

MMBT3904C

MMBT3904C SOT-883 Silicon General Purpose Transistor (NPN)

General description

SOT-883 Silicon General Purpose Transistor (NPN)

FEATURES

- Simplifies Circuit Design
- RoHS Compliant
- Green EMC
- Matte Tin(Sn) Lead Finish
- Weight: approx. 0.001g

Absolute Maximum Ratings ($T_A = 25^\circ\text{C}$ unless otherwise noted)

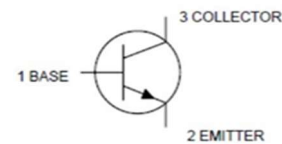
Symbol	Parameter	Value	Units
V_{CBO}	Collector-Base Voltage	60	V
V_{CEO}	Collector-Emitter Voltage	40	V
V_{EBO}	Emitter-Base Voltage	6	V
I_C	Collector Current	200	mA
P_D	Power Dissipation (FR-4 Board – minimum pad 25°C)	200	mW
$R_{\theta JA}$	Thermal Resistance from Junction to Ambient	500	$^\circ\text{C}/\text{W}$
T_J T_{STG}	Junction & Storage Temperature Range	-55 to +150	$^\circ\text{C}$

Green Product

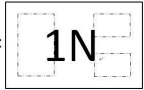


SOT-883 (DFN1006-3)

Electrical Symbol:



Device Marking Code:

Device Type	Marking	Shipping
MMBT3904C		10,000/Reel

Off Characteristics

Symbol	Parameter	Test Condition	Limits		Unit
			Min	Max	
$V_{(BR)CEO}$	Collector-Emitter Breakdown Voltage (Note 1)	$I_C = 1\text{mA}$, $I_B = 0\text{A}$	40	-	Volts
$V_{(BR)CBO}$	Collector-Base Breakdown Voltage	$I_C = 10\text{uA}$, $I_E = 0\text{A}$	60	-	Volts
$V_{(BR)EBO}$	Emitter-Base Breakdown Voltage	$I_E = 10\text{uA}$, $I_B = 0\text{A}$	6	-	Volts
I_{CBO}	Collector Cutoff Current	$V_{CB} = 60\text{V}$, $I_E = 0\text{A}$	-	0.1	μA
I_{CEX}	Collector Cutoff Current	$V_{CE} = 30\text{V}$, $V_{EB} = 3\text{V}$	-	50	nA
I_{EBO}	Emitter Cutoff Current	$V_{EB} = 5\text{V}$, $I_C = 0\text{A}$	-	0.1	μA

Note 1: Pulse Test. Pulse width <300us, Duty cycle < 2.0%

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On Characteristics

Symbol	Parameter	Test Condition	Limits		Unit
			Min	Max	
H _{FE}	DC Current Gain	I _C =0.1mA, V _{CE} =1V	40	-	-
		I _C =1.0mA, V _{CE} =1V	70	-	
		I _C =10mA, V _{CE} =1V	100	300	
		I _C =50mA, V _{CE} =1V	60	-	
		I _C =100mA, V _{CE} =1V	30	-	
V _{CE(sat)}	Collector-Emitter Saturation Voltage	I _C =10mA, I _B =1mA	-	0.2	Volts
		I _C =50mA, I _B =5mA	-	0.3	
V _{BE(sat)}	Base-Emitter Saturation Voltage	I _C =10mA, I _B =1mA	0.65	0.85	Volts
		I _C =50mA, I _B =5mA	-	0.95	

Small-signal Characteristics

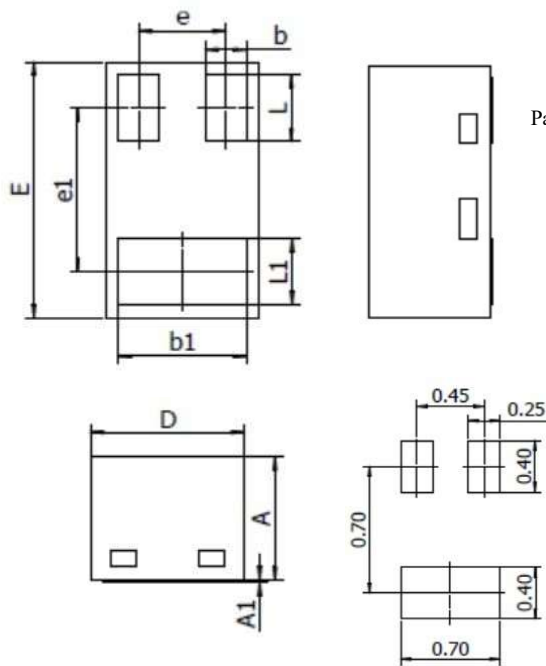
Symbol	Parameter	Test Condition	Limits		Unit
			Min	Max	
f _T	Current-Gain-Bandwidth Product	I _C =10mA, V _{CE} =20V, f = 100MHz	200	-	MHz
C _{obo}	Output Capacitance	V _{CB} =5V, I _E =0A, f = 1.0MHz	-	4	pF
C _{ibo}	Input Capacitance	V _{BE} =0.5V, I _C =0A, f = 1.0MHz	-	8	pF
h _{ie}	Input Impedance	V _{CE} =10V, I _C =1mA, f = 1.0kHz	1	10	kΩ
h _{re}	Voltage Feedback Ratio	V _{CE} =10V, I _C =1mA, f = 1.0kHz	0.5	8	X10 ⁻⁴
h _{fe}	Small-signal Current Gain	V _{CE} =10V, I _C =1mA, f = 1.0kHz	100	400	-
h _{oe}	Output Admittance	V _{CE} =10V, I _C =1mA, f = 1.0kHz	1	40	Ωmhos
NF	Noise Figure	V _{CE} =5V, I _C =100uA R _S =1.0kΩ f = 1.0kHz		5	dB

Switching Characteristics

Symbol	Parameter	Test Condition	Limits		Unit
			Min	Max	
t _d	Delay Time	V _{CC} =3V, V _{BE} =0.5V,	-	35	nS
t _r	Rise Time	I _C =10mA, I _{B1} =1mA	-	35	
t _s	Storage Time	V _{CC} =3V, I _C =10mA,	-	200	nS
t _f	Fall Time	I _{B1} = I _{B2} = 1mA	-	50	

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SOT-883 Package Outline



DIM	MILLIMETERS		INCHES	
	MIN	MAX	MIN	MAX
A	0.46	0.50	0.018	0.020
A1	---	0.03	---	0.001
D	0.55	0.65	0.022	0.026
E	0.95	1.05	0.037	0.041
b	0.12	0.22	0.005	0.008
b1	0.45	0.55	0.018	0.022
L	0.22	0.32	0.008	0.013
L1	0.22	0.32	0.008	0.013
e	Typ. 0.34		Typ. 0.013	
e1	Typ. 0.65		Typ. 0.026	

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