



MMBT4401-AU

NPN GENERAL PURPOSE SWITCHING TRANSISTOR

VOLTAGE 40 Volt **POWER** 225 mWatt

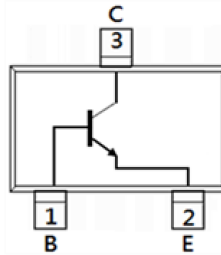
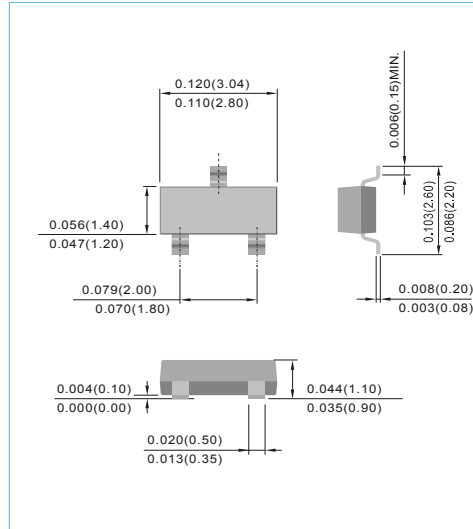
SOT-23 Unit : inch(mm)

FEATURES

- NPN epitaxial silicon, planar design
- Collector-emitter voltage $V_{CE} = 40V$
- Collector current $I_C = 600mA$
- AEC-Q101 qualified
- Lead free in compliance with EU RoHS 2.0
- Green molding compound as per IEC 61249 standard

MECHANICAL DATA

- Case: SOT-23, Plastic
- Terminals: Solderable per MIL-STD-750, Method 2026
- Approx. Weight: 0.0003 ounce, 0.0084 gram



ABSOLUTE RATINGS

PARAMETER	Symbol	Value	Units
Collector - Emitter Voltage	V_{CEO}	40	V
Collector - Base Voltage	V_{CBO}	60	V
Emitter - Base Voltage	V_{EBO}	6	V
Collector Current - Continuous	I_C	600	mA

THERMAL CHARACTERISTICS

PARAMETER	Symbol	Value	Units
Max. Power Dissipation (Note 1)	P_{TOT}	225	mW
Thermal Resistance, Junction to Ambient	$R_{\theta JA}$	556	$^{\circ}C/W$
Junction Temperature Range	T_J	-55 to 150	$^{\circ}C$
Storage Temperature Range	T_{STG}	-55 to 150	$^{\circ}C$

Note 1: Transistor mounted on FR-5 board 1.0 x 0.75 x 0.062 in.



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ELECTRICAL CHARACTERISTICS

PARAMETER	Symbol	Test Condition	MIN.	TYP.	MAX.	Units
Collector - Emitter Breakdown Voltage	$V_{(BR)CEO}$	$I_C=1.0mA, I_B=0$	40	-	-	V
Collector - Base Breakdown Voltage	$V_{(BR)CBO}$	$I_C=100\mu A, I_E=0$	60	-	-	V
Emitter - Base Breakdown Voltage	$V_{(BR)EBO}$	$I_E=100\mu A, I_C=0$	6.0	-	-	V
Base Cutoff Current	I_{BL}	$V_{CE}=35V, V_{EB}=0.4V$	-	-	100	nA
Collector Cutoff Current	I_{CEX}	$V_{CE}=35V, V_{EB}=0.4V$	-	-	100	nA
DC Current Gain	h_{FE}	$I_C=0.1mA, V_{CE}=1.0V$	20	-	-	-
		$I_C=1.0mA, V_{CE}=1.0V$	40	-	-	
		$I_C=10mA, V_{CE}=1.0V$	80	-	-	
		$I_C=150mA, V_{CE}=1.0V$	100	-	300	
		$I_C=500mA, V_{CE}=2.0V$	40	-	-	
Collector - Emitter Saturation Voltage	$V_{CE(SAT)}$	$I_C=150mA, I_B=15mA$ $I_C=500mA, I_B=50mA$	-	-	0.40 0.75	V
Base - Emitter Saturation Voltage	$V_{BE(SAT)}$	$I_C=150mA, I_B=15mA$ $I_C=500mA, I_B=50mA$	0.75 -	- -	0.95 1.20	V
Collector - Base Capacitance	C_{CBO}	$V_{CB}=5V, I_E=0, f=1MHz$	-	-	6.5	pF
Emitter - Base Capacitance	C_{EBO}	$V_{CB}=0.5V, I_C=0, f=1MHz$	-	-	30	pF
Current Gain - Bandwidth Product	F_T	$V_{CE}=10V, I_C=20mA, f=100MHz$	250	-	-	MHz
Delay Time	t_d	$V_{CC}=30V, V_{BE}=2.0V,$ $I_C=150mA, I_{B1}=15mA$	-	-	15	ns
Rise Time	t_r	$V_{CC}=30V, V_{BE}=2.0V,$ $I_C=150mA, I_{B1}=15mA$	-	-	20	ns
Storage Time	t_s	$V_{CC}=30V, I_C=150mA$ $I_{B1}=I_{B2}=15mA$	-	-	225	ns
Fall Time	t_f	$V_{CC}=30V, I_C=150mA$ $I_{B1}=I_{B2}=15mA$	-	-	30	ns



