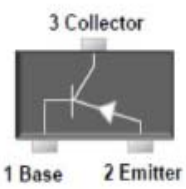
Small Signal Product

350mW, PNP 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



Pb-Free

RoHS COMPLIANT

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: 3E.

MAXIMUM RATINGS AND ELECTRICAL CHARACTERISTICS (T_A=25℃ unless otherwise noted)			
PARAMETER	SYMBOL	VALUE	UNIT
Power Dissipation	P_D	350	mW
Collector-Base Voltage	V_{CBO}	-40	V
Collector-Emitter Voltage	V_{CEO}	-40	V
Emitter-Base Voltage	V_{EBO}	-5	V
Collector Current	I_C	-200	mA
Thermal Resistance Junction-Ambient	$R_{\theta JA}$	357	°C/W
Junction and Storage Temperature Range	T_J , T_{STG}	-55 to + 150	°C

Notes:1. 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	$V_{(BR)CBO}$	-40	-	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	$V_{(BR)EBO}$	-5	-	V
Collector Base Cut-off Current		V_{CB} = -40 V		I_{CBO}	-	-100	nA
Emitter Base Cut-off Current		V_{EB} = -6 V		I_{EBO}	-	-50	nA
DC Current Gain		V_{CE} = -1 V	I_C = -0.1 mA	h_{FE}	60	300	
		V_{CE} = -1 V	I_C = -1 mA		80		
		V_{CE} = -1 V	I_C = -10 mA		100		
		V_{CE} = -1 V	I_C = -50 mA		60		
		V_{CE} = -1 V	I_C = -100 mA		30		
Collector-Emitter Saturation Voltage		I_C = -10 mA	I_B = -1 mA	$V_{CE(sat)}$	-	-0.25	V
		I_C = -50 mA	I_B = -5 mA		-	-0.4	
Base-Emitter Saturation Voltage		I_C = -10 mA	I_B = -1 mA	$V_{BE(sat)}$	-0.65	-0.85	V
		I_C= -50 mA	I_B = -5 mA		-	-0.95	
Gain-Bandwidth Product	V_{CE} = -20 V	I_C = -10 mA	f= 100MHz	f_T	250	-	MHz
Output Capacitance	V_{CB} = -5 V	I_E = 0	f= 1MHz	C_{obo}	-	4.5	pF
Delay time	V_{CC} = -3 V	V_{BE} = -0.5 V	I_C = -10 mA	t_d	-	35	ns
Rise time			I_{B1} = -1.0 mA	t_r	-	35	ns
Storage time		V_{CC} = -3 V	I_C = -10 mA	t_s	-	225	ns
Fall time		I_{B1} = I_{B2} = -1.0 mA		t_f	-	75	ns

RATINGS AND CHARACTERISTICS CURVES

(T_A=25°C unless otherwise noted)

