{CB0}	V _{CEO}	I _c	P _c	I _{CB0}	Conditions	min		max		Conditions	
								min	max	V _{CE}	I _c		
												(V)	(V)
2SC4546	Switching regulator, lighting inverter, general-purpose	600	400	7 (Pulse 14)	30	100	600	10	25	4	3		
2SC4557	Switching regulator, general-purpose	900	550	10 (Pulse 20)	80	100	800	10	28	4	5		
2SC4706	Switching regulator, general-purpose	900	600	14 (Pulse 28)	130	100	800	10	25	4	7		
2SC4883	Audio output driver, TV velocity modulation	150	150	2	20	10	150	60	240	10	0.7		
2SC4883A	Audio output driver, TV velocity modulation	180	180	2	20	10	180	60	240	10	0.7		
2SC4886	Audio, general-purpose	150	150	14	80	100	150	50	180	4	5		
2SC5071	Switching regulator, general-purpose	500	400	12 (Pulse 24)	100	100	500	10	30	4	7		
2SC5099	Audio, general-purpose	120	80	6	60	10	120	50	180	4	2		
2SC5100	Audio, general-purpose	160	120	8	75	10	160	50	180	4	3		
2SC5101	Audio, general-purpose	200	140	10	80	10	200	50	180	4	3		
2SC5130	Switching regulator, general-purpose	600	400	5 (Pulse 10)	30	100	500	10	30	4	1.5		
2SC5287	Switching regulator, general-purpose	900	550	5 (Pulse 10)	80	100	800	10	25	4	1.8		
2SC5333	Series regulator, switch, general-purpose	300	300	2	35	1	300	30		4	0.5		
2SC5586	Switching regulator, general-purpose	900	550	5 (Pulse 10)	70	100	800	10	25	4	1.8		
2SC5830	Switching regulator, lighting inverter, general-purpose	1000	450	8 (Pulse 16)	35	1000	1000	10	30	5	4		
2SC5924	Switching regulator, general-purpose	900	600	14 (Pulse 28)	90	100	800	10	25	4	7		
2SC6011	Audio, general-purpose	200	200	15	160	10	200	50	180	4	3		
2SC6011A	Audio, general-purpose	230	230	15	160	10	230	50	180	4	3		
2SD1769	Solenoid/relay/motor driver/series regulator, general-purpose	120	120	6 (Pulse 10)	50	10	120	2000		2	3		
2SD1785	Solenoid/relay/motor driver/series regulator, general-purpose	120	120	6 (Pulse 10)	30	10	120	2000		2	3		
2SD1796	Solenoid/relay/motor driver, general-purpose	60±10	60±10	4	25	10	50	2000		4	3		
2SD2014	Solenoid/relay/motor driver/series regulator, general-purpose	120	80	4	25	10	120	2000		2	3		
2SD2015	Solenoid/relay/motor driver, general-purpose	150	120	4	25	10	150	2000		2	2		
2SD2016	Igniter, relay, general-purpose	200	200	3	25	10	200	1000	15000	4	1		
2SD2017	Solenoid/relay/motor driver, general-purpose	300	250	6	35	100	300	2000		2	2		
2SD2045	Solenoid/motor driver, general-purpose	120	120	6 (Pulse 10)	50	10	120	2000		2	3		
2SD2081	Solenoid/motor driver, general-purpose	120	120	10 (Pulse 15)	30	10	120	2000		4	5		
2SD2082	Solenoid/motor driver, general-purpose	120	120	16 (Pulse 26)	75	10	120	2000		4	8		
2SD2083	Solenoid/motor driver, general-purpose	120	120	25 (Pulse 40)	120	10	120	2000		4	12		
2SD2141	Igniter, solenoid, motor driver, general-purpose	380±50	380±50	6 (Pulse 10)	35	10	330	1500		2	3		
2SD2389	Audio, series regulator, general-purpose	160	150	8	80	100	160	5000	30000	4	6		
2SD2390	Audio, series regulator, general-purpose	160	150	10	100	100	160	5000	30000	4	7		
2SD2401	Audio, series regulator, general-purpose	160	150	12	150	100	160	5000	30000	4	7		
2SD2438	Audio, series regulator, general-purpose	160	150	8	75	100	160	5000	30000	4	6		
2SD2439	Audio, series regulator, general-purpose	160	150	10	80	100	160	5000	30000	4	7		
2SD2557	Series regulator, general-purpose	200	200	5	70	100	200	1500	6500	5	1		
2SD2558	Series regulator, general-purpose	200	200	5	60	100	200	1500	6500	5	1		
2SD2560	Audio, series regulator, general-purpose	150	150	15	130	100	150	5000	30000	4	10		
2SD2561	Audio, series regulator, general-purpose	150	150	17	200	100	150	5000	30000	4	10		
2SD2562	Audio, series regulator, general-purpose	150	150	15	85	100	150	5000	30000	4	10		
2SD2641	Audio, series regulator, general-purpose	110	110	6	60	100	110	5000	30000	4	5		
2SD2642	Audio, series regulator, general-purpose	110	110	6	30	100	110	5000	30000	4	5		
2SD2643	Audio, series regulator, general-purpose	110	110	6	60	100	110	5000	30000	4	5		
STD03N	Audio	160	160	15	160	100	160	5000	20000	4	10		
STD03P	Audio	-160	-160	-15	160	-100	-160	5000	20000	-4	-10		

Electrical Characteristics												Complementary	Package
V _{CE (sat)}	V _{BE (sat)}	Conditions			f _T	Switching Time			C _{ob}				
(V)	(V)	I _c	I _b	MHz	V _{CE}	I _E	t _{on}	t _{stg}	t _f	(pF)			
max	max	(A)	(A)		(V)	(A)	(μS)	(μS)	(μS)				
0.7	1.3	3	0.6	10	12	-0.5	0.5max	2max	0.15max	55		TO-220F (FM20)	
0.5	1.2	5	1	6	12	-1	1max	5max	0.5max	105		TO-3PF (FM100)	
0.5	1.2	7	1.4	6	12	-1.5	1max	5max	0.7max	160		TO-3P (MT-100)	
1.0		0.7	0.07	120	12	-0.7	0.5typ	1.5typ	0.5typ	30	2SA1859	TO-220F (FM20)	
1.0		0.7	0.07	120	12	-0.7	0.5typ	1.5typ	0.5typ	30	2SA1859A	TO-220F (FM20)	
2.0		5	0.5	60	12	-2	0.26typ	1.5typ	0.35typ	200	2SA1860	TO-3PF (FM100)	
0.5	1.3	7	1.4	10	12	-1	1max	3max	0.5max	105		TO-3P (MT-100)	
0.5		2	0.2	20	12	-0.5	0.16typ	2.6typ	0.34typ	110	2SA1907	TO-3PF (FM100)	
0.5		3	0.3	20	12	-0.5	0.13typ	3.5typ	0.32typ	200	2SA1908	TO-3PF (FM100)	
0.5		5	0.5	20	12	-0.5	0.24typ	4.32typ	0.4typ	250	2SA1909	TO-3PF (FM100)	
0.5	1.3	1.5	0.3	20	12	-0.3	1max	2max	0.3max	30		TO-220F (FM20)	
0.5	1.2	1.8	0.36	6	12	-0.35	0.7max	4max	0.5max	50		TO-3P (MT-100)	
1.0		1	0.2	10	12	-0.2	0.3typ	4typ	1typ	75		TO-220F (FM20)	
0.5	1.2	1.8	0.36	6	12	-0.35	0.7max	4max	0.5max	50		TO-3PF (FM100)	
0.5	1.2	4	0.8	4	12	-0.25	1max	4max	0.4max	95		TO-220F (FM20)	
0.5	1.2	7	1.4	6	12	-1.5	1max	5max	0.7max	160		TO-3PF (FM100)	
0.5		5	0.5	20	12	-0.5	-	-	-	270	2SA2151	TO-3P (MT-100)	
0.5		5	0.5	20	12	-0.5	-	-	-	270	2SA2151A	TO-3P (MT-100)	
1.5	2.0	3	3mA	100	12	-0.2	0.5typ	5.5typ	1.5typ			TO-220 (MT-25)	
1.5		2	3mA	100	12	-0.1	0.5typ	5.5typ	1.5typ	70	2SB1258	TO-220F (FM20)	
1.5		3	10mA	60	12	-0.2	1typ	4typ	1.5typ	45		TO-220F (FM20)	
1.5	2.0	3	3mA	75	12	-0.1	1typ	4typ	1.5typ	45	2SB1257	TO-220F (FM20)	
1.5	2.0	2	2mA	40	12	-0.1	0.6typ	5typ	2typ	40		TO-220F (FM20)	
1.5	2.0	1	1.5mA	90	12	-0.1				40		TO-220F (FM20)	
1.5	2.0	2	2mA	20	12	-1	0.6typ	16typ	3typ	65		TO-220F (FM20)	
1.5	2.0	3	3mA	50	12	-1	0.5typ	5.5typ	1.5typ	70		TO-3PF (FM100)	
1.5	2.0	5	5mA	60	12	-0.5				95	2SB1259	TO-220F (FM20)	
1.5	2.5	8	16mA	20	12	-1	0.6typ	7typ	1.5typ	210	2SB1382	TO-3PF (FM100)	
1.8	2.5	12	24mA	20	12	-1	1typ	6typ	1typ	340	2SB1383	TO-3P (MT-100)	
1.5		4	20mA	20	12	-0.5				95		TO-220F (FM20)	
2.5	3.0	6	6mA	80	12	-1	0.6typ	10typ	0.9typ	85	2SB1559	TO-3P (MT-100)	
2.5	3.0	7	7mA	55	12	-2	0.5typ	10typ	1.1typ	95	2SB1560	TO-3P (MT-100)	
2.5	3.0	7	7mA	55	12	-2	0.5typ	10typ	1.1typ	95	2SB1570	MT-200	
2.5	3.0	6	6mA	80	12	-1	0.6typ	10typ	0.9typ	85	2SB1587	TO-3PF (FM100)	
2.5	3.0	7	7mA	55	12	-2	0.5typ	10typ	1.1typ	95	2SB1588	TO-3PF (FM100)	
1.5		1	5mA	15	10	-0.5				110		TO-3P (MT-100)	
1.5		1	5mA	15	10	-0.5				110		TO-3PF (FM100)	
2.5	3.0	10	10mA	70	12	-2	0.8typ	4typ	1.2typ	120	2SB1647	TO-3P (MT-100)	
2.5	3.0	10	10mA	70	12	-2	0.8typ	4typ	1.2typ	120	2SB1648	MT-200	
2.5	3.0	10	10mA	70	12	-2	0.8typ	4typ	1.2typ	120	2SB1649	TO-3PF (FM100)	
2.5	3.0	5	5mA	60	12	-2	0.8typ	6.2typ	1.1typ	55	2SB1624	TO-3P (MT-100)	
2.5	3.0	5	5mA	60	12	-0.5	0.8typ	6.2typ	1.1typ	55	2SB1626	TO-220F (FM20)	
2.5	3.0	5	5mA	60	12	-0.5	0.8typ	6.2typ	1.1typ	55	2SB1625	TO-3PF (FM100)	
2.0	2.5	10	10mA								STD03P	TO-3P-5pin	
-2.0	-2.5	-10	-10mA								STD03N	TO-3P-5pin	

