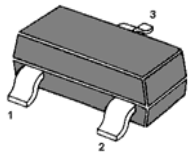
MMBT4140

NPN Silicon General Purpose Transistor



1.Base 2.Emitter 3.Collector
TO-236 Plastic Package

Absolute Maximum Ratings (T_a = 25 °C)

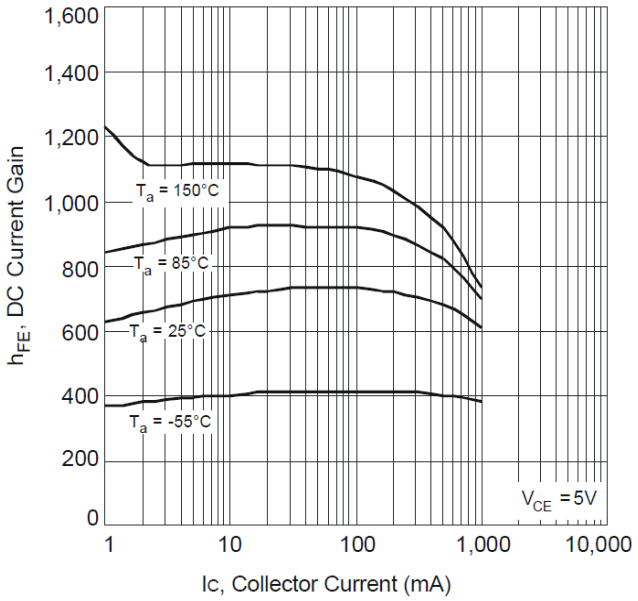
Parameter	Symbol	Value	Unit
Collector Base Voltage	V_{CBO}	40	V
Collector Emitter Voltage	V_{CEO}	30	V
Emitter Base Voltage	V_{EBO}	5	V
Collector Current (DC)	I_C	1	A
Peak Collector Current	I_{CM}	2	A
Peak Base Current	I_{BM}	1	A
Total Power Dissipation	P_{tot}	200 [1)] 450 [2)]	mW
Junction Temperature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

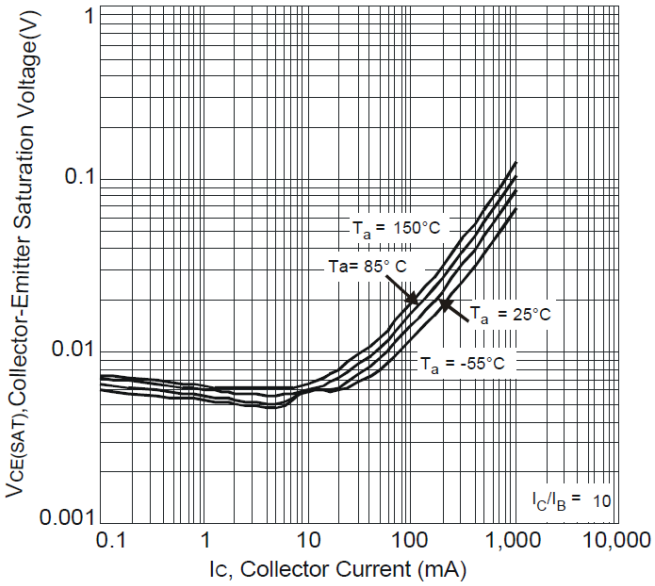
[1)] Device mounted on a printed-circuit board; single sided copper; tinplated; standard footprint.

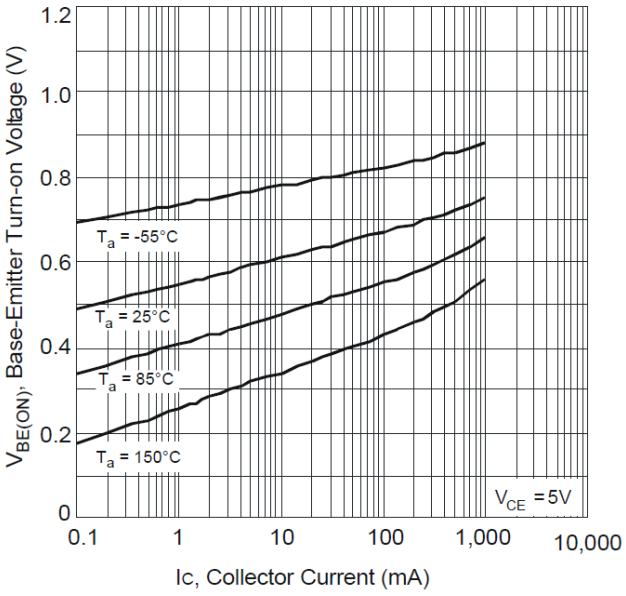
[2)] Device mounted on a printed-circuit board; single sided copper; tinplated; mounting pad for collector 1cm^2 .

