

Small Signal Product

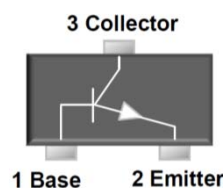
300mW, NPN Small Signal Transistor
FEATURES

- Epitaxial planar die construction
- Surface device type mounting
- Moisture sensitivity level 1
- Matte Tin (Sn) lead finish with Nickel (Ni) underplate
- Pb free version and RoHS compliant
- Packing code with suffix "G" means green compound (halogen-free)


SOT-23

MECHANICAL DATA

- Case: SOT- 23, molded plastic
- Terminal: Matte tin plated, lead free, solderable per MIL-STD-202, Method 208 guaranteed
- High temperature soldering guaranteed: 260°C/10s
- Weight: 8 mg (approximately)
- Marking Code: 1E.



MAXIMUM RATINGS AND ELECTRICAL CHARACTERISTICS (T _A =25°C unless otherwise noted)			
PARAMETER	SYMBOL	VALUE	UNIT
Power Dissipation	P _D	300	mW
Collector-Base Voltage	V _{CB0}	60	V
Collector-Emitter Voltage	V _{CEO}	40	V
Emitter-Base Voltage	V _{EBO}	6	V
Collector Current	I _C	200	mA
Junction and Storage Temperature Range	T _J , T _{STG}	-55 to +150	°C

Notes: Valid provided that electrodes are kept at ambient temperature

PARAMETER	SYMBOL	MIN	MAX	UNIT	
Collector-Base Breakdown Voltage	I _C = 10 μA I _E = 0	V _{(BR)CBO}	60	-	V
Collector-Emitter Breakdown Voltage	I _C = 1 mA I _B = 0	V _{(BR)CEO}	40	-	V
Emitter-Base Breakdown Voltage	I _E = 10 μA I _C = 0	V _{(BR)EBO}	6	-	V
Collector Cut-off Current	V _{CB} = 60 V I _E = 0	I _{CBO}	-	0.1	μA
Collector Cut-off Current	V _{CE} = 30 V V _{BE(OFF)} = 3 V	I _{CEO}	-	50	nA
Emitter Cut-off Current	V _{EB} = 5 V I _C = 0	I _{EBO}	-	0.1	μA
DC Current Gain	V _{CE} = 1 V I _C = 10 mA	h _{FE}	100	400	
	V _{CE} = 1 V I _C = 50 mA		60	-	
	V _{CE} = 1 V I _C = 100 mA		30	-	
Collector-Emitter Saturation Voltage	I _C = 50 mA I _B = 5 mA	V _{CE(sat)}	-	0.3	V
Base-Emitter Saturation Voltage	I _C = 50 mA I _B = 5 mA	V _{BE(sat)}	-	0.95	V
Transition frequency	V _{CE} = 20 V I _C = 10 mA f = 100MHz	f _T	250	-	MHz
Delay time	V _{CC} = 3 V V _{BE} = 0.5 V I _C = 10 mA I _{B1} = 1.0 mA	t _d	-	35	ns
Rise time		t _r	-	35	ns
Storage time	V _{CC} = 3 V I _C = 10 mA I _{B1} = I _{B2} = 1.0 mA	t _s	-	200	ns
Fall time		t _f	-	50	ns

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RATINGS AND CHARACTERISTICS CURVES