Selection Guide

By V_{DSS}

V_{DSS} (V)	$R_{DS(ON)}$ (Ω) max	I_D (A)	P_D (W)	Part Number	Package Type
40	6.0m	± 70	80	2SK3800	TO-220S (Surface-mount)
	6.0m	± 70	100	2SK3801	TO-3P (MT100)
	9m	± 60	60	FKV460S	TO-220S (Surface-mount)
50	13m	± 50	35	FKV550T	TO-220F (FM20)
	15m	± 50	35	FKV550N	TO-220F (FM20)
	15m	± 50	85	EKV550	TO-220 (MT25)
60	4.7m	± 85	150	2SK3851 ¹	TO-3P (MT100)
	5.0m	± 80	80	2SK3724 ²	TO-220S (Surface-mount)
	6.0m	± 70	90	2SK3710 ²	TO-220S (Surface-mount)
	6.0m	± 70	130	2SK3711	TO-3P (MT100)
	14m	± 60	60	FKV660S	TO-220S (Surface-mount)
	28m	± 30	40	2SK2420	TO-220F (FM20)
	37m	± 25	35	2SK2419	TO-220F (FM20)
100	0.2	± 10	25	2SK1188	TO-220F (FM20)
	80m	± 20	35	2SK2779	TO-220F (FM20)
	0.175	± 12	30	2SK2778	TO-220F (FM20)
200	53m	± 45	40	FKP202	TO-220F (FM20)
	53m	± 45	95	SKP202	TO-263(Surface-mount)
	0.175	± 18	35	2SK3003	TO-220F (FM20)
	0.35	± 8	30	2SK3002 ²	TO-220F (FM20)
	1.5	± 3	25	2SK1183	TO-220F (FM20)
250	43m	± 50	85	FKP250A	TO-3PF(FM100)
	75m	± 25	40	FKP252	TO-220F(FM20)
	95m	± 20	40	FKP253	TO-220F(FM20)
	95m	± 20	40	SKP253	TO-263(Surface-mount)
	0.25	± 18	35	2SK3004	TO-220F (FM20)
280	53m	± 40	85	FKP280A	TO-3PF(FM100)
300	65m	± 30	85	FKP300A	TO-3PF(FM100)
450	0.38	± 15	80	2SK2805 ²	TO-3PF (FM100)
	0.57	± 13	40	2SK2704	TO-220F (FM20)
	0.80	± 10	35	2SK2702 ²	TO-220F (FM20)
	1.1	± 7	35	2SK2701	TO-220F (FM20)
	2.8	± 3	30	2SK2803	TO-220F (FM20)
500	0.85	± 8.5	85	2SK1179	TO-220F (FM20)
	1.5	± 5	30	2SK3199	TO-220F (FM20)
600	0.55	± 12	85	2SK2710A	TO-3PF (FM100)
	0.85	± 8.5	85	2SK2709 ²	TO-3PF (FM100)
	1.85	± 4.5	35	2SK2707 ²	TO-220F (FM20)
	3.8	± 2	30	2SK2848	TO-220F (FM20)
900	3.0	± 5	35	2SK2945	TO-220F (FM20)
	5.0	± 3	30	2SK2943	TO-220F (FM20)

*Under development

Specifications List by Part Number

Part Number	Absolute Maximum Ratings						I _{GSS}				I _{BSS}		V _{TH}			
	V _{DSS} (V)	V _{GSS} (V)	I _D (A)	I _{D (pulse)} (A)	P _D (W)	E _{AS} (mJ)	Conditions		Conditions		Conditions		V _D (V)	I _D (μA)		
							(nA)	V _{GS} (V)	(μA)	V _{DS} (V)	(V)	(V)				
	max						min	max	min	max	min	max				
2SK1179	500	±20	±8.5	±34	85	400	±500	±20		250	500	2.0	4.0	10	250	
2SK1183	200	±20	±3	±12	25	30	±500	±20		250	200	2.0	4.0	10	250	
2SK1188	60	±20	±10	±40	25	2.1	±500	±20		250	60	2.0	4.0	10	250	
2SK2419	60	±20	±25	±100	35	26	±100	±20		100	60	2.0	4.0	10	250	
2SK2420	60	±20	±30	±120	40	38	±100	±20		100	60	2.0	4.0	10	250	
2SK2701	450	±30	±7	±28	35	130	±100	±30		100	450	2.0	4.0	10	1m	
2SK2702*	450	±30	±10	±40	35	300	±100	±30		100	450	2.0	4.0	10	1m	
2SK2704	450	±30	±13	±52	40	400	±100	±30		100	450	2.0	4.0	10	1m	
2SK2707*	600	±30	±4.5	±18	35	50	±100	±30		100	600	2.0	4.0	10	1m	
2SK2709*	600	±30	±8.5	±34	85	300	±100	±30		100	600	2.0	4.0	10	1m	
2SK2710A	600	±30	±12	±48	85	400	±100	±30		100	600	2.0	4.0	10	1m	
2SK2778	100	±20	±12	±48	30	70	±100	±20		100	100	1.0	2.0	10	250	
2SK2779	100	±20	±20	±80	35	200	±100	±20		100	100	1.0	2.0	10	250	
2SK2803	450	±30	±3	±12	30	30	±100	±30		100	450	2.0	4.0	10	1m	
2SK2805*	450	±30	±15	±60	80	550	±100	±30		100	450	2.0	4.0	10	1m	
2SK2848	600	±30	±2	±8	30	10	±100	±30		100	600	2.0	4.0	10	250	
2SK2943	900	±30	±3	±12	30	60	±100	±30		100	900	2.0	4.0	10	1m	
2SK2945	900	±30	±5	±20	35	120	±100	±30		100	900	2.0	4.0	10	1m	
2SK3002*	200	±20	±8	±32	30	55	±100	±20		100	200	2.0	4.0	10	1m	
2SK3003	200	±20	±18	±72	35	120	±100	±20		100	200	2.0	4.0	10	1m	
2SK3004	250	±20	±18	±72	35	120	±100	±20		100	250	2.0	4.0	10	1m	
2SK3199	500	±30	±5	±20	30	35	±100	±30		100	500	2.0	4.0	10	1m	
2SK3710*	60	±20	±70	±140	90	468	±10μ	±15		100	60	2.0	4.0	10	1m	
2SK3711	60	±20	±70	±140	130		±10μ	±15		100	60	2.0	4.0	10	1m	
2SK3724*	60	±20	±80	±160	80	400	±10μ	±20		100	60	1.0	2.0	10	1m	
2SK3800	40	±20	±70	±140	80	400	±10	±15		100	40	2.0	4.0	10	1m	
2SK3801	40	±20	±70	±140	100	400	±10	±15		100	40	2.0	4.0	10	1m	
2SK3851*	60	±20	±85	±280	150	280	±10μ	±20		100	60	2.0	3.0	10	1m	
EKV550	50	±20	±50	±150	85	150	±10μ	±20		100	50	3.0	4.2	10	250	
FKP202	250	±30	±45	±180	40	200	±100	±30		100	200	3.0	4.5	10	1m	
FKP250A	250	±30	±50	±200	85	400	±100	±30		100	250	3.0	4.5	10	1m	
FKP252	250	±30	±25	±100	40	200	±100	±30		100	250	3.0	4.5	10	1m	
FKP253	250	±30	±20	±80	40	160	±100	±30		100	250	3.0	4.5	10	1m	
FKP280A	280	±30	±40	±160	85	400	±100	±30		100	280	3.0	4.5	10	1m	
FKP300A	300	±30	±30	±120	85	400	±100	±30		100	300	3.0	4.5	10	1m	
FKV460S	40	+20, -10	±60	±180	60		+10, -5μ	+20, -10		100	40	1.0	2.5	10	250	
FKV550T	50	±20	±50	±150	35	150	±10μ	±20		100	50	1.0	2.5	10	250	
FKV550N	50	±20	±50	±150	35	150	±10μ	±20		100	50	3.0	4.2	10	250	
FKV660S	60	+20, -10	±60	±180	60		+10, -5μ	+20, -10		100	60	1.0	2.5	10	250	
SKP202	200	±30	±45	±180	95	200	±100	±30		100	200	3.0	4.5	10	1m	
SKP253	250	±30	±20	±80	40	160	±100	±30		100	250	3.0	4.5	10	1m	