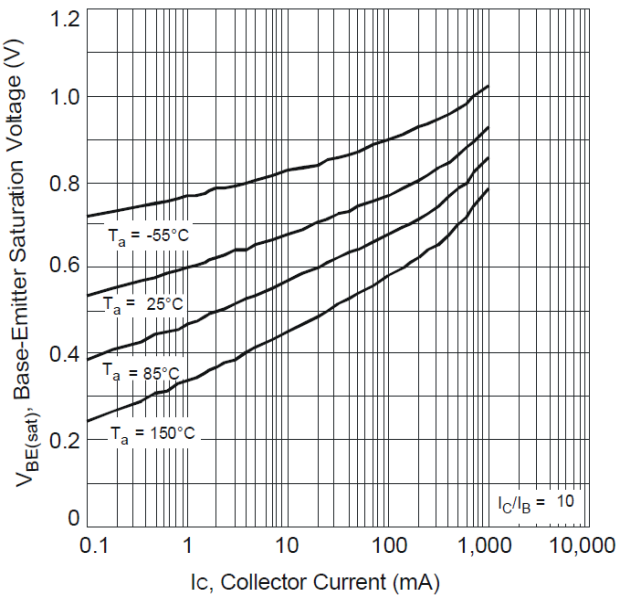
Characteristics at T_{amb} = 25 °C

Parameter	Symbol	Min.	Max.	Unit
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	-	HMz
Collector Capacitance at V_{CB} = 10 V, f = 1 MHz	C_{ob}	-	10	pF

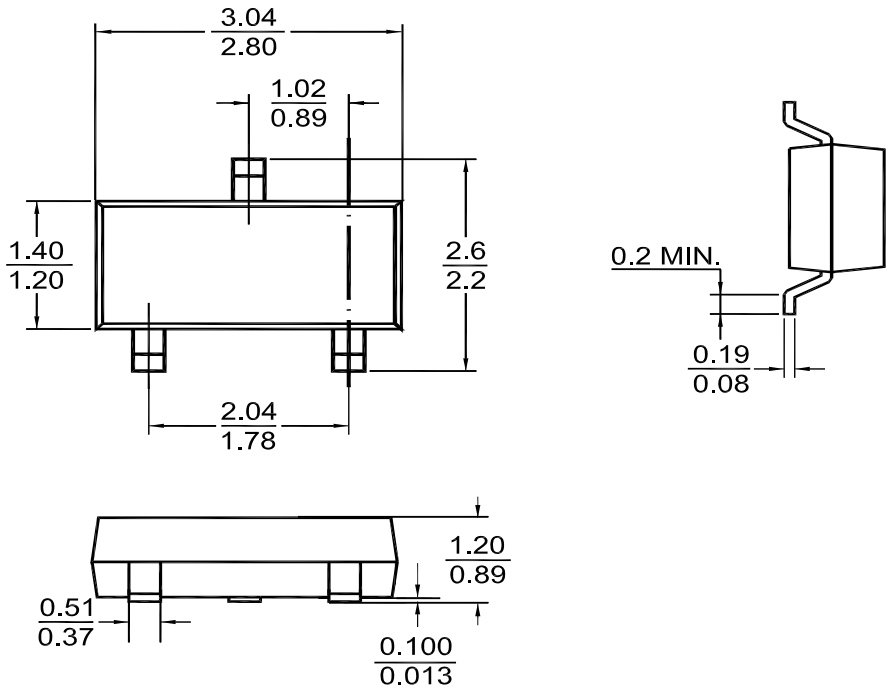

1,600
1,400
1,200
1,000
800
600
400
200
0
h_{FE}, DC Current Gain
T_a = 150°C
T_a = 85°C
T_a = 25°C
T_a = -55°C
V_{CE} = 5V
1
10
100
1,000
10,000
Ic, Collector Current (mA)


1
0.1
0.01
0.001
$V_{CE(SAT)}$, Collector-Emitter Saturation Voltage(V)
T_a = 150°C
Ta= 85° C
T_a = 25°C
T_a = -55°C
I_C/I_B = 10
0.1
1
10
100
1,000
10,000
Ic, Collector Current (mA)

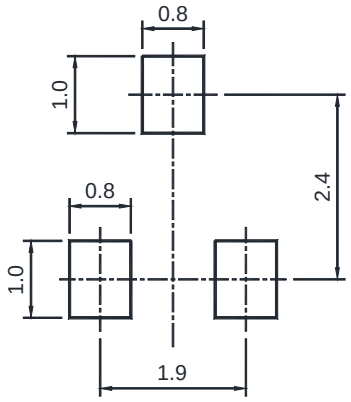

1.2
1.0
0.8
0.6
0.4
0.2
0
$V_{BE(ON)}$, Base-Emitter Turn-on Voltage (V)
T_a = -55°C
T_a = 25°C
T_a = 85°C
T_a = 150°C
V_{CE} = 5V
0.1
1
10
100
1,000
10,000
Ic, Collector Current (mA)


1.2
1.0
0.8
0.6
0.4
0.2
0
$V_{BE(sat)}$, Base-Emitter Saturation Voltage (V)
T_a = -55°C
T_a = 25°C
T_a = 85°C
T_a = 150°C
I_C/I_B = 10
0.1
1
10
100
1,000
10,000
Ic, Collector Current (mA)

Package Outline(Dimensions in mm) TO-236



Recommended Soldering Footprint



Packing information

Package	Tape Width (mm)	Pitch		Reel Size		Per Reel Packing Quantity
		mm	inch	mm	inch	
TO-236	8	4 ± 0.1	0.157 ± 0.004	178	7	3,000