300mW, NPN Small Signal Transistor

FEATURES

- Low power loss, high efficiency
- Ideal for automated placement
- High surge current capability
- Moisture sensitivity level: level 1, per J-STD-020
- RoHS Compliant
- Halogen-free

KEY PARAMETERS		
PARAMETER	**VALUE**	**UNIT**
V_{CBO}	75	V
V_{CEO}	40	V
V_{EBO}	6	V
I_C	600	mA
h_{FE}	300	

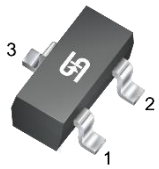
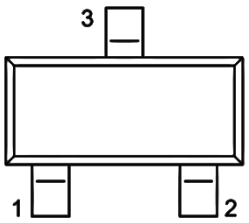
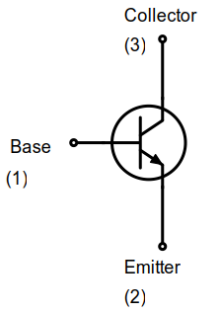
APPLICATIONS

- Switching mode power supply (SMPS)
- Adapters
- Lighting application
- On-board DC/DC converter

MECHANICAL DATA

- Case: SOT-23
- Molding compound: UL flammability classification rating 94V-0
- Matte tin plated leads, solderable per J-STD-002
- Meet JESD 201 class 1A whisker test
- Polarity: Indicated by cathode band
- Weight: 8 mg (approximately)

Pb-Free RoHS COMPLIANT HALOGEN FREE

PACKAGE: SOT-23	PIN CONFIGURATION	CIRCUIT DIAGRAM
		

ABSOLUTE MAXIMUM RATINGS (T_A = 25°C unless otherwise noted)			
PARAMETER	**SYMBOL**	**VALUE**	**UNIT**
Collector-base voltage, emitter open	V_{CBO}	75	V
Collector-emitter voltage, base open	V_{CEO}	40	V
Emitter-base voltage, collector open	V_{EBO}	6	V
Collector current, dc	I_C	600	mA
Total dc power input to all terminals	P_T	300	mW
Junction temperature	T_J	-55 to +150	°C
Storage temperature	T_{STG}	-55 to +150	°C

ELECTRICAL SPECIFICATIONS (T_A = 25°C unless otherwise noted)

PARAMETER	CONDITIONS	SYMBOL	MIN	TYP	MAX	UNIT
Collector-base breakdown voltage, emitter open	I_C = 10 μA, I_E = 0	$V_{(BR)CBO}$	75	-	-	V
Collector-emitter breakdown voltage, base open	I_C = 10 mA, I_B = 0	$V_{(BR)CEO}$	40	-	-	V
Emitter-base breakdown voltage, collector open	I_E = 10 μA, I_C = 0	$V_{(BR)EBO}$	6	-	-	V
Collector cutoff current, emitter open	V_{CB} = 60 V, I_E = 0	I_{CBO}	-	-	0.01	μA
Emitter cutoff current, collector open	V_{EB} = 3 V, I_C = 0	I_{EBO}	-	-	0.1	μA
DC Current Gain	V_{CE} = 10 V, I_C = 500 mA	h_{FE}	40	-	-	
	V_{CE} = 10 V, I_C = 150 mA		100	-	300	
	V_{CE} = 10 V, I_C = 10 mA		75	-	-	
	V_{CE} = 10 V, I_C = 1 mA		50	-	-	
	V_{CE} = 10 V, I_C = 0.1 mA		35	-	-	
Collector-emitter saturation voltage	I_C = 500 mA, I_B = 50 mA	$V_{CE(sat)}$	-	-	1	V
Base-emitter saturation voltage	I_C = 500 mA, I_B = 50 mA	$V_{BE(sat)}$	-	-	2	V
Transition frequency	V_{CE} = 20 V , I_C = 20 mA, f= 100MHz	f_T	300	-	-	MHz
Output Capacitance	1 MHz, V_{CB} = 10 V, I_E = 0	C_{OBO}	8			pF
Input Capacitance	1 MHz, V_{EB} = 0.5 V, I_C = 0	C_{IBO}	25			pF
Delay Time	V_{CC}=30V, $V_{BE(off)}$= -0.5V, I_C=150mA	t_d	-	-	10	ns
Rise Time	I_{B1}=15mA	t_r	-	-	25	ns
Storage Time	V_{CC}=30V, I_{B1}= -I_{B2}=15mA, I_C=150mA	t_s	-	-	225	ns
Fall Time	V_{CC}=30V, I_{B1}= -I_{B2}=15mA, I_C=150mA	t_f	-	-	60	ns