*Under development

Electrical Characteristics																Package
R _e (y/s)		Conditions		C _{iss}	C _{rss}	R _{DS(ON)}										
						Conditions		Conditions		Conditions		Conditions				
(S)		V _{DS}	I _D	(pF)	(pF)	Conditions		(Ω)		Conditions		Conditions				
min	typ	(V)	(A)	typ	typ	V _{GS}	V _{DS}	typ	max	V _{GS}	I _D	typ	max	V _{GS}	I _D	
		(V)	(A)	typ	typ	(V)	(V)	(Ω)	(Ω)	(V)	(A)	(Ω)	(Ω)	(V)	(A)	
5.1	7.7	10	4.5	1300		0	25	0.7	0.85	10	4.5					TO-220F (FM20)
0.8	1.2	10	1.5	140		0	25	1.2	1.5	10	1.5					TO-220F (FM20)
2.2	3.3	10	5	300		0	25	0.15	0.2	10	5					TO-220F (FM20)
10	15	10	12	1300	200	0	25	31m	37m	10	12					TO-220F (FM20)
13	20	10	15	2200		0	25	21m	28m	10	15					TO-220F (FM20)
3.5	5	20	3.5	720	62	0	10	0.84	1.1	10	3.5					TO-220F (FM20)
5	7	20	5	1000	95	0	10	0.66	0.8	10	5					TO-220F (FM20)
6.0	9.0	20	6.5	1300	130	0	10	0.48	0.57	10	6.5					TO-220F (FM20)
2.4	3.5	20	2	560	65	0	10	1.45	1.85	10	2					TO-220F (FM20)
5.0	7.0	20	4	1200	150	0	10	0.65	0.85	10	4					TO-3PF (FM100)
7.5	11	20	6	1900	240	0	10	0.42	0.55	10	6					TO-3PF (FM100)
7	11	10	6	740	75	0	10	105m	175m	10	6	130m	220m	4	6	TO-220F (FM20)
12	20	10	10	1630	180	0	10	60m	80m	10	10	75m	95m	4	10	TO-220F (FM20)
1.5	2.1	20	1.5	340	26	0	10	2.1	2.8	10	1.5					TO-220F (FM20)
8.0	11.5	20	7.5	2100	210	0	10	0.30	0.38	10	7.5					TO-3PF (FM100)
1.2	1.7	20	1	290	30	0	10	3	3.8	10	1					TO-220F (FM20)
1.8	2.8	20	1.5	600	40	0	10	4	5	10	1.5					TO-220F (FM20)
2.0	4.5	20	2.5	880	70	0	10	2.3	3	10	2.5					TO-220F (FM20)
2.5	5.5	10	4	450	120	0	10	0.27	0.35	10	4					TO-220F (FM20)
7	11	10	9	850	250	0	10	130m	175m	10	9					TO-220F (FM20)
7	11	10	9	850	250	0	10	0.2	0.25	10	9					TO-220F (FM20)
3.5	5.2	20	2.5	650	110	0	10	1.2	1.5	10	2.5					TO-220F (FM20)
30	80	10	35	8000	1000	0	10	5m	6m	10	35					TO-220S (Surface-mount)
30	80	10	35	8000	1000	0	10	5m	6m	10	35					TO-3P (MT100)
				10600	1300	0	10	4m	5m	10	40					TO-220S (Surface-mount)
30	50	10	35	5100	860	0	10	5.0	6.0	10	35					TO-220S (Surface-mount)
30	50	10	35	5100	860	0	10	5.0	6.0	10	35					TO-3P (MT100)
30		10	42	11500	1100	0	10	4m	4.7m	10	42					TO-3P (MT100)
17		10	25	2000	500	0	10	12m	15m	10	25					TO-220 (MT25)
18	28	10	22	2000	80	0	25	45m	53m	10	22					TO-220F (FM20)
30	42	10	25	3800	210	0	25	37m	43m	10	25					TO-3PF (FM100)
13	21	10	12	2000	70	0	25	68m	75m	10	12					TO-220F (FM20)
8	17	10	10	1600	50	0	25	86m	95m	10	10					TO-220F (FM20)
25	38	10	20	3800	190	0	25	46m	53m	10	20					TO-3PF (FM100)
20	33	10	15	3800	180	0	25	57m	65m	10	15					TO-3PF (FM100)
20		10	25	2800	600	0	10	7m	9m	10	25					TO-220S (Surface-mount)
20		10	25	2700	500	0	10	10m	13m	10	25					TO-220F (FM20)
17		10	25	2000	500	0	10	12m	15m	10	25					TO-220F (FM20)
20		10	25	2500	150	0	10	11m	14m	10	25					TO-220S (Surface-mount)
18	28	10	22	2000	80	0	25	45m	53m	10	22					TO-263 (Surface-mount)
8	17	10	10	1600	50	0	25	88m	95m	10	10					TO-263 (Surface-mount)

2-3 Transistors and MOS FETs Arrays

Specifications List by Part Number

Part Number	Category	Circuit Count	V _{CEO} - V _{DSS} (V)	IC - ID (A)	hFE (min)	R _{DS(ON)} max(Ω)	Package
SDA01	For source driver	4	-60	-1.5	2000		PS16 (Surface-Mount)
SDA05	For 3-phase motor driver	3	-60	-4	2000		PS16 (Surface-Mount)
SDC03	For sink driver	4	60±10	1.5	2000		PS16 (Surface-Mount)
SDC04	For sink driver	4	100±15	1.5	2000		PS16 (Surface-Mount)
SDC06	For sink driver	4	30 to 45	2	400		PS16 (Surface-Mount)
SDC07	For 3-phase motor driver	3	60	4	2000		PS16 (Surface-Mount)
SDH02	For sink driver	4	100	1.5	2000		PS16 (Surface-Mount)
SDH03	H bridge	4	+100/-60	±1.5	2000		PS16 (Surface-Mount)
SDK04	For sink driver	4	100	2		0.8	PS16 (Surface-Mount)
SLA4010	For sink driver	4	60±10	4	2000		SIP12 with Fin (SLA12Pin)
SLA4030	For sink driver	4	100	4	2000		SIP12 with Fin (SLA12Pin)
SLA4031	For sink driver	4	120	4	2000		SIP12 with Fin (SLA12Pin)
SLA4041	For sink driver	4	200	3	1000		SIP12 with Fin (SLA12Pin)
SLA4051	For sink driver	9	120	2	2000		SIP21 with Fin (SLA21Pin)
SLA4052	For sink driver	9	120	3	2000		SIP21 with Fin (SLA21Pin)
SLA4060	For sink driver	4	120	5	2000		SIP12 with Fin (SLA12Pin)
SLA4061	For sink driver	4	120	5	2000		SIP12 with Fin (SLA12Pin)
SLA4070	For source driver	4	-100	-5	1000		SIP12 with Fin (SLA12Pin)
SLA4071	For source driver	4	-100	-5	2000		SIP12 with Fin (SLA12Pin)
SLA4310	H bridge	4	±60	±4	80		SIP12 with Fin (SLA12Pin)
SLA4340	H bridge	4	±60	±4	2000		SIP12 with Fin (SLA12Pin)
SLA4390	H bridge	4	±100	±5	2000		SIP12 with Fin (SLA12Pin)
SLA4391	H bridge	4	±100	±5	1000		SIP12 with Fin (SLA12Pin)
SLA5001	For sink driver	4	100	5		0.3	SIP12 with Fin (SLA12Pin)
SLA5002	For sink driver	4	100	5		0.3	SIP12 with Fin (SLA12Pin)
SLA5007	H bridge	4	±60	+5/-4		0.22/0.55	SIP12 with Fin (SLA12Pin)
SLA5011	For sink driver	5	60	5		0.22	SIP12 with Fin (SLA12Pin)
SLA5012	For source driver	5	-60	-5		0.3	SIP12 with Fin (SLA12Pin)
SLA5013	H bridge	4	±100	±5		0.3/0.7	SIP12 with Fin (SLA12Pin)
SLA5015	For source driver	5	-60	-4		0.55	SIP12 with Fin (SLA12Pin)
SLA5017	For 3-phase motor driver	6	±60	+5/-4		0.22/0.55	SIP12 with Fin (SLA12Pin)
SLA5022	For 3-phase motor driver	6	±60	±6	2000	0.22	SIP12 with Fin (SLA12Pin)
SLA5023	For 3-phase motor driver	6	±100	±6	2000	0.55	SIP12 with Fin (SLA12Pin)
SLA5024	For source driver	4	-60	-4		0.55	SIP12 with Fin (SLA12Pin)
SLA5037	For sink driver	4	100	10		0.08	SIP12 with Fin (SLA12Pin)
SLA5040	For sink driver	4	100	4		0.6	SIP12 with Fin (SLA12Pin)
SLA5041	For sink driver	4	200	10		0.175	SIP12 with Fin (SLA12Pin)
SLA5044	For sink driver	4	250	10		0.25	SIP12 with Fin (SLA12Pin)
SLA5049	For sink driver	5	250	7		0.5	SIP12 with Fin (SLA12Pin)
SLA5058	For sink driver	5	150	±7		0.2	SIP12 with Fin (SLA12Pin)
SLA5059	For 3-phase motor driver	6	±60	±4		0.55	SIP12 with Fin (SLA12Pin)
SLA5060	For 3-phase motor driver	6	±60	±6		0.22	SIP12 with Fin (SLA12Pin)
SLA5061	For 3-phase motor driver	6	±60	±10		0.14	SIP12 with Fin (SLA12Pin)
SLA5064	For 3-phase motor driver	6	±60	±10		0.14	SIP12 with Fin (SLA12Pin)
SLA5065	For 5-phase motor driver	4	60	7		0.1	SIP15 with Fin (SLA15Pin)
SLA5068	For 5-phase motor driver	6	60	7		0.1	SIP15 with Fin (SLA15Pin)
SLA5072	For 3-phase motor driver	6	250	7		0.5	SIP15 with Fin (SLA15Pin)
SLA5073	For 5-phase motor driver	6	60	5		0.3	SIP15 with Fin (SLA15Pin)
SLA5074	For 5-phase motor driver	4	60	5		0.3	SIP15 with Fin (SLA15Pin)
SLA5075	For 3-phase motor driver	6	500	±5		1.4	SIP15 with Fin (SLA15Pin)
SLA5077	For sink driver	4	150	±10		0.2	SIP12 with Fin (SLA12Pin)
SLA5085	For sink driver	5	60	5		0.22	SIP12 with Fin (SLA12Pin)
SLA5086	For source driver	5	-60	-5		0.22	SIP12 with Fin (SLA12Pin)
SLA5094	For sink driver	5	200	7		0.35	SIP12 with Fin (SLA12Pin)
SLA5096	For 3-phase motor driver	6	55	8		0.08	SIP15 with Fin (SLA15Pin)