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

Fig.1 Typical Pulsed Current Gain vs. Collector Current

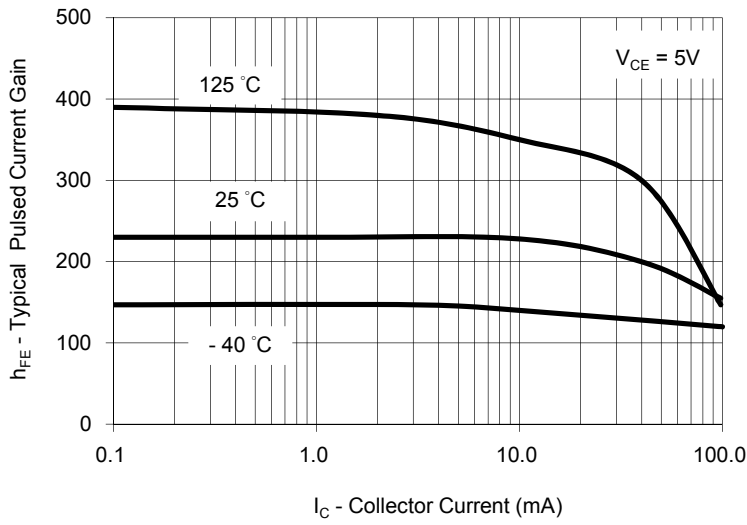


Fig. 2 Collector-Emitter Saturation Voltage vs. Collector Current

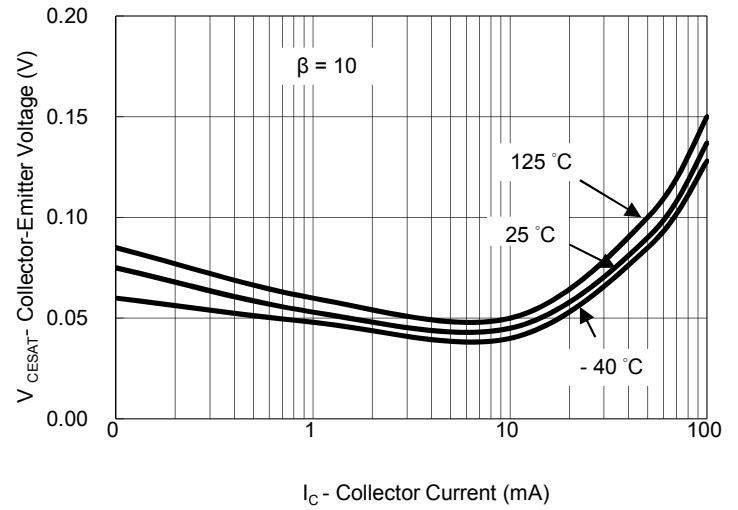


Fig. 3 Base-Emitter Saturation Voltage vs. Collector Current

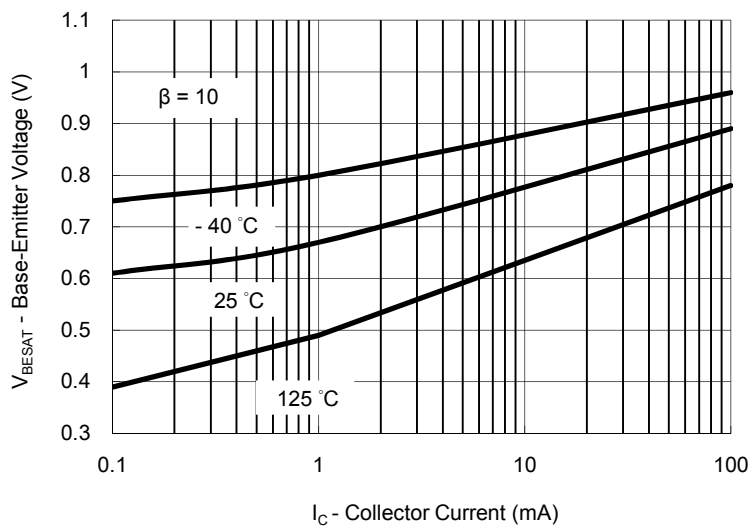


Fig. 4 Base-Emitter On Voltage vs. Collector Current

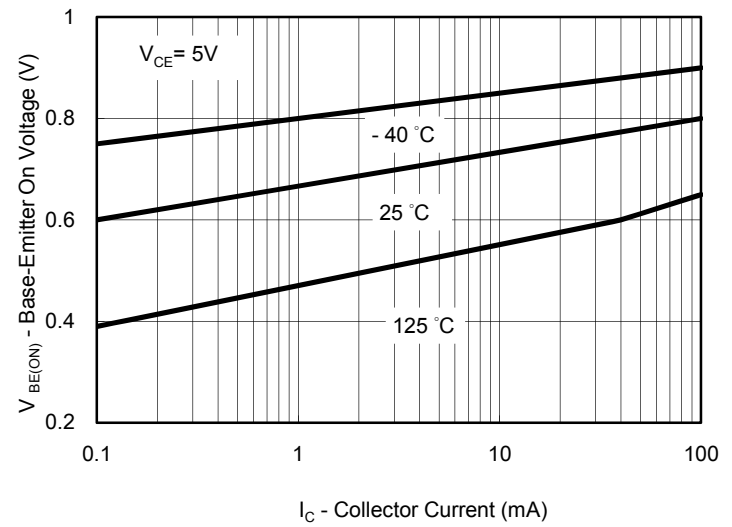


Fig. 5 Collector-Cutoff Current vs. Ambient Temperature

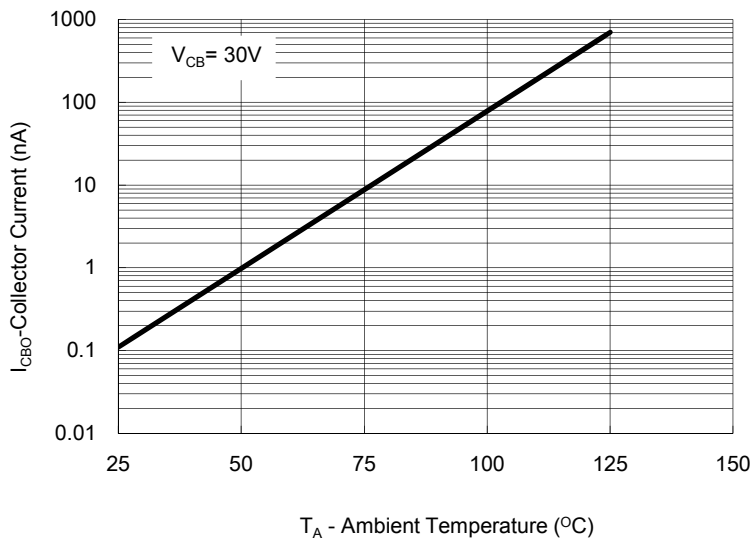
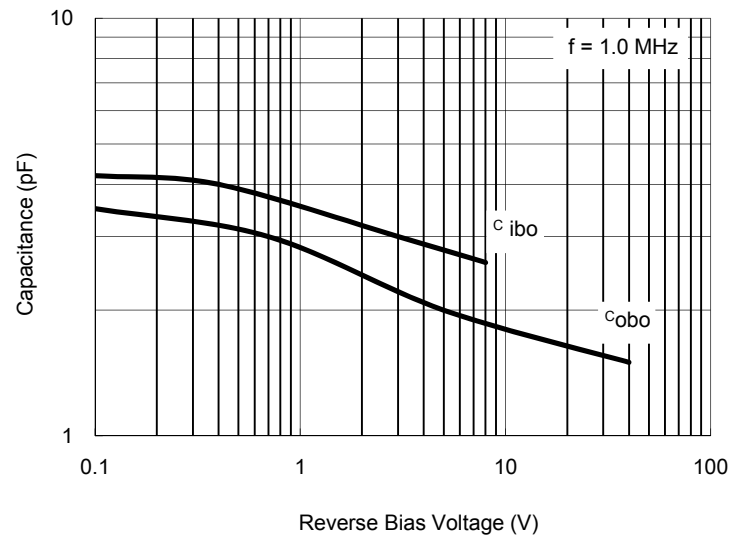


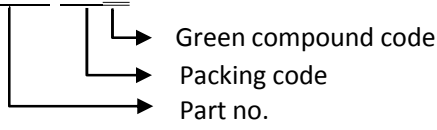