ORDERING INFORMATION

ORDERING CODE	PACKAGE	PACKING
MMBT2222A RFG	SOT-23	3K / 7" Reel

CHARACTERISTICS CURVES

(T_A = 25°C unless otherwise noted)

Fig.1 Max Power Dissipation VS. Ambient Temperature

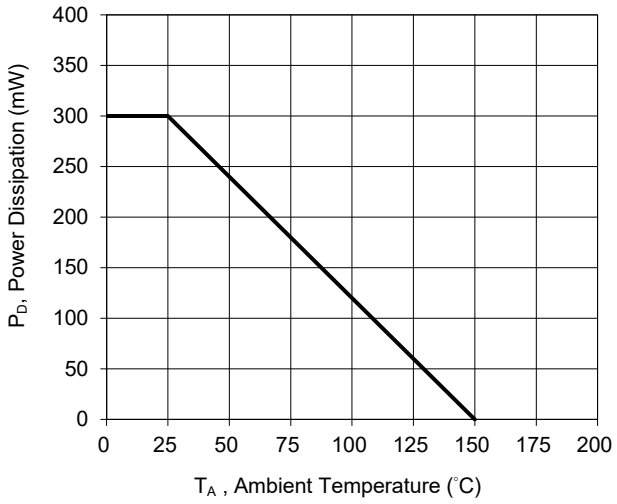


Fig.2 Typical Capacitance

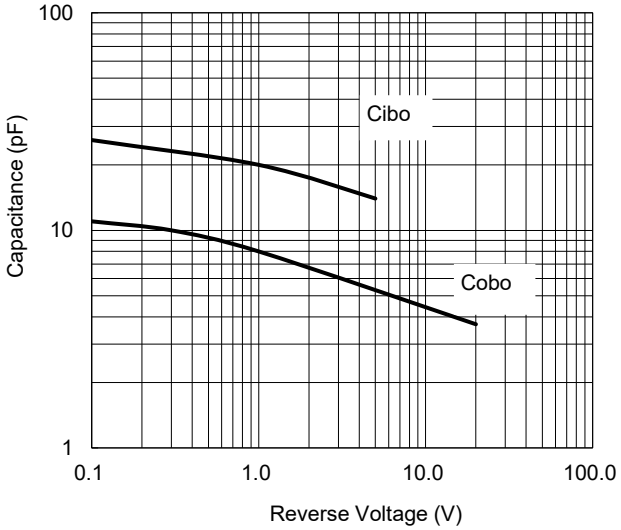


Fig.3 Typical DC Current Gain VS. Collector Current