Fig. 1 Capacitance

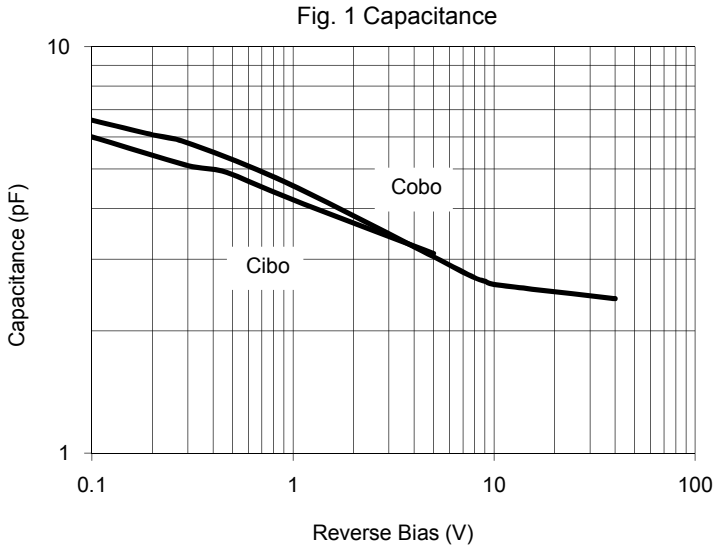


Fig. 2 Charge Data

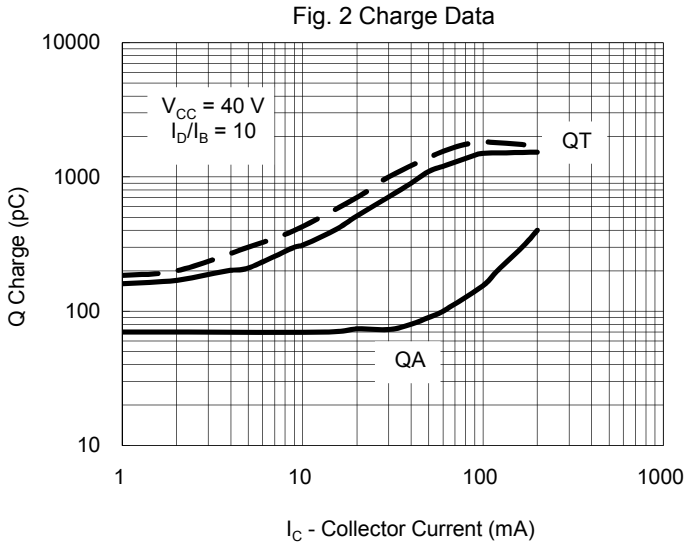


Fig. 3 Turn - On Time

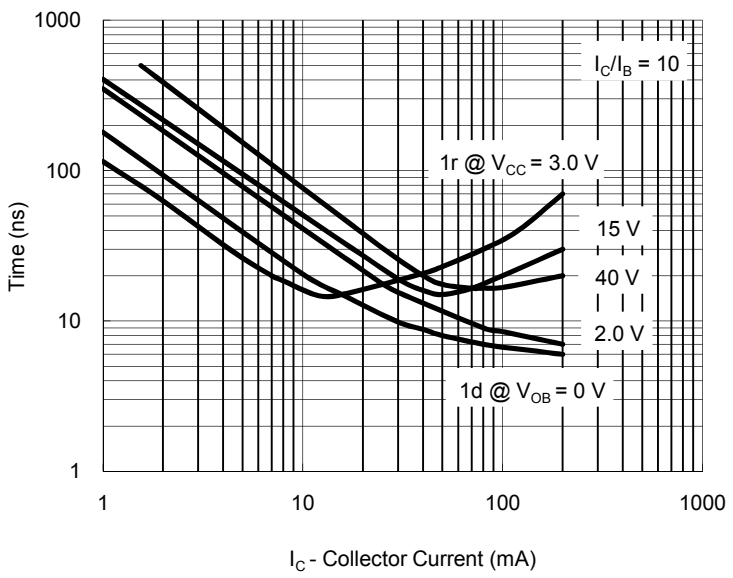


Fig. 4 Fall Time

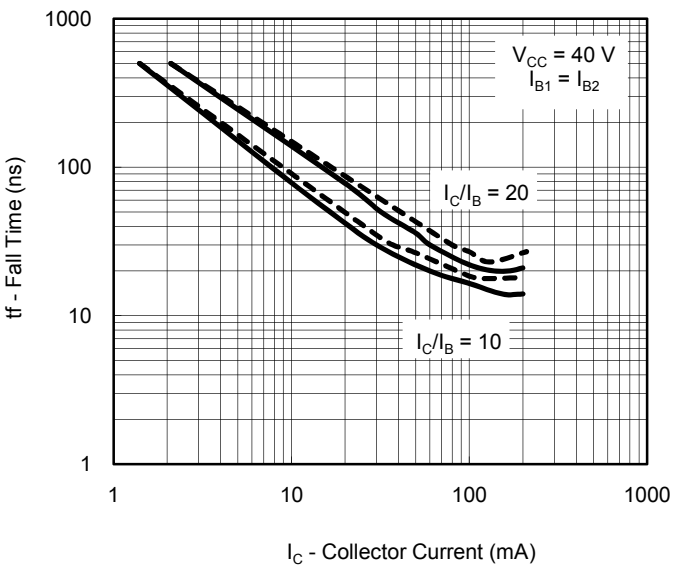