Part Number	Category	Circuit Count	$V_{CE0} \cdot V_{DSS}$ (V)	IC · ID (A)	hFE (min)	$R_{DS(ON)}$ max(Ω)	Package
SLA5201	For 3-phase motor driver	6	600	7		1.85typ	SIP15 with Fin (SLA15Pin)
SLA6012	For 3-phase motor driver	6	± 60	± 4	2000		SIP12 with Fin (SLA12Pin)
SLA6020	For 3-phase motor driver	6	± 100	± 5	2000		SIP12 with Fin (SLA12Pin)
SLA6022	For 3-phase motor driver	6	± 80	± 5	2000		SIP12 with Fin (SLA12Pin)
SLA6023	For 3-phase motor driver	6	± 60	± 6	2000		SIP12 with Fin (SLA12Pin)
SLA6024	For 3-phase motor driver	6	± 60	± 8	2000		SIP12 with Fin (SLA12Pin)
SLA6026	For 3-phase motor driver	6	± 60	± 10	2000		SIP12 with Fin (SLA12Pin)
SLA8001	H bridge	4	± 60	± 12	50		SIP12 with Fin (SLA12Pin)
SMA4020	For source driver	4	-60	-4	2000		SIP12 (SMA12Pin)
SMA4021	For source driver	4	-60	-3	2000		SIP12 (SMA12Pin)
SMA4030	For sink driver	4	100	3	2000		SIP12 (SMA12Pin)
SMA4032	For sink driver	4	100	3	2000		SIP12 (SMA12Pin)
SMA4033	For sink driver	4	100	2	2000		SIP12 (SMA12Pin)
SMA4036	For sink driver	6	120	2	2000		SIP15 (SMA15Pin)
SMA5101	For sink driver	4	100	4		0.6	SIP12 (SMA12Pin)
SMA5102	For sink driver	4	100	4		0.6	SIP12 (SMA12Pin)
SMA5103	H bridge	4	± 60	+5/-4		0.22/0.55	SIP12 (SMA12Pin)
SMA5106	For sink driver	4	100	4		0.55	SIP12 (SMA12Pin)
SMA5112	For 3-phase motor driver	6	250	7		0.5	SIP12 (SMA12Pin)
SMA5117	For 3-phase motor driver	6	250	7		0.25	SIP12 (SMA12Pin)
SMA5118	For 3-phase motor driver	6	500	± 5		1.4	SIP12 (SMA12Pin)
SMA5125	For 3-phase motor driver	6	± 60	± 10		0.14	SIP12 (SMA12Pin)
SMA5127	For 3-phase motor driver	6	± 60	± 4		0.55	SIP12 (SMA12Pin)
SMA5130	For 3-phase motor driver	6	250	2.5	2000	0.9	SIP15 (SMA15Pin)
SMA5131	For 3-phase motor driver	6	250	2		1.8	SIP12 (SMA12Pin)
SMA5132	For 3-phase motor driver	6	500	1.5		4	SIP12 (SMA12Pin)
SMA5133	For 3-phase motor driver	6	500	2.5		2	SIP12 (SMA12Pin)
SMA6010	For 3-phase motor driver	6	± 60	± 4	2000		SIP12 (SMA12Pin)
SMA6014	For 3-phase motor driver	6	± 60	± 2	1500/2000		SIP12 (SMA12Pin)
SMA6080	For 3-phase motor driver	6	± 60	± 2	2000		SIP12 (SMA12Pin)
SMA6511	For driving stepping motor with two supplies	5	100 \pm 15/-60	1.5/-3	2000		SIP12 (SMA12Pin)
SMA6512	For driving stepping motor with two supplies	5	60 \pm 10/-60	1.5/-3	2000		SIP12 (SMA12Pin)
STA301A	For sink driver	3	60 \pm 10	4	1000		SIP8 (STA8Pin)
STA302A	For source driver/3-phase motor driver	3	-50	-4	1000		SIP8 (STA8Pin)
STA303A	For sink driver/3-phase motor driver	3	100	4	1000		SIP8 (STA8Pin)
STA308A	For source driver/3-phase motor driver	3	-120	-4	2000		SIP8 (STA8Pin)
STA309A	For source driver/3-phase motor driver	3	-250	-2.5	1000		SIP8 (STA8Pin)
STA312A	For sink driver	3	60	3	300		SIP8 (STA8Pin)
STA322A	For source driver	3	-50	-3	100		SIP8 (STA8Pin)
STA351A	For sink driver/3-phase motor driver	3	100	5	1000		SIP8 (STA8Pin)
STA352A	For source driver/3-phase motor driver	3	-100	-5	1000		SIP8 (STA8Pin)
STA371A	For sink driver	3	60 \pm 10	2	2000		SIP8 (STA8Pin)
STA401A	For sink driver	4	60 \pm 10	4	1000		SIP10 (STA10Pin)
STA402A	For source driver	4	-50	-4	1000		SIP10 (STA10Pin)
STA403A	For sink driver	4	100	4	1000		SIP10 (STA10Pin)
STA404A	For sink driver	4	200	3	1000		SIP10 (STA10Pin)
STA406A	For sink driver	4	60 \pm 10	6	2000		SIP10 (STA10Pin)
STA408A	For source driver	4	-120	-4	2000		SIP10 (STA10Pin)
STA412A	For sink driver	4	60	3	300		SIP10 (STA10Pin)
STA413A	For sink driver	4	35 \pm 5	3	500		SIP10 (STA10Pin)
STA421A	For source driver	4	-60	-3	40		SIP10 (STA10Pin)
STA431A	H bridge	4	± 60	± 3	40		SIP10 (STA10Pin)
STA434A	H bridge	4	± 60	± 4	1000		SIP10 (STA10Pin)
STA435A	For sink driver	4	65 \pm 15	4	1000		SIP10 (STA10Pin)
STA457C	H bridge	4	± 60	± 4	2000		SIP10 (STA10Pin)

Part Number	Category	Circuit Count	$V_{CE0} \cdot V_{DSS}$ (V)	IC · ID (A)	hFE (min)	$R_{DS(ON)}$ max(Ω)	Package
STA458C	H bridge	4	± 30	± 5	40		SIP10 (STA10Pin)
STA460C	For sink driver	2	60 ± 10	6	700		SIP10 (STA10Pin)
STA471A	For sink driver	4	60 ± 10	2	2000		SIP10 (STA10Pin)
STA472A	For source driver	4	-60	-2	2000		SIP10 (STA10Pin)
STA473A	For sink driver	4	100	2	2000		SIP10 (STA10Pin)
STA475A	For sink driver	4	100 ± 15	2	2000		SIP10 (STA10Pin)
STA481A	For sink driver	4	60 ± 10	1	2000		SIP10 (STA10Pin)
STA485A	For sink driver	4	100 ± 15	1	2000		SIP10 (STA10Pin)
STA491A	H bridge	4	± 20	± 7	80		SIP10 (STA10Pin)
STA492A	Half bridge	2	± 20	± 7	80		SIP10 (STA10Pin)
STA513A	For sink driver/3-phase motor driver	3	250	3.5		0.9	SIP10 (STA10Pin)
STA517A	For sink driver/3-phase motor driver	3	305	3		1.8	SIP10 (STA10Pin)
STA521A	For sink driver	4	200	± 7		0.35	SIP10 (STA10Pin)
STA524A	For sink driver	3	200	± 7		0.35	SIP10 (STA10Pin)

Specifications List by Application Sink Driver Arrays
● Built-in Avalanche Diodes, between Collector and Base

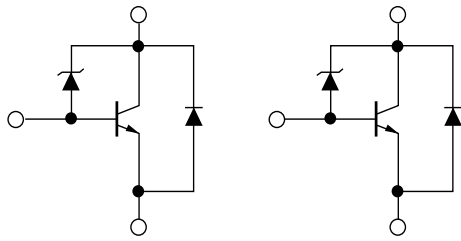
Part Number	Circuit Count	V _{CE0} (V)/ V _{BSS} (V)	I _C (A)/ I _D (A)	h _{FE} (min)	R _{DS(ON)} max (Ω)	Equivalent Circuit	Package
STA460C	2	60±10	6	700		1	SIP10 (STA10Pin)
STA371A	3	60±10	2	2000		2	SIP8 (STA8Pin)
STA301A	3	60±10	4	1000		2	SIP8 (STA8Pin)
SDC06	4	30 to 45	2	400		3	PS16 (Surface-Mount)
STA413A	4	35±5	3	500		4	SIP10 (STA10Pin)
STA481A	4	60±10	1	2000		5	SIP10 (STA10Pin)
SDC03	4	60±10	1.5	2000		6	PS16 (Surface-Mount)
STA471A	4	60±10	2	2000		5	SIP10 (STA10Pin)
STA401A	4	60±10	4	1000		5	SIP10 (STA10Pin)
SLA4010	4	60±10	4	2000		6	SIP12 with Fin (SLA12Pin)
STA406A	4	60±10	6	2000		5	SIP10 (STA10Pin)
STA435A	4	65±15	4	1000		7	SIP10 (STA10Pin)
STA485A	4	100±15	1	2000		5	SIP10 (STA10Pin)
SDC04	4	100±15	1.5	2000		6	PS16 (Surface-Mount)
STA475A	4	100±15	2	2000		5	SIP10 (STA10Pin)

● Built-in Flywheel Diodes

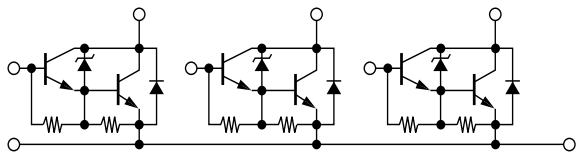
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SDH02	4	100	1.5	2000		9	PS16 (Surface-Mount)
SMA4033	4	100	2	2000		10	SIP12 (SMA12Pin)
SMA4032	4	100	3	2000		10	SIP12 (SMA12Pin)
SLA5040	4	100	4		0.6	8	SIP12 with Fin (SLA12Pin)
SMA5102	4	100	4		0.6	8	SIP12 (SMA12Pin)
SMA5106	4	100	4		0.55	8	SIP12 (SMA12Pin)
SLA5002	4	100	5		0.3	8	SIP12 with Fin (SLA12Pin)
SLA4031	4	120	4	2000		10	SIP12 with Fin (SLA12Pin)
SLA4061	4	120	5	2000		10	SIP12 with Fin (SLA12Pin)
SLA4041	4	200	3	1000		10	SIP12 with Fin (SLA12Pin)
SMA4036	6	120	2	2000		11	SIP15 (SMA15Pin)
SLA4051	9	120	2	2000		12	SIP12 with Fin (SLA12Pin)
SLA4052	9	120	3	2000		12	SIP12 with Fin (SLA12Pin)

●Equivalent Circuit (for Sink Driver)

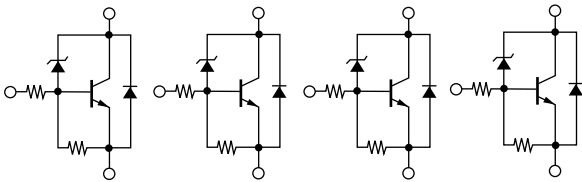
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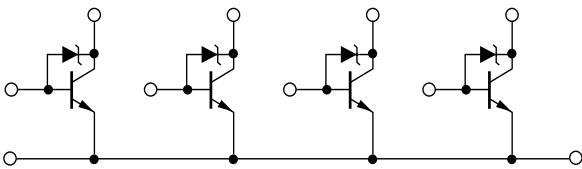
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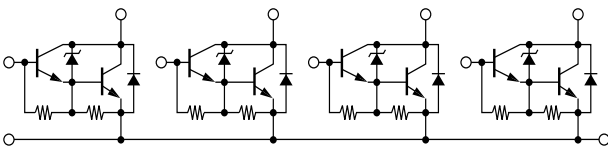
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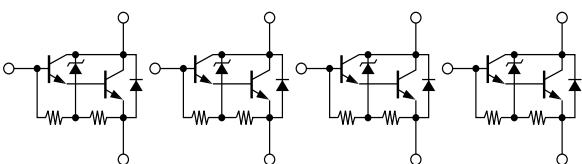
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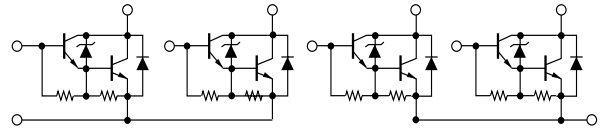
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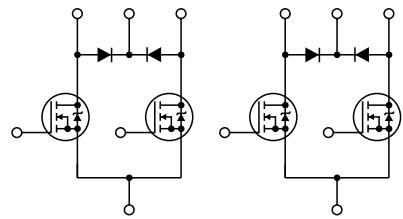
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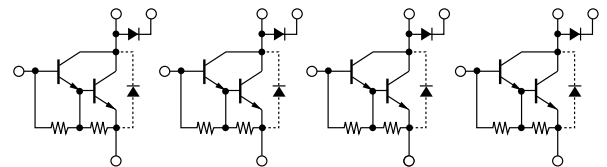
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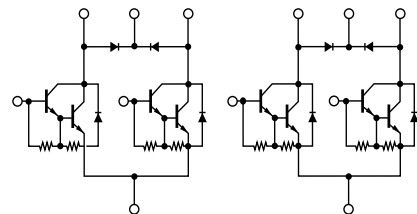
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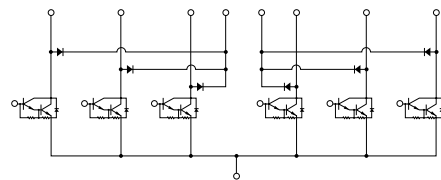
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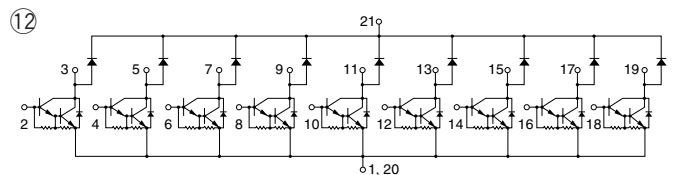
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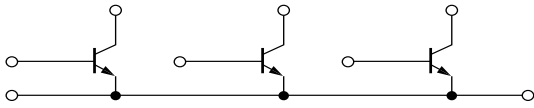


