

6367254 MOTOROLA SC (XSTRS/R F)

96D 80898 D

T-33-29

MOTOROLA SEMICONDUCTOR TECHNICAL DATA

**MJ3040
MJ3041
MJ3042**

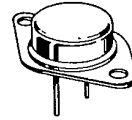
HIGH VOLTAGE SILICON POWER DARLINGTONS

... developed for line operated amplifier, series pass and switching regulator applications.

- Collector-Emitter Sustaining Voltage –
V_{CE(sus)} = 300 Vdc (Min) – MJ3040, MJ3041
= 350 Vdc (Min) – MJ3042
- High DC Current Gain –
h_{FE} = 100 (Min) @ I_C = 2.5 Adc – MJ3040
= 250 (Min) @ I_C = 2.5 Adc – MJ3041, MJ3042
- Low Collector-Emitter Saturation Voltage –
V_{CE(sat)} = 2.2 Vdc (Max) @ I_C = 2.5 Adc
- Monolithic Construction with Built-In Base-Emitter Shunt Resistors

**DARLINGTON
10 AMPERE
POWER TRANSISTORS
NPN SILICON**

300, 350 VOLTS
175 WATTS



MAXIMUM RATINGS

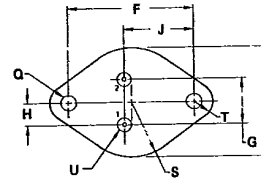
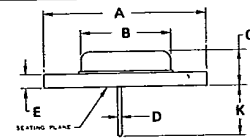
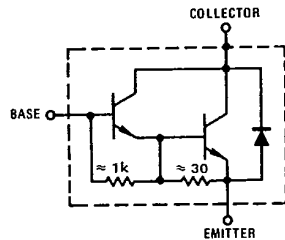
Rating	Symbol	MJ3040	MJ3041	MJ3042	Unit
Collector-Base Voltage	V _{CB}	400	400	500	Vdc
Collector-Emitter Voltage	V _{CEO}	300	300	350	Vdc
Emitter-Base Voltage	V _{EB}	← 8.0 →			Vdc
Collector Current – Continuous	I _C	← 10 →			A dc
		← 15 →			
Total Device Dissipation @ T _C = 25°C Derate above 25°C	P _D	← 1.75 →			Watts
		← 1.0 →			
Operating and Storage Junction Temperature Range	T _J , T _{stg}	← -65 to +200 →			°C

THERMAL CHARACTERISTICS

Characteristic	Symbol	Max	Unit
Thermal Resistance, Junction to Case	R _{θJC}	1.0	°C/W

(1) Pulse Width = 5.0 ms, Duty Cycle ≤ 10%.

DARLINGTON SCHEMATIC



STYLE 1
PIN 1. BASE
2. EMITTER
CASE COLLECTOR

DIM	MILLIMETERS		INCHES	
	MIN	MAX	MIN	MAX
A	—	39.37	—	1.550
B	—	21.08	—	0.830
C	6.35	7.62	0.250	0.300
D	0.97	1.09	0.038	0.043
E	1.40	1.78	0.055	0.070
F	29.90	30.40	1.177	1.197
G	10.67	11.18	0.420	0.440
H	5.33	5.69	0.210	0.220
J	16.64	17.15	0.655	0.675
K	11.18	12.19	0.440	0.480
Q	3.81	4.19	0.150	0.165
R	—	26.67	—	1.050
U	2.54	3.05	0.100	0.120

CASE 1-04

NOTES:
1. ALL RULES AND NOTES ASSOCIATED WITH REFERENCED TO-3 OUTLINE SHALL APPLY.

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 MJ3040, MJ3041, MJ3042

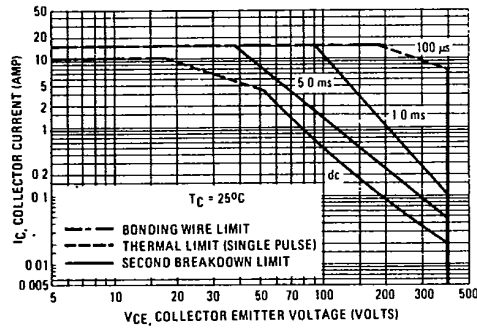
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ELECTRICAL CHARACTERISTICS ($T_C = 25^\circ\text{C}$ unless otherwise noted.)

Characteristic	Symbol	Min	Max	Unit
OFF CHARACTERISTICS				
Collector-Emitter Sustaining Voltage ($I_C = 100 \text{ mAdc}$, $I_B = 0$)	MJ3040, MJ3041 MJ3042	$V_{CE(sus)}$	300 350	Vdc
Collector Cutoff Current ($V_{CB} = 400 \text{ Vdc}$, $I_E = 0$) ($V_{CB} = 500 \text{ Vdc}$, $I_E = 0$) ($V_{CB} = 400 \text{ Vdc}$, $I_E = 0$, $T_C = 100^\circ\text{C}$) ($V_{CB} = 500 \text{ Vdc}$, $I_E = 0$, $T_C = 100^\circ\text{C}$)	MJ3040, MJ3041 MJ3042 MJ3040, MJ3041 MJ3042	I_{CBO}	— — — —	1.0 1.0 5.0 5.0
Emitter Cutoff Current ($V_{BE} = 5.0 \text{ Vdc}$, $I_C = 0$)		I_{EBO}	—	40
ON CHARACTERISTICS				
DC Current Gain ($I_C = 2.5 \text{ Adc}$, $V_{CE} = 5.0 \text{ Vdc}$) ($I_C = 5.0 \text{ Adc}$, $V_{CE} = 5.0 \text{ Vdc}$)	MJ3040 MJ3041, MJ3042 MJ3040 MJ3041, MJ3042	h_{FE}	100 250 25 50	— — — —
Collector-Emitter Saturation Voltage ($I_C = 2.5 \text{ Adc}$, $I_B = 50 \text{ mAdc}$) ($I_C = 5.0 \text{ Adc}$, $I_B = 400 \text{ mAdc}$)		$V_{CE(sat)}$	— —	2.2 2.5
Base-Emitter Saturation Voltage ($I_C = 5.0 \text{ Adc}$, $I_B = 400 \text{ mAdc}$)		$V_{BE(sat)}$	—	3.0
Base-Emitter On Voltage ($I_C = 2.5 \text{ Adc}$, $V_{CE} = 5.0 \text{ Vdc}$)		$V_{BE(on)}$	—	2.5

FIGURE 1 - FORWARD BIAS SAFE OPERATING AREA



There are two limitations on the power handling ability of a transistor — average junction temperature and second breakdown. Safe operating area curves indicate $I_C - V_{CE}$ limits of the transistor that must be observed for reliable operation; i.e., the transistor must not be subjected to greater dissipation than the curves indicate.

The data of Figure 1 is based on $T_{J(pk)} = 150^\circ\text{C}$; T_C is variable depending on conditions. At high case temperatures, thermal limitations will reduce the power that can be handled to values less than the limitations imposed by second breakdown.

FIGURE 2 - DC CURRENT GAIN

