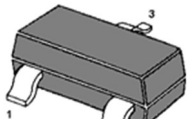
MMBT4140

NPN Silicon General Purpose Transistor



1.Base 2.Emitter 3.Collector
SOT-23 Plastic Package

Absolute Maximum Ratings (T_a = 25 °C)

Parameter	Symbol	Value	Unit
Collector Base Voltage	V_{CBO}	40	V
Collector Emitter Voltage	V_{CEO}	30	V
Emitter Base Voltage	V_{EBO}	5	V
Collector Current	I_C	1	A
Peak Collector Current	I_{CM}	2	A
Peak Base Current	I_{BM}	1	A
Total Power Dissipation	P_{tot}	200 [1)] 450 [2)]	mW
Junction Temperature	T_j	150	°C
Storage Temperature Range	T_{stg}	- 65 to +150	°C

Thermal Characteristics

Parameter	Symbol	Max.	Unit
Thermal Resistance from Junction to Ambient	$R_{\theta JA}$	625 [1)] 278 [2)]	°C/W

[1)] Device mounted on a printed-circuit board; single sided copper; tinplated; standard footprint.
[2)] Device mounted on a printed-circuit board; single sided copper; tinplated; mounting pad for collector 1cm^2 .

Characteristics at T_{amb} = 25 °C

Parameter	Symbol	Min.	Max.	Unit
Collector Base Breakdown Voltage at I_C =10.0μA	$V_{(BR)CBO}$	40	-	V
Collector Emitter Breakdown Voltage at I_C =1 mA	$V_{(BR)CEO}$	30	-	V
Emitter Base Breakdown Voltage at I_E=10.0μA	$V_{(BR)EBO}$	5	-	V
DC Current Gain at V_{CE} = 5 V, I_C = 1 mA at V_{CE} = 5 V, I_C = 500 mA at V_{CE} = 5 V, I_C = 1 A	 h_{FE} h_{FE} h_{FE}	 300 300 200	 - 900 -	 - - -
Collector Base Cutoff Current at V_{CB} = 40 V	I_{CBO}	-	100	nA
Collector Emitter Cutoff Current at V_{CE} = 30 V	I_{CES}	-	100	nA
Emitter Base Cutoff Current at V_{EB} = 5 V	I_{EBO}	-	100	nA
Collector Emitter Saturation Voltage at I_C = 100 mA, I_B = 1 mA at I_C = 500 mA, I_B = 50 mA at I_C = 1 A, I_B = 100 mA	$V_{CE(sat)}$	- - -	200 250 500	mV
Base Emitter Saturation Voltage at I_C = 1 A, I_B = 100 mA	$V_{BE(sat)}$	-	1.2	V
Base Emitter Turn-on Voltage at V_{CE} = 5 V, I_C = 1 A	$V_{BE(on)}$	-	1.1	V
Transition Frequency at V_{CE} = 10 V, I_C = 50 mA, f = 100 MHz	f_T	150	-	MHz
Collector Capacitance at V_{CB} = 10 V, f = 1 MHz	C_{ob}	-	10	pF

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Electrical Characteristics Curves

