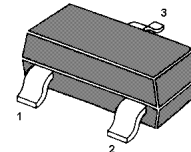


MMBT9013

NPN Silicon Epitaxial Planar Transistors

for switching and amplifier applications.

As complementary types the PNP transistor MMBT9012 is recommended.



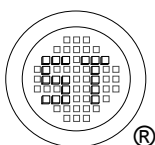
1. Base 2. Emitter 3. Collector
TO-236 Plastic Package

Absolute Maximum Ratings ($T_a = 25\text{ }^\circ\text{C}$)

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	500	mA
Power Dissipation	P_{tot}	200	mW
Junction Temperature	T_j	150	$^\circ\text{C}$
Storage Temperature Range	T_{stg}	- 55 to + 150	$^\circ\text{C}$

Characteristics at $T_a = 25\text{ }^\circ\text{C}$

Parameter	Symbol	Min.	Max.	Unit
DC Current Gain at $V_{CE} = 1\text{ V}$, $I_C = 50\text{ mA}$ at $V_{CE} = 1\text{ V}$, $I_C = 500\text{ mA}$ Current Gain Group	G	100	250	-
	H	160	400	-
	h_{FE}	40	-	-
Collector Base Cutoff Current at $V_{CB} = 35\text{ V}$	I_{CBO}	-	100	nA
Emitter Base Cutoff Current at $V_{EB} = 5\text{ V}$	I_{EBO}	-	100	nA
Collector Base Breakdown Voltage at $I_C = 100\text{ }\mu\text{A}$	$V_{(BR)CBO}$	40	-	V
Collector Emitter Breakdown Voltage at $I_C = 1\text{ mA}$	$V_{(BR)CEO}$	30	-	V
Emitter Base Breakdown Voltage at $I_E = 100\text{ }\mu\text{A}$	$V_{(BR)EBO}$	5	-	V
Collector Emitter Saturation Voltage at $I_C = 500\text{ mA}$, $I_B = 50\text{ mA}$	$V_{CE(sat)}$	-	0.6	V
Base Emitter Saturation Voltage at $I_C = 500\text{ mA}$, $I_B = 50\text{ mA}$	$V_{BE(sat)}$	-	1.2	V
Base Emitter Voltage at $V_{CE} = 1\text{ V}$, $I_C = 100\text{ mA}$	V_{BE}	-	1	V
Gain Bandwidth Product at $V_{CE} = 6\text{ V}$, $I_C = 20\text{ mA}$	f_T	100	-	MHz

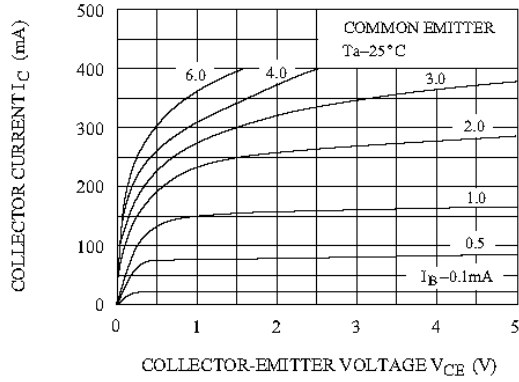


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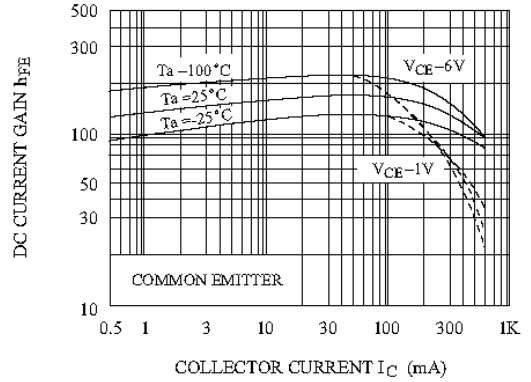


MMBT9013

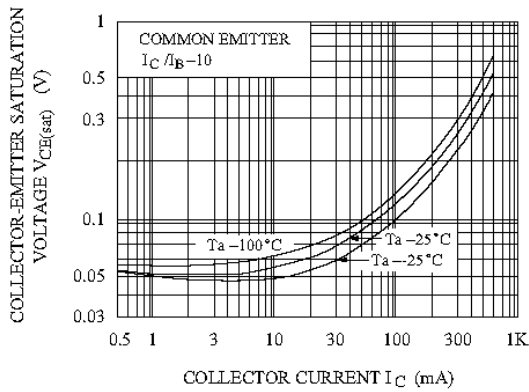
$I_C - V_{CE}$
(LOW VOLTAGE REGION)



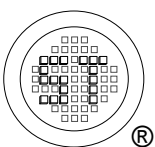
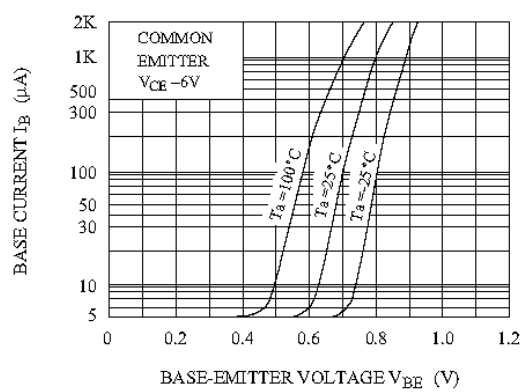
$h_{FE} - I_C$



$V_{CE(sat)} - I_C$



$I_B - V_{BE}$



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ISO/TS 16949 : 2009 Certificate No. 160713000
 ISO14001 : 2004 Certificate No. 7116
 ISO 9001 : 2008 Certificate No. 90719410
 BS-OHSAS 18001 : 2007 Certificate No. 7116
 IECQ QC 080000 Certificate No. PFC-HSPM-1485