● General-Purpose

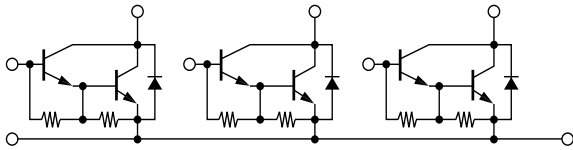
Part Number	Circuit Count	V _{CE0} (V)/ V _{DSS} (V)	I _C (A)/ I _D (A)	h _{FE} (min)	R _{DS(ON)} max (Ω)	Equivalent Circuit	Package
STA312A	3	60	3	300		13	SIP8 (STA8Pin)
STA303A	3	100	4	100		14	SIP8 (STA8Pin)
STA524A	3	200	7		0.35	21	SIP10 (STA10Pin)
STA412A	4	60	3	300		15	SIP10 (STA10Pin)
STA473A	4	100	2	2000		16	SIP10 (STA10Pin)
SDK04	4	100	2		0.8	17	PS16 (Surface-Mount)
SMA4030	4	100	3	2000		18	SIP12 (SMA12Pin)
STA403A	4	100	4	1000		16	SIP10 (STA10Pin)
SLA4030	4	100	4	2000		18	SIP12 with Fin (SLA12Pin)
SMA5101	4	100	4		0.6	17	SIP12 (SMA12PIN)
SLA5001	4	100	5		0.3	17	SIP12 with Fin (SLA12Pin)
SLA5037	4	100	10		0.08	17	SIP12 with Fin (SLA12Pin)
SLA4060	4	120	5	2000		18	SIP12 with Fin (SLA12Pin)
SLA5077	4	150	±10		0.2	17	SIP12 with Fin (SLA12Pin)
STA404A	4	200	3	1000		16	SIP10 (STA10Pin)
STA521A	4	200	7		0.35	20	SIP10 (STA10Pin)
SLA5041	4	200	10		0.175	17	SIP10 (STA10Pin)
SLA5044	4	250	10		0.25	17	SIP12 with Fin (SLA12Pin)
SLA5011	5	60	5		0.22	19	SIP12 with Fin (SLA12Pin)
SLA5085	5	60	5		0.22	19	SIP12 with Fin (SLA12Pin)
SLA5058	5	150	±7		0.2	19	SIP12 with Fin (SLA12Pin)
SLA5094	5	200	7		0.35	19	SIP12 with Fin (SLA12Pin)
SLA5049	5	250	±7		0.5	19	SIP12 with Fin (SLA12Pin)

●Equivalent Circuit (for Sink Driver)

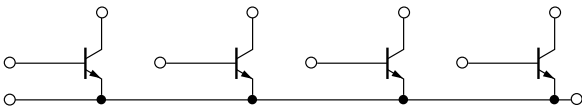
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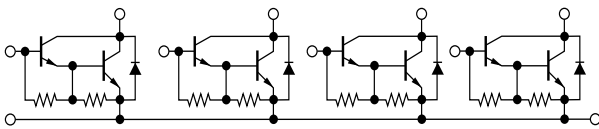
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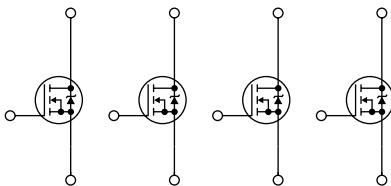
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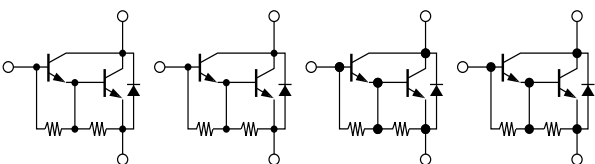
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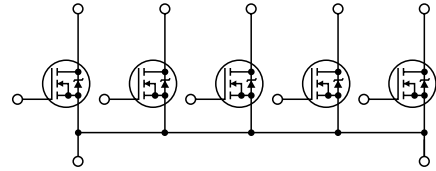
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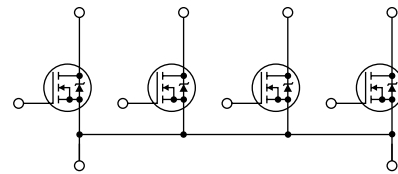
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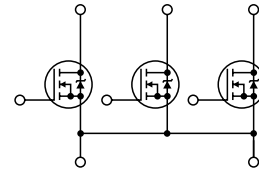
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Specifications List by Application Source Driver Arrays

● Built-in Flywheel Diodes

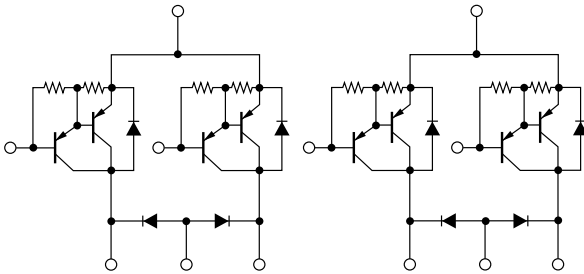
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SMA4021	4	-60	-3	2000		1	SIP12 (SMA12Pin)
SLA4071	4	-100	-5	2000		1	SIP12 with Fin (SLA12Pin)

● General-Purpose

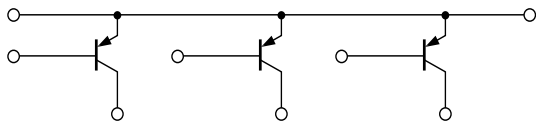
Part Number	Circuit Count	V _{CEO} (V)/ V _{DSS} (V)	I _c (A)/ I _D (A)	h _{FE} (min)	R _{DS(ON)} max (Ω)	Equivalent Circuit	Package
STA322A	3	-50	-3	100		3	SIP8 (STA8Pin)
STA302A	3	-50	-4	1000		4	SIP8 (STA8Pin)
STA308A	3	-120	-4	2000		4	SIP8 (STA8Pin)
STA402A	4	-50	-4	1000		5	SIP10 (STA10Pin)
SDA01	4	-60	-1.5	2000		6	PS16 (Surface-Mount)
STA472A	4	-60	-2	2000		5	SIP10 (STA10Pin)
STA421A	4	-60	-3	40		7	SIP10 (STA10Pin)
SMA4020	4	-60	-4	2000		6	SIP12 (SMA12Pin)
SLA5024	4	-60	-4		0.55	8	SIP12 with Fin (SLA12Pin)
SLA4070	4	-100	-5	1000		6	SIP12 with Fin (SLA12Pin)
STA408A	4	-120	-4	2000		9	SIP10 (STA10Pin)
SLA5015	5	-60	-4		0.55	10	SIP12 with Fin (SLA12Pin)
SLA5012	5	-60	-5		0.3	10	SIP12 with Fin (SLA12Pin)
SLA5086	5	-60	-5		0.22	10	SIP12 with Fin (SLA12Pin)

●Equivalent Circuit (for Source Driver)

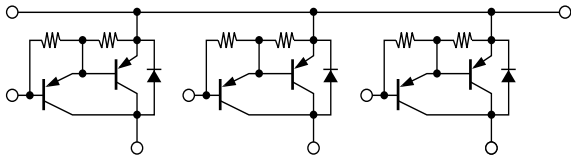
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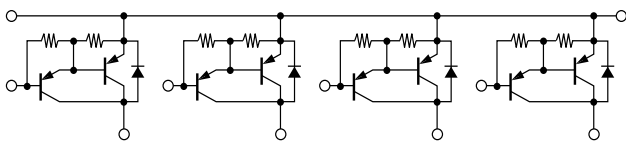
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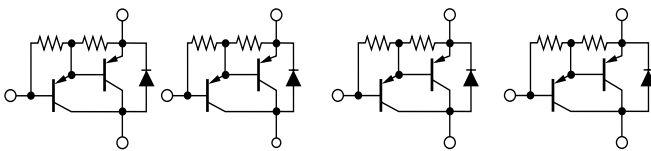
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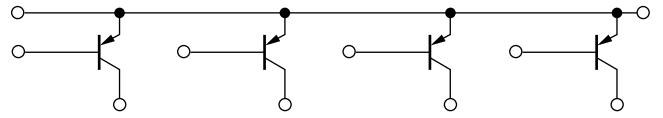
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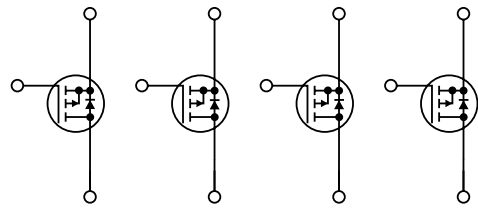
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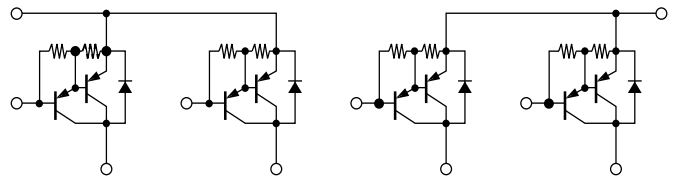
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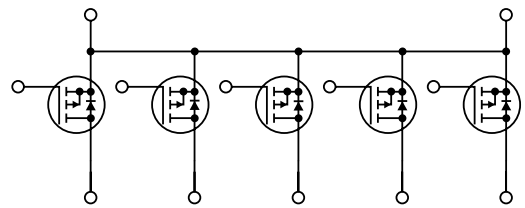
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⑨



⑩



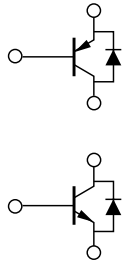
Specifications List by Application Motor Driver Arrays