Fig. 6 Capacitance vs. Reverse Bias Voltage



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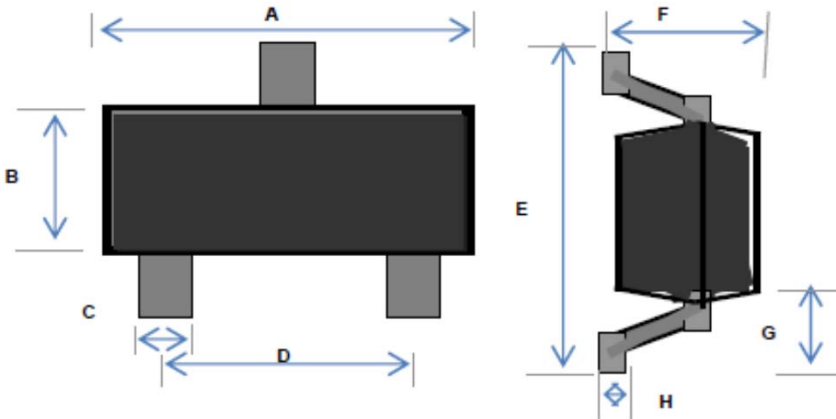
ORDER INFORMATION (EXAMPLE)

MMBT3904L RFG



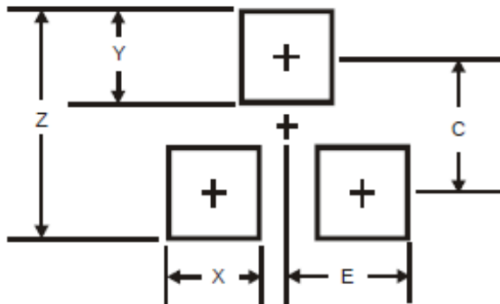
PACKAGE OUTLINE DIMENSIONS

SOT-23



DIM.	Unit(mm)		Unit(inch)	
	Min	Max	Min	Max
A	2.70	3.10	0.106	0.122
B	1.10	1.50	0.043	0.059
C	0.30	0.51	0.012	0.020
D	1.78	2.04	0.070	0.080
E	2.10	2.64	0.083	0.104
F	0.89	1.30	0.035	0.051
G	0.55 REF		0.022 REF	
H	0.10 REF		0.004 REF	

SUGGEST PAD LAYOUT



DIM	Unit (mm)	Unit (inch)
	TYP	TYP
Z	2.90	0.114
X	0.80	0.031
Y	0.90	0.035
C	2.00	0.079
E	1.35	0.053

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