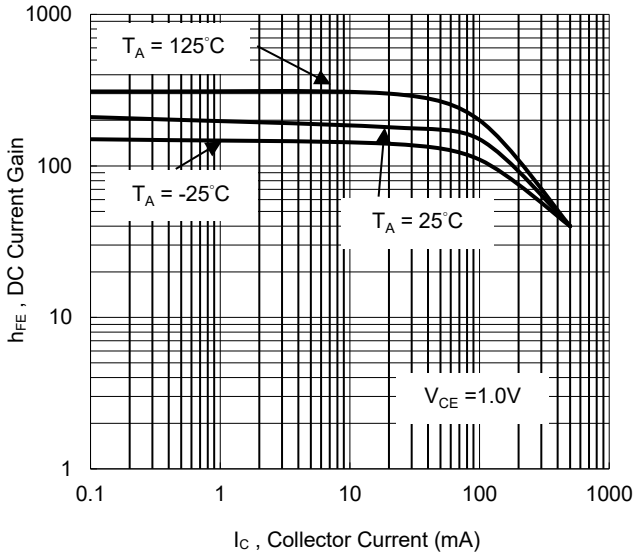
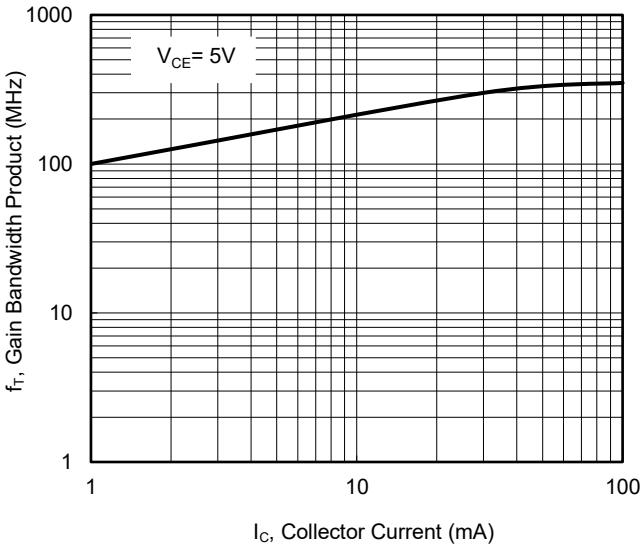


Fig.4 Gain Bandwidth Product VS. Collector Current



CHARACTERISTICS CURVES

(T_A = 25°C unless otherwise noted)

Fig.5 Collector Emitter Saturation Voltage VS. Collector Current

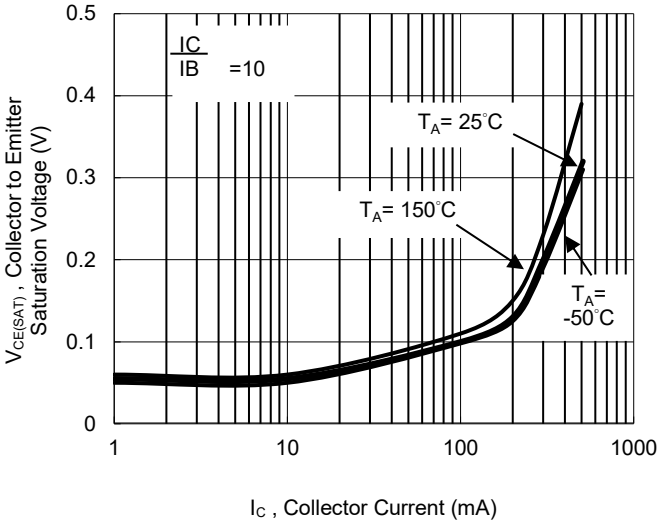
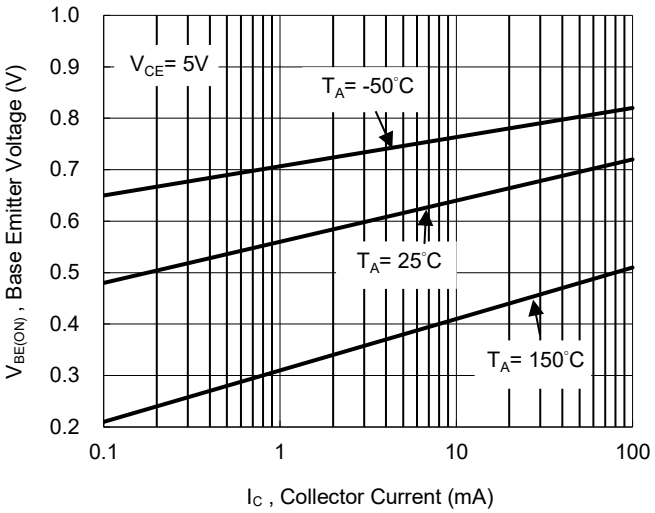
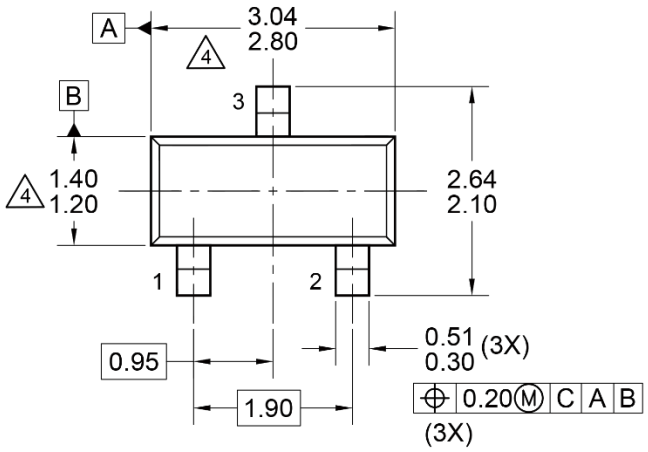


