Preferred Devices

VHF/UHF Transistor

NPN Silicon

• Device Marking: 3EM

Features

• Pb–Free Package May be Available. The G–Suffix Denotes a Pb–Free Lead Finish

MAXIMUM RATINGS

Rating	Symbol	Value	Unit	
Collector-Emitter Voltage	VCEO	25	Vdc	
Collector-Base Voltage	VCBO	30	Vdc	
Emitter-Base Voltage	V _{EBO}	3.0	Vdc	

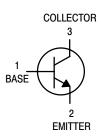
THERMAL CHARACTERISTICS

Characteristic	Symbol	Max	Unit
Total Device Dissipation FR-5 Board (Note 1) T _A = 25°C Derate above 25°C	P _D	225 1.8	mW mW/°C
Thermal Resistance, Junction to Ambient (Note 1)	$R_{ heta JA}$	556	°C/W
Total Device Dissipation Alumina Substrate (Note 2) T _A = 25°C Derate above 25°C	P _D	300 2.4	mW mW/°C
Thermal Resistance, Junction to Ambient (Note 2)	$R_{ heta JA}$	417	°C/W
Junction and Storage Temperature Range	T _J , T _{stg}	–55 to +150	°C

- 1. $FR-5 = 1.0 \times 0.75 \times 0.062$ in.
- 2. Alumina = 0.4 x 0.3 x 0.024 in. 99.5% alumina



http://onsemi.com





CASE 318 SOT-23 STYLE 6

ORDERING INFORMATION

Device	Package	Shipping [†]
MMBTH10LT1	SOT-23	3000/Tape & Reel
MMBTH10LT1G	SOT-23 (Pb-Free)	3000/Tape & Reel
MMBTH10-4LT1	SOT-23	3000/Tape & Reel

†For information on tape and reel specifications, including part orientation and tape sizes, please refer to our Tape and Reel Packaging Specifications Brochure, BRD8011/D.

Preferred devices are recommended choices for future use and best overall value.

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

Characteristic	Symbol	Min	Тур	Max	Unit
OFF CHARACTERISTICS	,				
Collector–Emitter Breakdown Voltage (I _C = 1.0 mAdc, I _B = 0)	V _(BR) CEO	25	_	-	Vdc
Collector–Base Breakdown Voltage (I _C = 100 μ Adc, I _E = 0)	V _(BR) CBO	30	-	-	Vdc
Emitter–Base Breakdown Voltage (I _E = 10 μAdc, I _C = 0)	V _{(BR)EBO}	3.0	-	-	Vdc
Collector Cutoff Current (V _{CB} = 25 Vdc, I _E = 0)	ICBO	-	-	100	nAdc
Emitter Cutoff Current (VEB = 2.0 Vdc, I _C = 0)	IEBO	-	-	100	nAdc
ON CHARACTERISTICS					
DC Current Gain $(I_C = 4.0 \text{ mAdc}, V_{CE} = 10 \text{ Vdc})$ MMBTH10LT2 MMBTH10-4LT2		60 120	_ _	- 240	_
Collector–Emitter Saturation Voltage (I _C = 4.0 mAdc, I _B = 0.4 mAdc)	VCE(sat)	-	-	0.5	Vdc
Base–Emitter On Voltage (I _C = 4.0 mAdc, V _{CE} = 10 Vdc)	VBE	-	-	0.95	Vdc
MALL-SIGNAL CHARACTERISTICS	•			•	
Current–Gain – Bandwidth Product (I _C = 4.0 mAdc, V _{CE} = 10 Vdc, f = 100 MHz) MMBTH10LT ² MMBTH10–4LT ²		650 800	- -	- -	MHz
Collector–Base Capacitance (V _{CB} = 10 Vdc, I _E = 0, f = 1.0 MHz)	C _{cb}	-	_	0.7	pF
Common–Base Feedback Capacitance (V _{CB} = 10 Vdc, I _E = 0, f = 1.0 MHz)	C _{rb}	-	-	0.65	pF
Collector Base Time Constant (I _C = 4.0 mAdc, V _{CB} = 10 Vdc, f = 31.8 MHz)	rb′C _C	-	_	9.0	ps

