

6367254 MOTOROLA SC (XSTRS/R F)

96D 80898 D

T-33-29

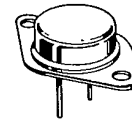
MOTOROLA **SEMICONDUCTOR** **TECHNICAL DATA**

MJ3040
MJ3041
MJ3042

HIGH VOLTAGE SILICON POWER **DARLINGTONS**

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

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

DARLINGTON
10 AMPERE
POWER TRANSISTORS
NPN SILICON
300, 350 VOLTS
175 WATTS


MAXIMUM RATINGS

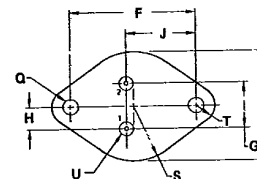
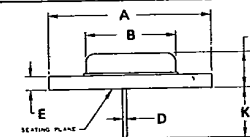
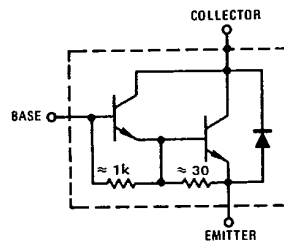
Rating	Symbol	MJ3040	MJ3041	MJ3042	Unit
Collector-Base Voltage	V_{CB}	400	400	500	Vdc
Collector-Emitter Voltage	V_{CE}	300	300	350	Vdc
Emitter-Base Voltage	V_{EB}	8.0			Vdc
Collector Current — Continuous — Peak (1)	I_C	10	10	15	Adc
		15	15	15	Adc
Total Device Dissipation @ $T_C = 25^\circ\text{C}$ Derate above 25°C	P_D	175	175	175	Watts
		1.0	1.0	1.0	W/ $^\circ\text{C}$
Operating and Storage Junction Temperature Range	T_J, T_{stg}	-65 to +200			$^\circ\text{C}$

THERMAL CHARACTERISTICS

Characteristic	Symbol	Max	Unit
Thermal Resistance, Junction to Case	$R_{\theta JC}$	1.0	$^\circ\text{C/W}$

(1) Pulse Width = 5.0 ms, Duty Cycle $\leq 10\%$.

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	5.63	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

CASE1-04

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

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96D 80899 D

MJ3040, MJ3041, MJ3042

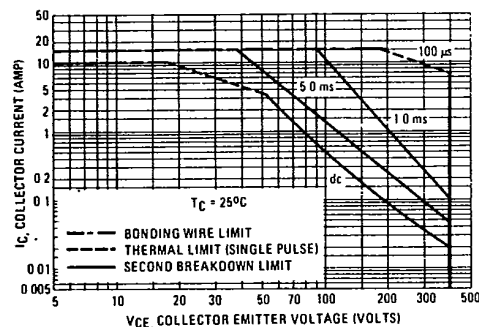
T-33-29

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 ($V_{CB} = 400\text{ Vdc}$, $I_E = 0$)	MJ3040, MJ3041	I_{CBO}	—	mAdc
($V_{CB} = 500\text{ Vdc}$, $I_E = 0$)	MJ3042	—	1.0	
($V_{CB} = 400\text{ Vdc}$, $I_E = 0$, $T_C = 100^\circ\text{C}$)	MJ3040, MJ3041	—	1.0	
($V_{CB} = 500\text{ Vdc}$, $I_E = 0$, $T_C = 100^\circ\text{C}$)	MJ3042	—	5.0	
Emitter Cutoff Current ($V_{BE} = 5.0\text{ Vdc}$, $I_C = 0$)		I_{EBO}	—	mAdc
			40	

ON CHARACTERISTICS

DC Current Gain ($I_C = 2.5\text{ Adc}$, $V_{CE} = 5.0\text{ Vdc}$)	MJ3040	h_{FE}	100	—	—
	MJ3041, MJ3042		250	—	—
($I_C = 5.0\text{ Adc}$, $V_{CE} = 5.0\text{ Vdc}$)	MJ3040		25	—	—
	MJ3041, MJ3042		50	—	—
Collector-Emitter Saturation Voltage ($I_C = 2.5\text{ Adc}$, $I_B = 50\text{ mAdc}$)		$V_{CE(sat)}$	—	2.2	Vdc
($I_C = 5.0\text{ Adc}$, $I_B = 400\text{ mAdc}$)			—	2.5	
Base-Emitter Saturation Voltage ($I_C = 5.0\text{ Adc}$, $I_B = 400\text{ mAdc}$)		$V_{BE(sat)}$	—	3.0	Vdc
Base-Emitter On Voltage ($I_C = 2.5\text{ Adc}$, $V_{CE} = 5.0\text{ Vdc}$)		$V_{BE(on)}$	—	2.5	Vdc

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