Fig. 5 Noise Figure vs. Frequency

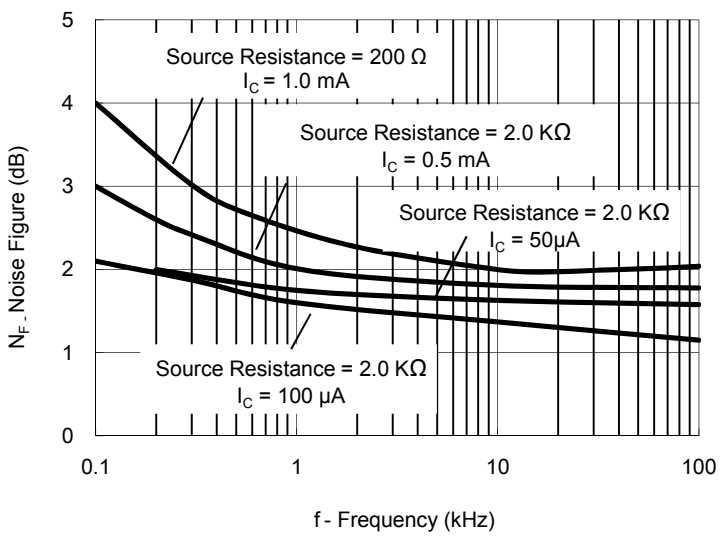
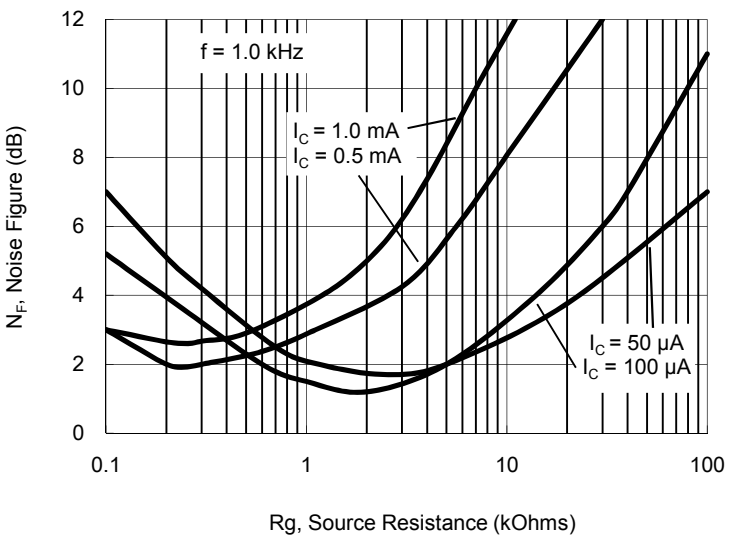


Fig. 6 Noise Figure vs. Source Resistance



h Parameters (V_{CE} = -10 V_{DC} , f = 1.0 kHz , T_A = 25 °C)