TYPICAL CHARACTERISTICS

COMMON-BASE y PARAMETERS versus FREQUENCY

(V_{CB} = 10 Vdc, I_C = 4.0 mAdc, T_A = 25° C)

yib, INPUT ADMITTANCE

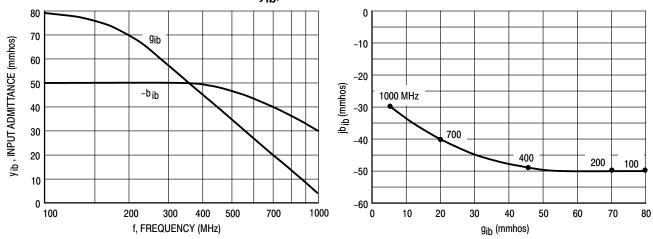


Figure 1. Rectangular Form

Figure 2. Polar Form

yfb, FORWARD TRANSFER ADMITTANCE

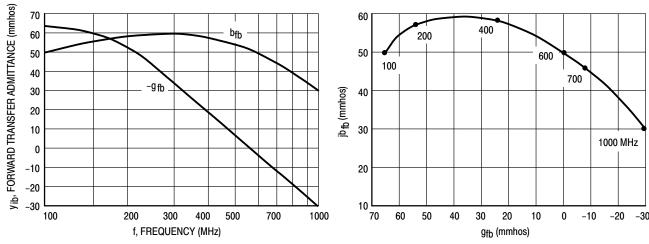


Figure 3. Rectangular Form

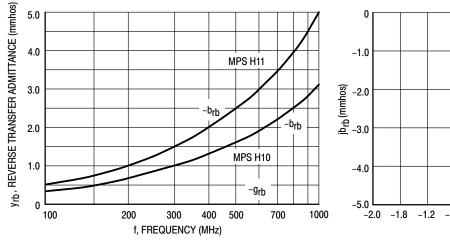
Figure 4. Polar Form

TYPICAL CHARACTERISTICS

COMMON-BASE y PARAMETERS versus FREQUENCY

 $(V_{CB} = 10 \text{ Vdc}, I_{C} = 4.0 \text{ mAdc}, T_{A} = 25^{\circ}\text{C})$

yrb, REVERSE TRANSFER ADMITTANCE



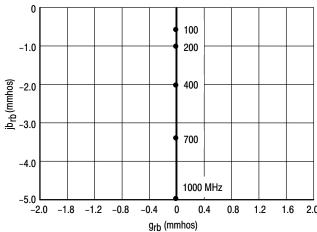
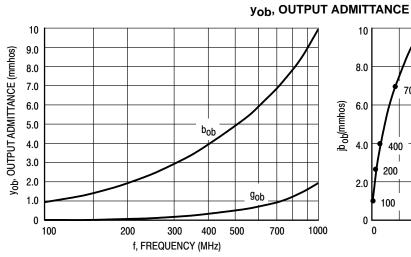


Figure 5. Rectangular Form

Figure 6. Polar Form



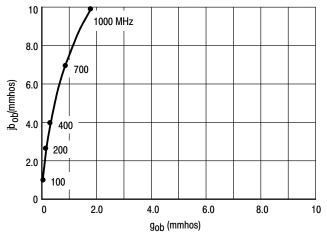
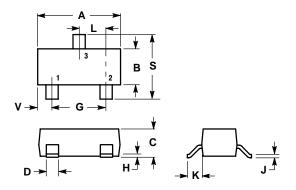


Figure 7. Rectangular Form

Figure 8. Polar Form

PACKAGE DIMENSIONS

SOT-23 (TO-236AB) CASE 318-08 **ISSUE AH**



- DIMENSIONING AND TOLERANCING PER ANSI
- 1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982. 2. CONTROLLING DIMENSION: INCH. 3. MAXIMUM LEAD THICKNESS INCLUDES LEAD FINISH THICKNESS. MINIMUM LEAD THICKNESS IS THE MINIMUM THICKNESS OF BASE
- MATERIAL.
 4. 318-03 AND -07 OBSOLETE, NEW STANDARD 318-08.

	INCHES		MILLIN	IETERS	
DIM	MIN	MAX	MIN	MAX	
Α	0.1102	0.1197	2.80	3.04	
В	0.0472	0.0551	1.20	1.40	
С	0.0350	0.0440	0.89	1.11	
D	0.0150	0.0200	0.37	0.50	
G	0.0701	0.0807	1.78	2.04	
Н	0.0005	0.0040	0.013	0.100	
J	0.0034	0.0070	0.085	0.177	
K	0.0140	0.0285	0.35	0.69	
L	0.0350	0.0401	0.89	1.02	
S	0.0830	0.1039	2.10	2.64	
٧	0.0177	0.0236	0.45	0.60	
STYLE 6:					
PIN 1. BASE					
2. EMITTER					
COLLECTOR					

SOLDERING FOOTPRINT*

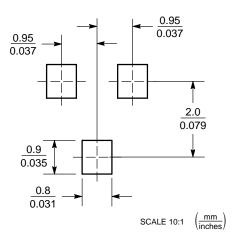


Figure 9. SOT-23

^{*}For additional information on our Pb–Free strategy and soldering details, please download the ON Semiconductor Soldering and Mounting Techniques Reference Manual, SOLDERRM/D.

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