Fig. 1 DC Current Gain vs. Collector Current

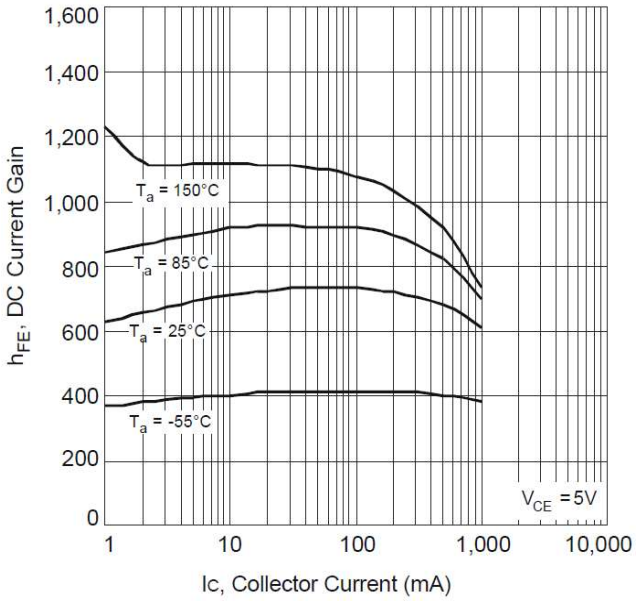


Fig. 2 V_{CESAT} vs. Collector Current

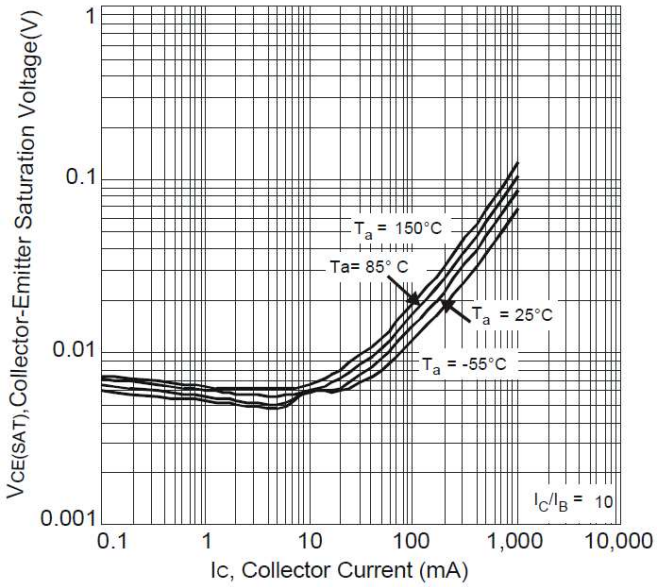


Fig. 3 Base to Emitter Voltage vs. Collector Current

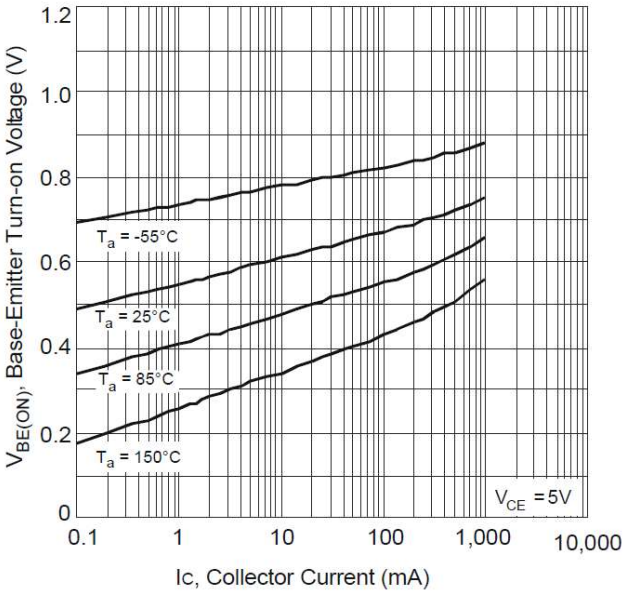
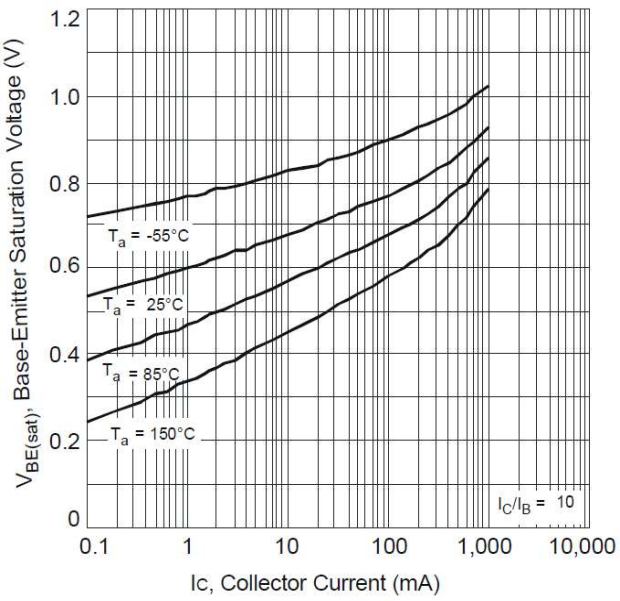


Fig. 4 V_{BESAT} vs. Collector Current



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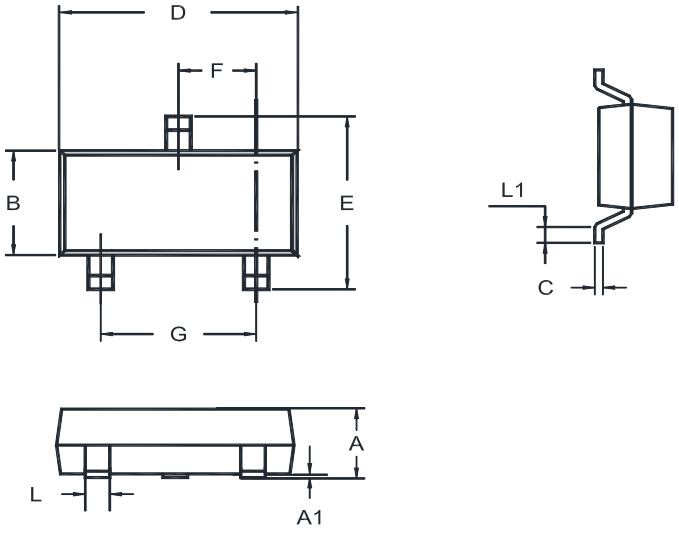
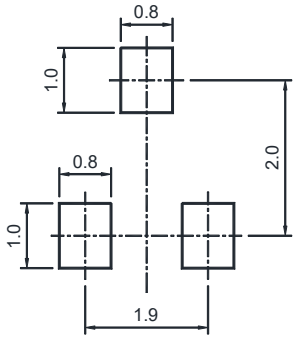
Package Outline (Dimensions in mm) SOT-23



Unit	A	A1	B	C	D	E	F	G	L	L1
mm	1.20 0.89	0.100 0.013	1.40 1.20	0.19 0.08	3.04 2.80	2.6 2.2	1.02 0.89	2.04 1.78	0.51 0.37	0.2 MIN

Recommended Soldering Footprint



Packing information

Package	Tape Width (mm)	Pitch		Reel Size		Per Reel Packing Quantity
		mm	inch	mm	inch	
SOT-23	8	4 ± 0.1	0.157 ± 0.004	178	7	3,000