Fig. 7 Current Gain

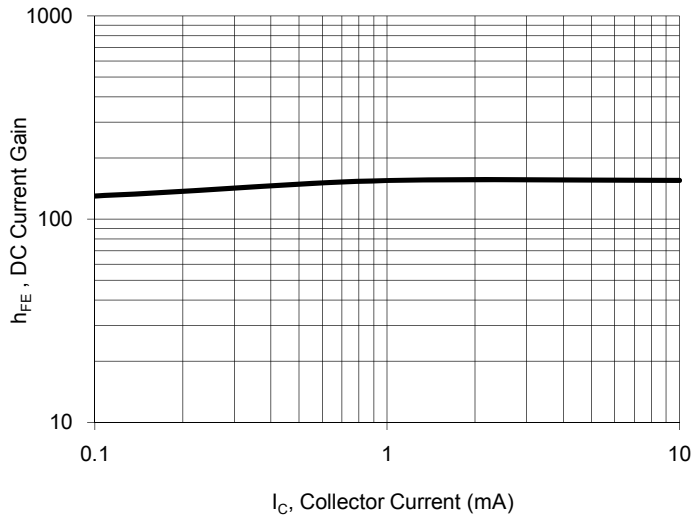


Fig. 8 Output Admittance

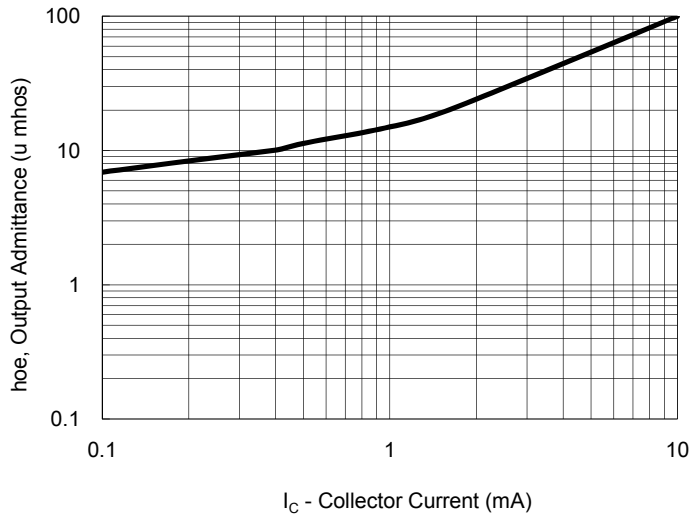


Fig. 9 Input Impedance

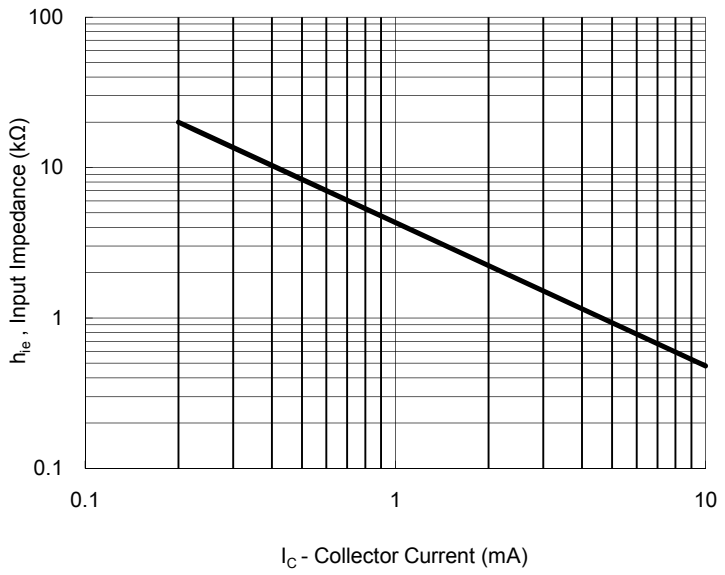


Fig. 10 Voltage Feedback Ratio

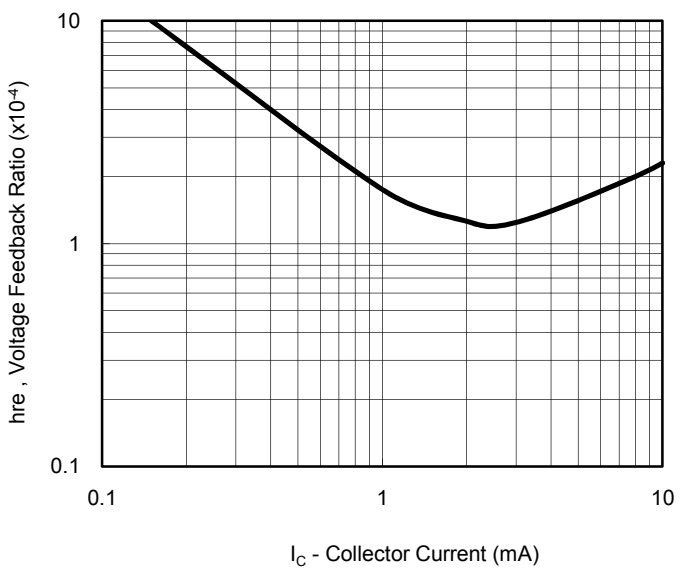


Fig. 11 "ON" Voltages

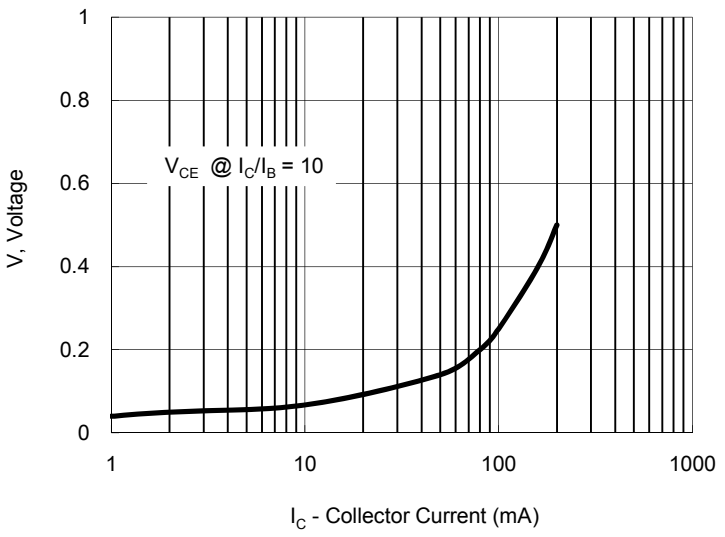
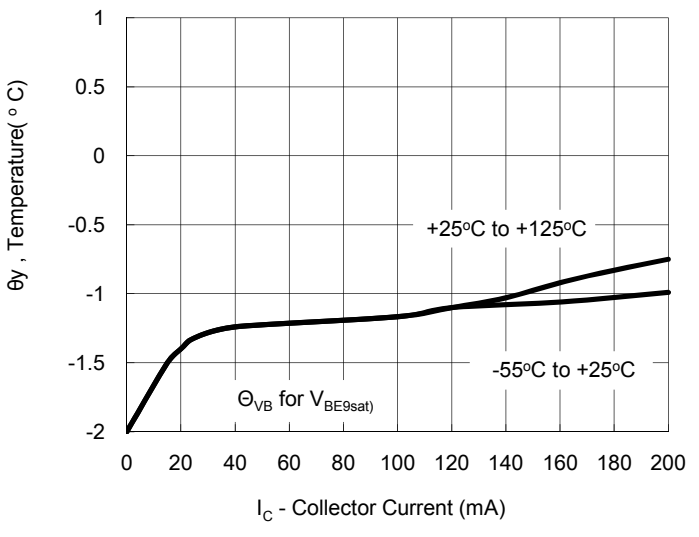