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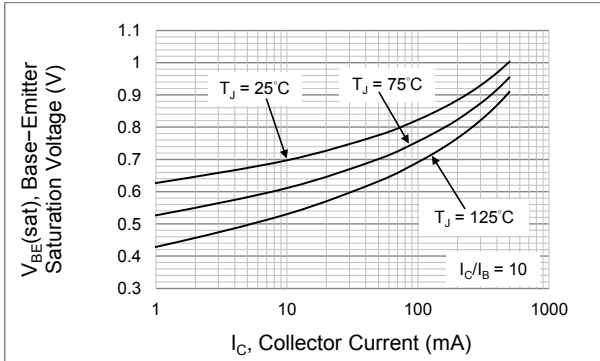


Fig.1 Base Emitter Saturation Voltage vs. Collector Current

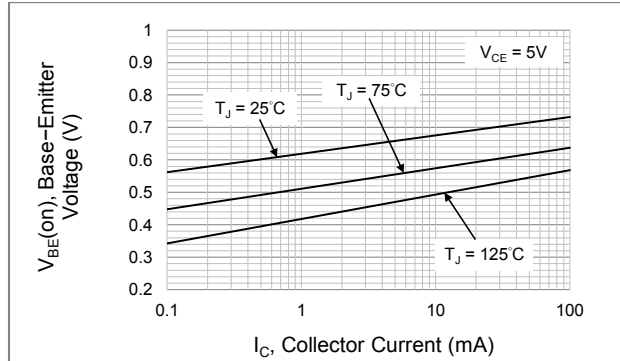


Fig.2 Base Emitter Voltage vs. Collector Current

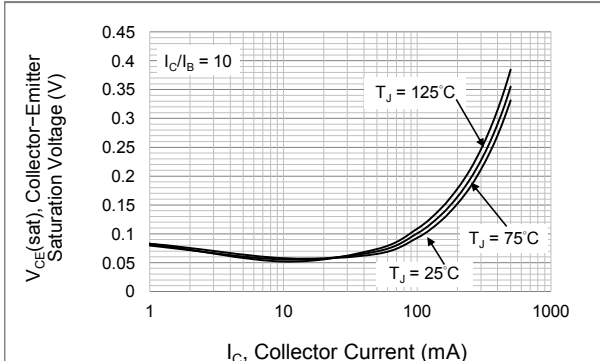


Fig.3 Collector Emitter Saturation Voltage vs. Collector Current

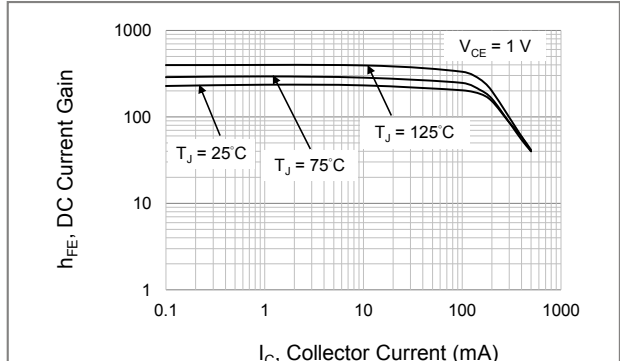


Fig.4 DC Current Gain vs. Collector Current

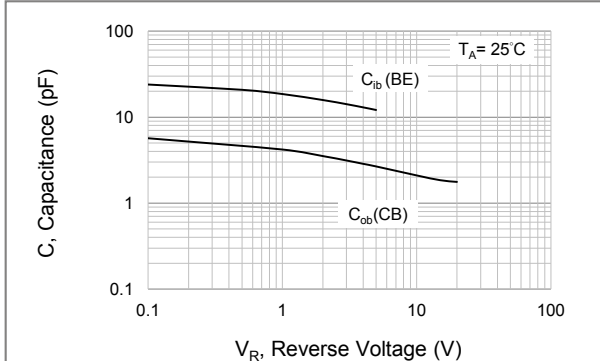


Fig.5 Typical Capacitance



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PART NO. PACKING CODE VERSION

Part No. Packing Code	Package Type	Packing Type	Marking	Version
MMBT4401-AU_R1_000A1	SOT-23	3K pcs / 7" reel	M4A	Halogen free
MMBT4401-AU_R2_000A1	SOT-23	12K pcs / 13" reel	M4A	Halogen free

MOUNTING PAD LAYOUT