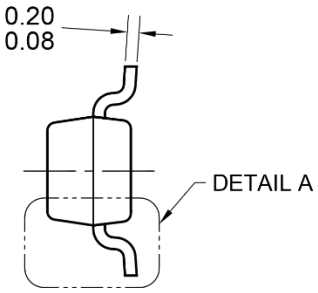
Fig.6 Base Emitter Voltage vs. Collector Current

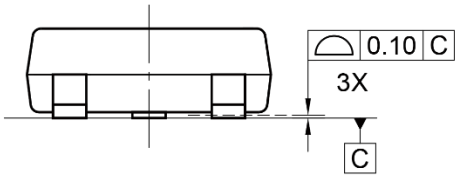


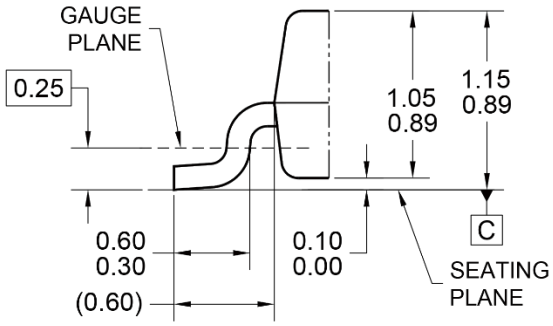
PACKAGE OUTLINE DIMENSIONS

SOT-23

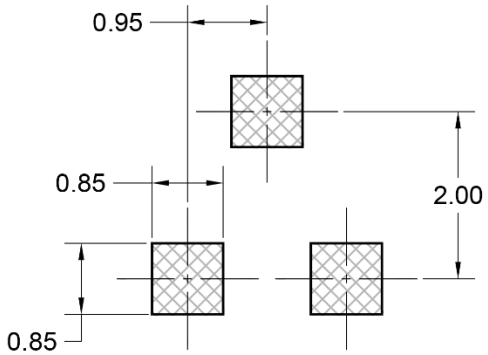




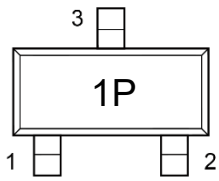




DETAIL A, ROTATED -90°
(SCALE 2:1)



SUGGESTED PAD LAYOUT



MARKING DIAGRAM

1P = Device marking

NOTES: UNLESS OTHERWISE SPECIFIED

1. ALL DIMENSIONS ARE IN MILLIMETERS.
2. DIMENSIONING AND TOLERANCING PER ASME Y14.5M-1994.
3. PACKAGE OUTLINE REFERENCE: JEDEC TO-236, ISSUE H, VARIATION AA.
4. MOLDED PLASTIC BODY DIMENSIONS DO NOT INCLUDE MOLD FLASH, PROTRUSIONS OR GATE BURRS.
5. DWG NO. REF: HQ2SD07-SOT23JEDEC-104 REV B.

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