Fig. 12 Temperature Coefficients



Small Signal Product

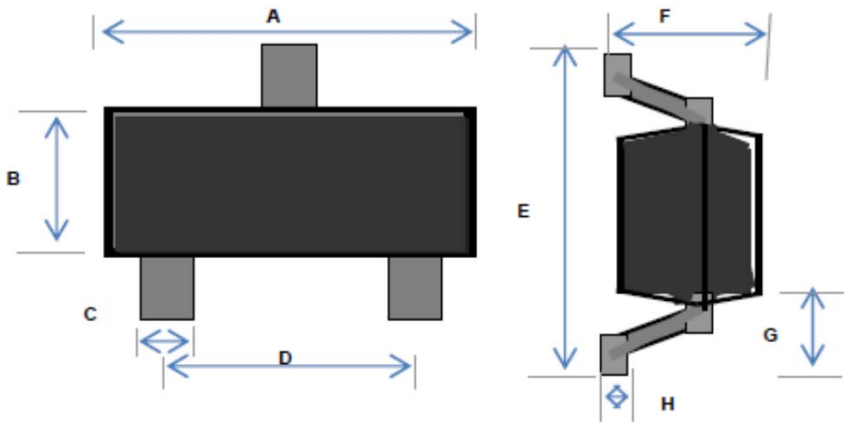
ORDER INFORMATION (EXAMPLE)

MMBT3906L RFG

- RFG → Green compound code
- Packing code
- MMBT3906L → Part no.

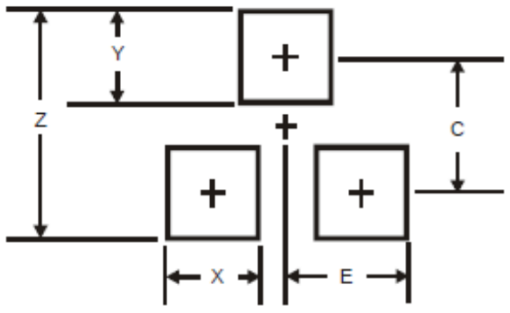
PACKAGE OUTLINE DIMENSIONS

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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