●H Bridge

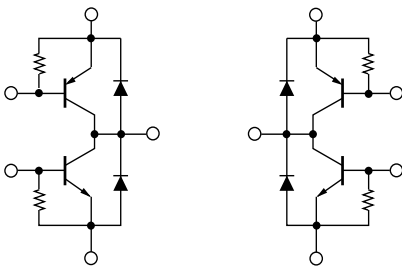
Part Number	Circuit Count	V _{CE0} (V)/ V _{DSS} (V)	I _C (A)/ I _D (A)	h _{FE} (min)	R _{DS(ON)} max (Ω)	Equivalent Circuit	Package
STA492A	2	±20	±7	45		1	SIP10 (STA10Pin)
STA458C	4	±30	±5	40		2	SIP10 (STA10Pin)
STA431A	4	±60	±3	40		3	SIP10 (STA10Pin)
STA434A	4	±60	±4	1000		4	SIP10 (STA10Pin)
STA457C	4	±60	±4	2000		5	SIP10 (STA10Pin)
SLA4310	4	±60	±4	80		6	SIP12 with Fin (SLA12Pin)
SLA4340	4	±60	±4	2000		4	SIP12 with Fin (SLA12Pin)
SLA5007	4	±60	+5/-4		0.22/0.55	7	SIP12 with Fin (SLA12Pin)
SMA5103	4	±60	+5/-4		0.22/0.55	7	SIP12 (SMA12Pin)
SLA8001	4	±60	±12	50		2	SIP12 with Fin (SLA12Pin)
SDH03	4	+100/-60	±1.5	2000		8	PS16 (Surface-Mount)
SLA4390	4	±100	±5	2000		4	SIP12 with Fin (SLA12Pin)
SLA4391	4	±100	±5	1000		9	SIP12 with Fin (SLA12Pin)
SLA5013	4	±100	±5		0.3/0.7	7	SIP12 with Fin (SLA12Pin)
STA491A	4	±20	±7	45		10	SIP10 (STA10Pin)

●Equivalent Circuit (for Motor Driver)

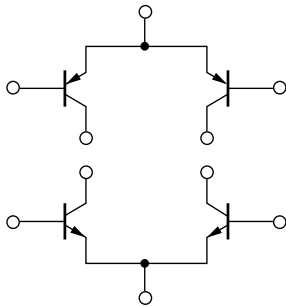
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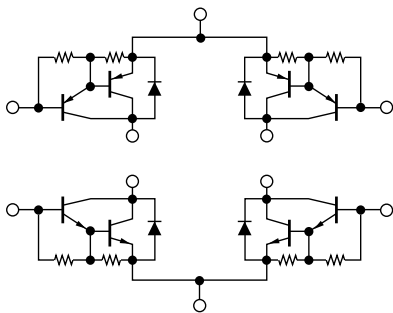
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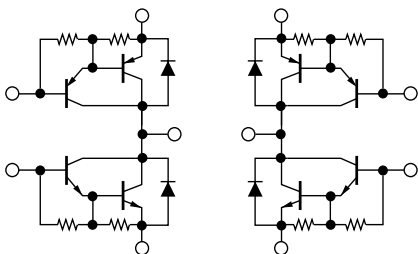
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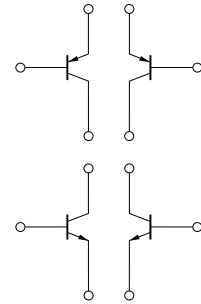
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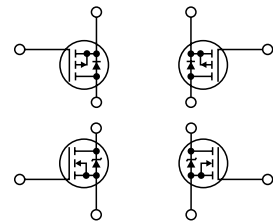
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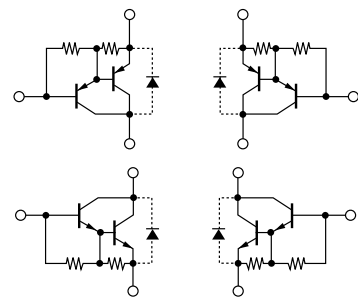
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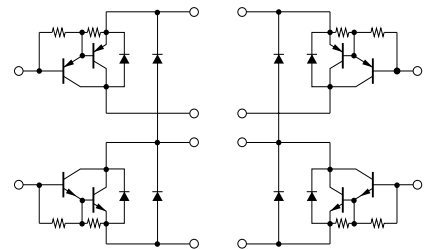
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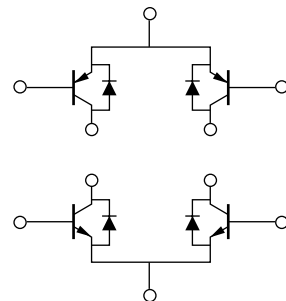
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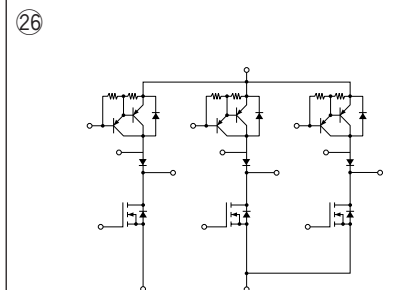
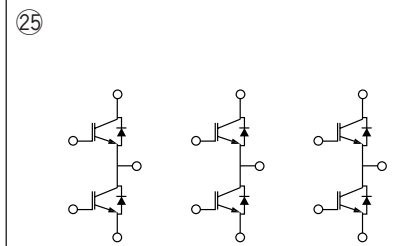
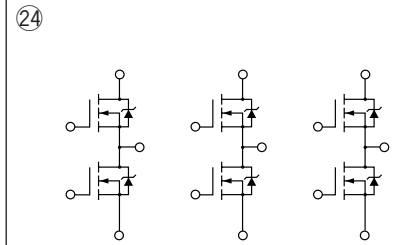
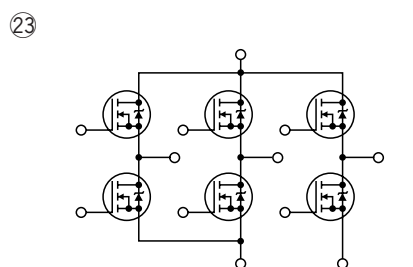
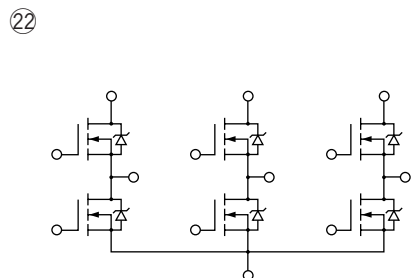
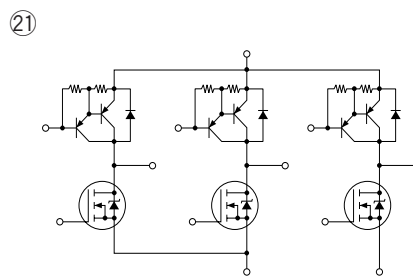
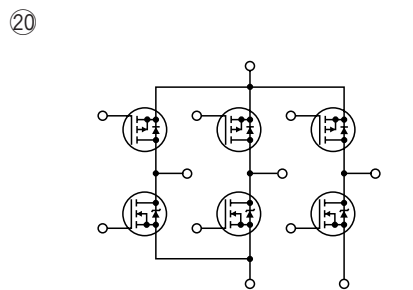
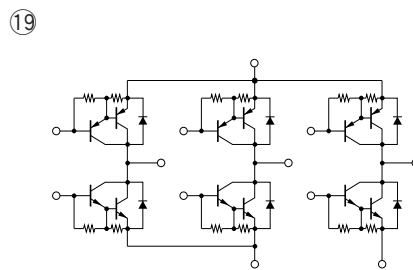
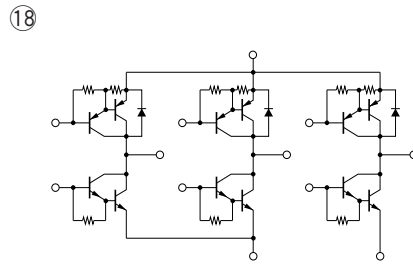
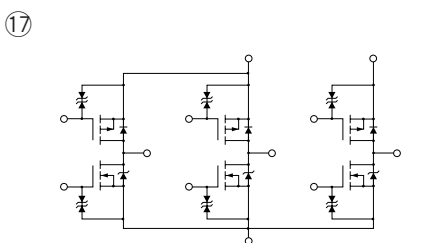
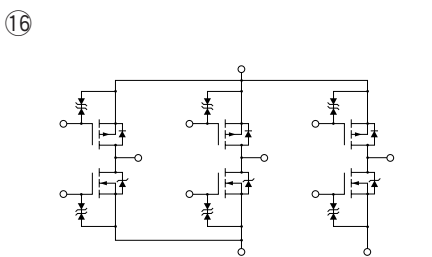
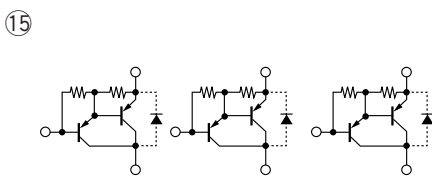
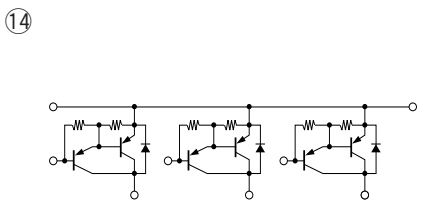
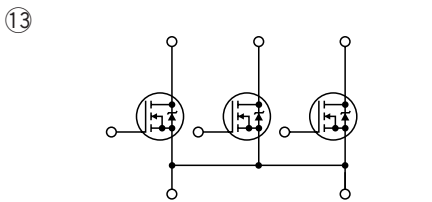
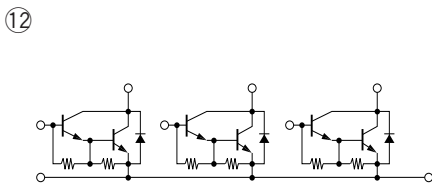
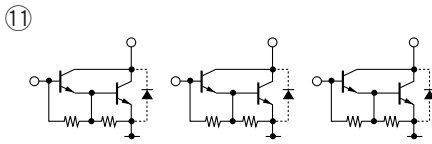
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●For 3-Phase Motor Drivers

