New Jersey Semi-Conductor Products, Inc.

20 STERN AVE.
SPRINGFIELD, NEW JERSEY 07081
U.S.A.

TELEPHONE: (973) 376-2922
(212) 227-6005
FAX: (973) 376-8960

MJ11028, MJ11030, MJ11032 (NPN)
MJ11029, MJ11033 (PNP)

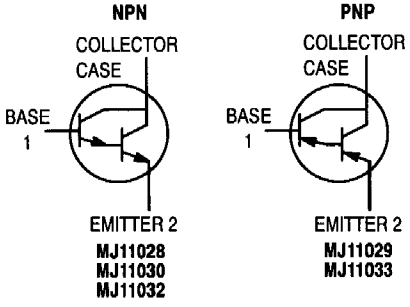
High-Current Complementary Silicon Power Transistors

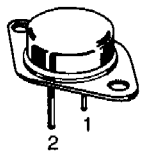
50 AMPERE COMPLEMENTARY DARLINGTON POWER TRANSISTORS 60 – 120 VOLTS 300 WATTS

High–Current Complementary Silicon Power Transistors are for use as output devices in complementary general purpose amplifier applications.

Features

- High DC Current Gain – h_{FE} = 1000 (Min) @ I_C = 25 Adc
  h_{FE} = 400 (Min) @ I_C = 50 Adc
- Curves to 100 A (Pulsed)
- Diode Protection to Rated I_C
- Monolithic Construction with Built–In Base–Emitter Shunt Resistor
- Junction Temperature to +200°C





(TO–3)

MAXIMUM RATINGS (T_J = 25°C unless otherwise noted)

Rating		Symbol	Value	Unit
Collector–Emitter Voltage	MJ11028/29 MJ11030 MJ11032/33	V_{CEO}	60 90 120	Vdc
Collector–Base Voltage	MJ11028/29 MJ11030 MJ11032/33	V_{CBO}	60 90 120	Vdc
Emitter–Base Voltage		V_{EBO}	5.0	Vdc
Collector Current – Continuous – Peak (Note 1)		I_C	50 100	Adc
Base Current – Continuous		I_B	2.0	Adc
Total Power Dissipation @ T_C = 25°C Derate Above 25°C @ T_C = 100°C		P_D	300 1.71	W W/°C
Operating and Storage Junction Temperature Range		T_J, T_{stg}	–55 to +200	°C

THERMAL CHARACTERISTICS

Characteristic	Symbol	Max	Unit
Maximum Lead Temperature for Soldering Purposes for ≤ 10 seconds	T_L	275	°C
Thermal Resistance, Junction–to–Case	$R_{\theta JC}$	0.58	°C/W

Maximum ratings are those values beyond which device damage can occur. Maximum ratings applied to the device are individual stress limit values (not normal operating conditions) and are not valid simultaneously. If these limits are exceeded, device functional operation is not implied, damage may occur and reliability may be affected.

1. Pulse Test: Pulse Width = 5 μs, Duty Cycle ≤ 10%.

MJ11028, MJ11030, MJ11032 (NPN)

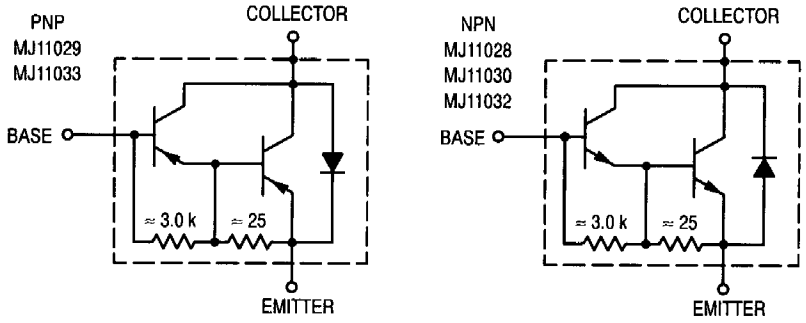


Figure 1. Darlington Circuit Schematic

ELECTRICAL CHARACTERISTICS (T_C = 25°C unless otherwise noted)

Characteristic		Symbol	Min	Max	Unit
OFF CHARACTERISTICS					
Collector–Emitter Breakdown Voltage (Note 1) (I_C = 1 00 mAdc, I_B = 0)	MJ11028, MJ11029 MJ11030 MJ11032, MJ11033	$V_{(BR)CEO}$	60 90 120	– – –	Vdc
Collector–Emitter Leakage Current		I_{CER}			mAdc
(V_{CE} = 60 Vdc, R_{BE} = 1 kΩ)	MJ11028, MJ11029		–	2	
(V_{CE} = 90 Vdc, R_{BE} = 1 kΩ)	MJ11030		–	2	
(V_{CE} = 120 Vdc, R_{BE} = 1 kΩ)	MJ11032, MJ11033		–	2	
(V_{CE} = 60 Vdc, R_{BE} = 1 kΩ, T_C = 150°C)	MJ11028, MJ11029		–	10	
(V_{CE} = 120 Vdc, R_{BE} = 1 kΩ, T_C = 150°C)	MJ11032, MJ11033		–	10	
Emitter Cutoff Current (V_{BE} = 5 Vdc, I_C = 0)		I_{EBO}	–	5	mAdc
Collector–Emitter Leakage Current (V_{CE} = 50 Vdc, I_B = 0)		I_{CEO}	–	2	mAdc
ON CHARACTERISTICS (Note 1)					
DC Current Gain		h_{FE}			–
(I_C = 25 Adc, V_{CE} = 5 Vdc)			1 k	18 k	
(I_C = 50 Adc, V_{CE} = 5 Vdc)			400	–	
Collector–Emitter Saturation Voltage		$V_{CE(sat)}$			Vdc
(I_C = 25 Adc, I_B = 250 mAdc)			–	2.5	
(I_C = 50 Adc, I_B = 500 mAdc)			–	3.5	
Base–Emitter Saturation Voltage		$V_{BE(sat)}$			Vdc
(I_C = 25 Adc, I_B = 200 mAdc)			–	3.0	
(I_C = 50 Adc, I_B = 300 mAdc)			–	4.5	

1. Pulse Test: Pulse Width ≤ 300 μs, Duty Cycle ≤ 2.0%.