Part Number	Circuit Count	V _{CE0} (V)/ V _{BSS} (V)/ V _{CEs} (V)	I _c (A)/ I _b (A)	h _{FE} (min)	R _{Ds(ON)} max (Ω)	Equivalent Circuit	Package
SDC07	3	60	4	2000		11	PS16 (Surface-Mount)
STA303A	3	100	4	1000		12	SIP8 (STA8Pin)
STA351A	3	100	5	1000		12	SIP8 (STA8Pin)
STA513A	3	250	3.5		0.9	13	SIP10 (STA10Pin)
STA517A	3	305	3		1.8	13	SIP10 (STA10Pin)
STA302A	3	-50	-4	1000		14	SIP8 (STA8Pin)
SDA05	3	-60	-4	2000		15	PS16 (Surface-Mount)
STA352A	3	-100	-5	1000		14	SIP8 (STA8Pin)
STA309A	3	-250	-2.5	1000		14	SIP8 (STA8Pin)
SLA5096	6	55	±8		80m	24	SIP15 with Fin (SLA15Pin)
SLA5059	6	60	±4		0.55	16	SIP12 with Fin (SLA12Pin)
SLA5060	6	60	±6		0.22	16	SIP12 with Fin (SLA12Pin)
SLA5061	6	60	±10		0.14	16	SIP12 with Fin (SLA12Pin)
SLA5064	6	60	±10		0.14	17	SIP12 with Fin (SLA12Pin)
SMA6014	6	±60	±2	1500/2000		18	SIP12 (SMA12Pin)
SMA6080	6	±60	±2	2000		19	SIP12 (SMA12Pin)
SMA6010	6	±60	±4	2000		19	SIP12 (SMA12Pin)
SLA6012	6	±60	±4	2000		18	SIP12 with Fin (SLA12Pin)
SMA5127	6	±60	±4		0.55	16	SIP12 (SMA12Pin)
SLA5017	6	±60	+5/-4		0.22/0.55	20	SIP12 with Fin (SLA12Pin)
SLA5022	6	±60	±6	2000	0.22	21	SIP12 with Fin (SLA12Pin)
SLA6023	6	±60	±6	2000		18	SIP12 with Fin (SLA12Pin)
SLA6024	6	±60	±8	2000		18	SIP12 with Fin (SLA12Pin)
SLA6026	6	±60	±10	2000		18	SIP12 with Fin (SLA12Pin)
SMA5125	6	±60	±10		0.14	17	SIP12 (SMA12Pin)
SLA6022	6	±80	±5	2000		18	SIP12 with Fin (SLA12Pin)
SLA6020	6	±100	±5	2000		19	SIP12 with Fin (SLA12Pin)
SLA5023	6	±100	±6	2000	0.55	21	SIP12 with Fin (SLA12Pin)
SMA5130	6	±250	±2.5	2000	0.9	26	SIP15 (SMA15Pin)
SMA5131	6	250	2		1.8	23	SIP12 (SMA12Pin)
SLA5072	6	250	7		0.5	22	SIP15 with Fin (SLA15Pin)
SMA5112	6	250	7		0.5	23	SIP12 (SMA12Pin)
SMA5117	6	250	7		0.25	23	SIP12 (SMA12Pin)
SMA5132	6	500	1.5		4	23	SIP12 (SMA12Pin)
SMA5133	6	500	2.5		2	23	SIP12 (SMA12Pin)
SLA5075	6	500	±5		1.4	22	SIP15 with Fin (SLA15Pin)
SMA5118	6	500	±5		1.4	23	SIP12 (SMA12Pin)
SLA5201	6	600	7			25	SIP15 with Fin (SLA15Pin)

●Equivalent Circuit (for Motor Driver)



●For Driving Stepping Motor with Two Supplies

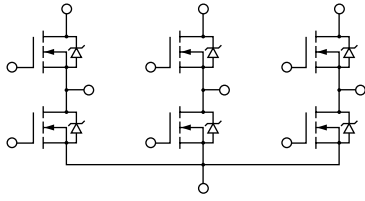
Part Number	Circuit Count	V _{CE0} (V)/ V _{bss} (V)	I _c (A)/ I _D (A)	h _{FE} (min)	R _{Ds(ON)} max (Ω)	Equivalent Circuit	Package
SMA6511	5	100±15/-60	1.5/-3	2000		27	SIP12 (SMA12Pin)
SMA6512	5	60—10/-60	1.5/-3	2000		27	SIP12 (SMA12Pin)

●For 5-Phase Motor Drive

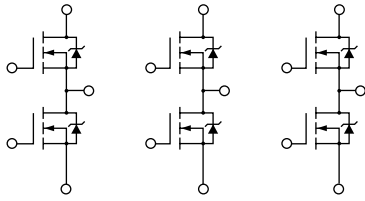
Part Number	Circuit Count	V _{CE0} (V)/ V _{bss} (V)	I _c (A)/ I _D (A)	h _{FE} (min)	R _{Ds(ON)} max (Ω)	Equivalent Circuit	Package
SLA5074	4	60	5		0.3	28	SIP15 with Fin (SLA15Pin)
SLA5065	4	60	7		0.1	28	SIP15 with Fin (SLA15Pin)
SLA5073	6	60	5		0.3	24	SIP15 with Fin (SLA15Pin)
SLA5068	6	60	7		0.1	22	SIP15 with Fin (SLA15Pin)

●Equivalent Circuit (for Motor Driver)

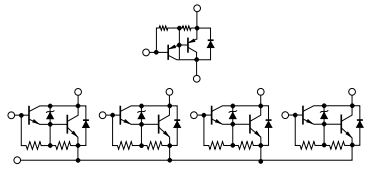
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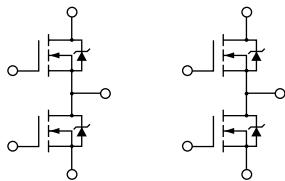
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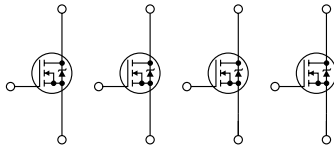


Specifications List by Application Arrays for CRT Monitor S-Distortion Correction Circuit

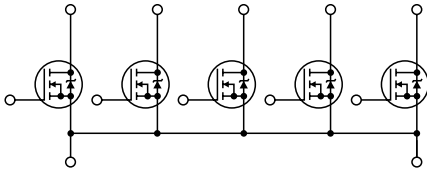
Part Number	V _{DS}	Circuit Count	I _D (A)	R _{DS(ON)max} (Ω)	Equivalent Circuit	Package
SLA5037	100	4	10	0.08	1	SIP12 with Fin (SLA12Pin)
SLA5047	150	4	10	0.085	1	SIP12 with Fin (SLA12Pin)
SLA5052		4	10	0.115	1	SIP12 with Fin (SLA12Pin)
SLA5077		4	±10	0.2	1	SIP12 with Fin (SLA12Pin)
SLA5058		5	±7	0.2	2	SIP12 with Fin (SLA12Pin)
STA524A		3	±7	0.35	3	SIP10 (STA10Pin)
STA521A	200	4	±7	0.35	4	SIP10 (STA10Pin)
SLA5041		4	10	0.175	1	SIP12 with Fin (SLA12Pin)
SLA5089		4	10	0.12	1	SIP12 with Fin (SLA12Pin)
SLA5046		5	7	0.35	2	SIP12 with Fin (SLA12Pin)
SLA5094		5	7	0.35	2	SIP12 with Fin (SLA12Pin)
SLA5044	250	4	10	0.25	1	SIP12 with Fin (SLA12Pin)
SLA5049		5	7	0.5	2	SIP12 with Fin (SLA12Pin)

●Equivalent Circuit (for CRT Monitor S-Distortion Correction)

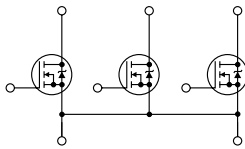
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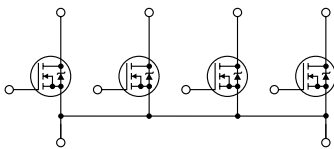
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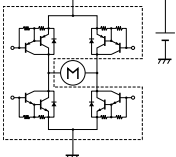
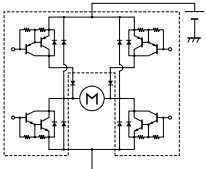
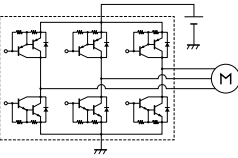
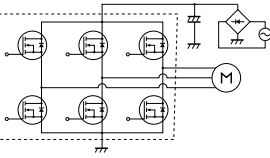
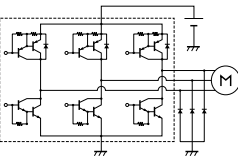
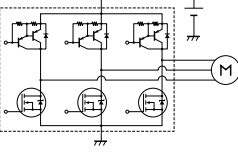
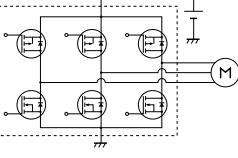


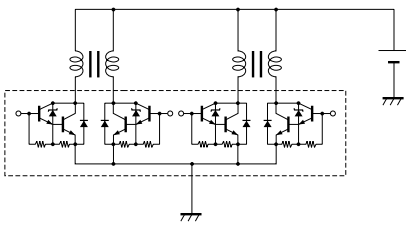
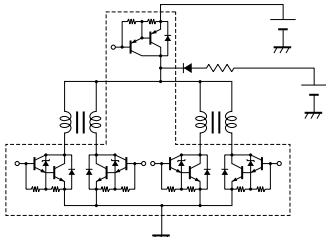
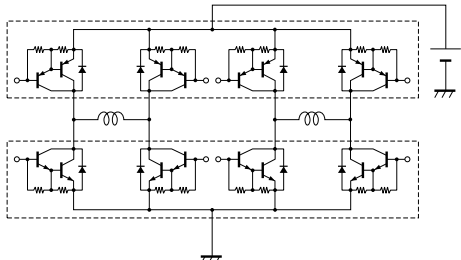
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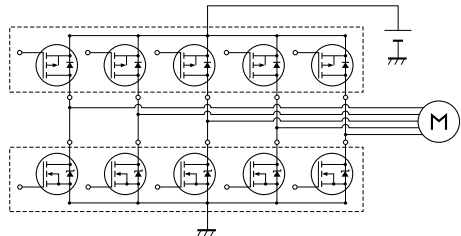


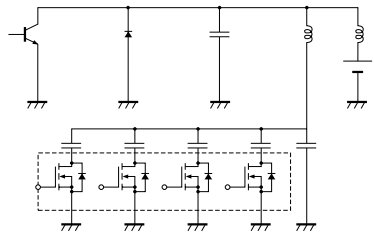
Specifications List by Application

Applications	Typical Connection Diagram	Part Number		
		Transistors		MOS FETs
		Darlington	Single	
<ul style="list-style-type: none"> ● Solenoid ● Relay 		STA301A STA371A STA401A STA406A STA435A STA471A STA475A STA481A STA485A STA4010 SDC04 SDC03	STA460C STA413A SDC06	
		SLA4031 SLA4041 SLA4060 SMA4032 SMA4033 SMA4036 SDH02		SLA5002 SLA5040 SMA5102 SMA5106 SDK02
		SLA4071 SMA4021		SLA5006
		STA302A STA308A STA402A STA408A STA472A SLA4070 SMA4020 SDA01	STA322A STA421A	SLA5004 SLA5024

Applications		Typical Connection Diagram	Part Number			
			Transistors		MOS FETs	
			Darlington	Single		
●DC Motor	Normal/Reverse Rotation Control		STA434A STA457C SLA4340 STA4390 SDH03	STA431A STA458C STA474A SLA4310 SLA8001		
	PWM Control		SLA4391		SLA5007 SLA5013 SLA5018 SMA5103	
●3-Phase DC Brushless Motor			STA302A+STA303A SMA6010 SLA6020 SDA05+SDC07 SMA6080 STA351A+STA352A			
	AC100V Direct Driver AC200V Direct Driver				SLA5072 SLA5075 SMA5112 SMA5117 SMA5118 SMA5131 SMA5132 SMA5133	
	PWM Control		SLA6012 SLA6022 SLA6023 SLA6024 SLA6026 SMA6014			
			SLA5022 SLA5023 SMA5130 STA309A STA309A	+	+	STA513A STA517A
						SLA5010 SLA5017 SLA5059 SLA5060 SLA5061 SLA5064 SMA5125 SMA5127

Applications		Typical Connection Diagram	Part Number		
			Transistors		MOS FETs
			Darlington	Single	
●Stepping Motor	Constant Voltage Driver		STA401A STA406A STA435A STA471A STA475A STA481A STA485A SLA4010 SDC04 SDC03	STA460C STA413A SDC06	
	Two Supplies Driver		SMA6511 SMA6512		
	Bipolar Driver		STA473A STA472A STA408A STA404A STA403A STA402A SMA4030 SMA4020 SLA4070 SLA4060 SLA4030 SDA01	STA421A STA412A SDC01	SMA5101 SLA5024 SLA5005 SLA5004 SLA5001

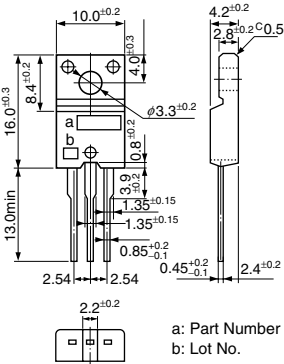
Applications	Typical Connection Diagram	Part Number	
		N-CH	P-CH
●5-Phase Motor		SLA5011 SLA5029 SLA5065+SLA5068 SLA5073+SLA5074 SLA5085	SLA5012 SLA5015 SLA5086

Applications	Typical Connection Diagram	Part Number			
		100V	150V	200V	250V
●S-Distortion Correction		SLA5037 SLA5042	SLA5058 SLA5077	SLA5041 SLA5094 STA521A STA524A	SLA5044 SLA5049

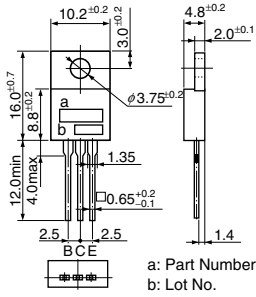
Package Type (Dimensions)

■Package Type (Dimensions)

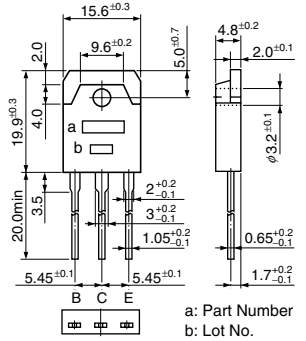
• TO-220F (FM20)



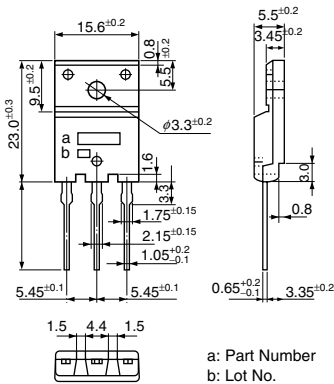
• TO-220 (MT-25)



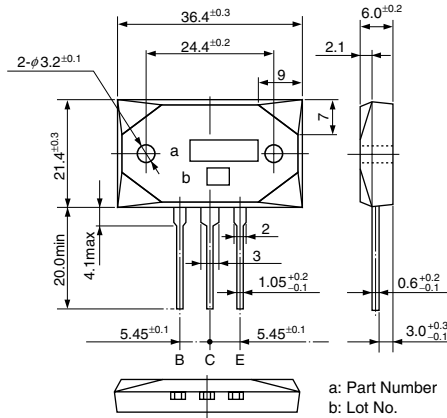
• TO-3P (MT-100)



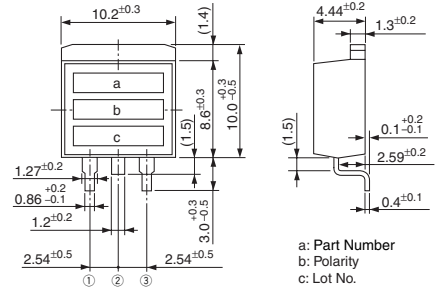
• TO-3PF (FM100)



• MT-200

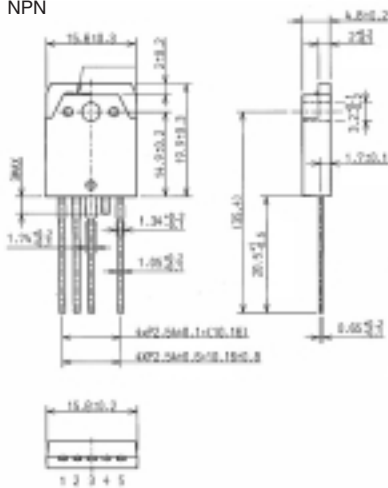


• TO-220S

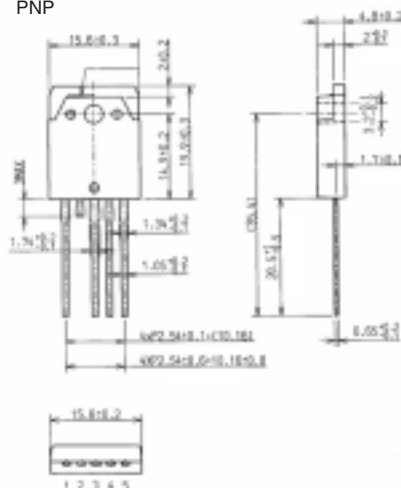


• TO3P-5Pin

NPN

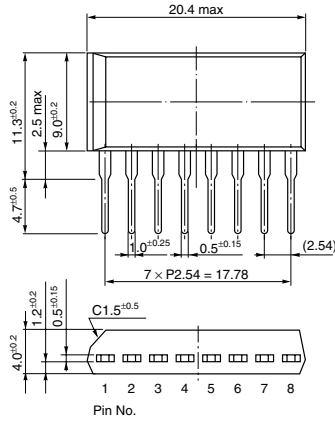


PNP

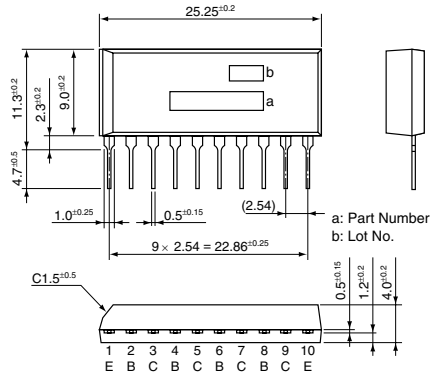


(Unit:mm)

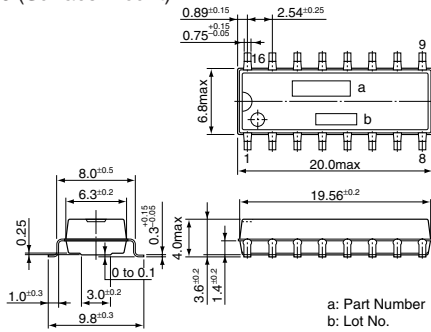
• SIP 8 (STA8Pin)



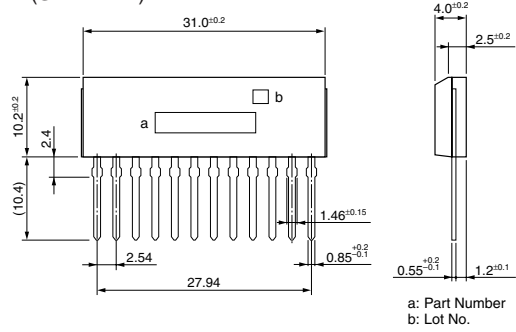
• SIP 10 (STA10Pin)



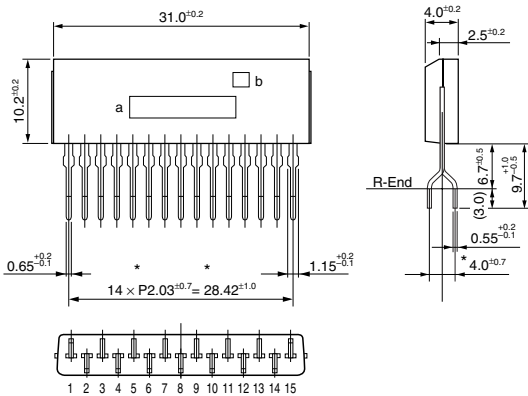
• PS 16 (Surface-Mount)



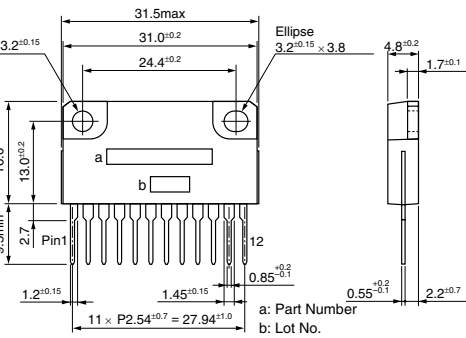
• SIP 12 (SMA12Pin)



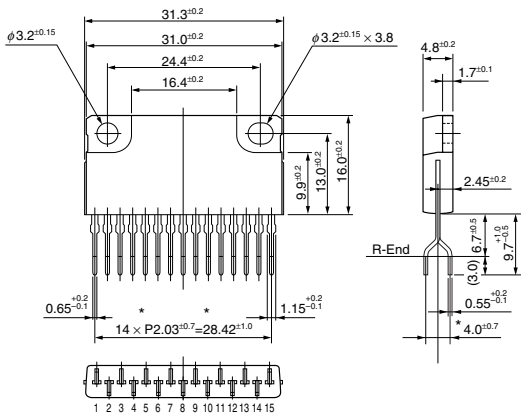
• SIP 15 (SMA15Pin)



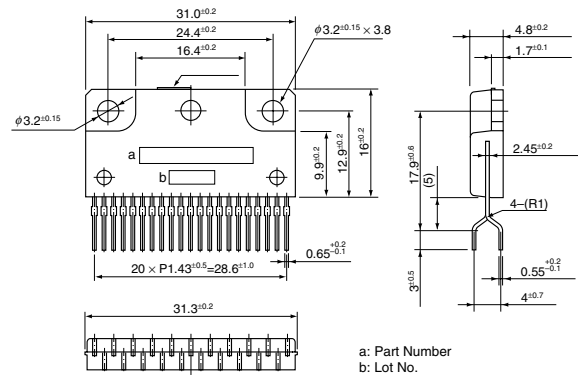
• SIP 12 with Fin (SLA12Pin)



• SIP 15 with Fin (SLA15Pin)



• SIP 21 with Fin (SLA21Pin)



(Unit:mm)