

The RF Line

NPN Silicon

High-Frequency Transistor

Designed for thick and thin-film circuits using surface mount components and requiring low-noise, high-gain signal amplification at frequencies to 1.0 GHz.

- High Gain — $G_{pe} = 17$ dB Typ @ $f = 450$ MHz
- Low Noise — $NF = 2.5$ dB Typ @ $f = 450$ MHz
- Available in tape and reel packaging options:
T1 suffix = 3,000 units per reel

MMBR5031LT1

RF AMPLIFIER
TRANSISTOR
NPN SILICON

MAXIMUM RATINGS

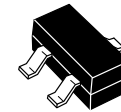
Rating	Symbol	Value	Unit
Collector-Emitter Voltage	V_{CEO}	10	Vdc
Collector-Base Voltage	V_{CBO}	15	Vdc
Emitter-Base Voltage	V_{EBO}	3.0	Vdc
Collector Current — Continuous	I_C	20	mAdc
Maximum Junction Temperature	T_{Jmax}	150	°C
Power Dissipation, $T_{case} = 75^\circ\text{C}$ (1) Derate linearly above $T_{case} = 75^\circ\text{C}$ @	$P_{D(max)}$	0.300 4.00	W mW/°C

THERMAL CHARACTERISTICS

Characteristic	Symbol	Max	Unit
Storage Temperature	T_{stg}	-55 to +150	°C
Thermal Resistance Junction to Case	$R_{\theta JC}$	250	°C/W

DEVICE MARKING

MMBR5031LT1 = 7G



CASE 318-08, STYLE 6
SOT-23
LOW PROFILE
(TO-236AA/AB)

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

Characteristic	Symbol	Min	Typ	Max	Unit
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OFF CHARACTERISTICS

Collector-Emitter Breakdown Voltage ($I_C = 1.0$ mAdc, $I_B = 0$)	$V_{(BR)CEO}$	10	—	—	Vdc
Collector-Base Breakdown Voltage ($I_C = 0.01$ mAdc, $I_E = 0$)	$V_{(BR)CBO}$	15	—	—	Vdc
Emitter-Base Breakdown Voltage ($I_E = 0.01$ mAdc, $I_C = 0$)	$V_{(BR)EBO}$	3.0	—	—	Vdc
Collector Cutoff Current ($V_{CB} = 6.0$ Vdc, $I_E = 0$)	I_{CBO}	—	—	10	nAdc

ON CHARACTERISTICS

DC Current Gain ($I_C = 1.0$ mAdc, $V_{CE} = 6.0$ Vdc)	h_{FE}	25	—	300	—
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SMALL-SIGNAL CHARACTERISTICS

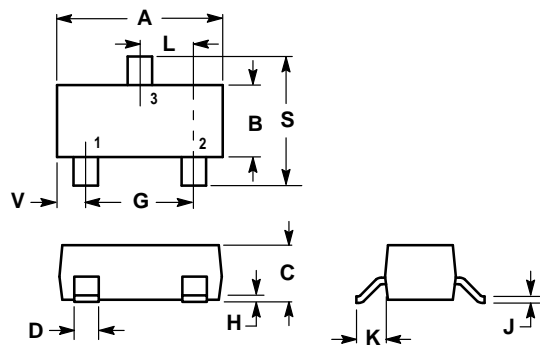
Current-Gain — Bandwidth Product ($I_C = 5.0$ mAdc, $V_{CE} = 6.0$ Vdc, $f = 100$ MHz)	f_T	—	1,000	—	MHz
Collector-Base Capacitance ($V_{CE} = 6.0$ Vdc, $I_E = 0$, $f = 0.1$ MHz)	C_{cb}	—	—	1.5	pF
Minimum Noise Figure ($I_C = 1.0$ mAdc, $V_{CE} = 6.0$ Vdc, $f = 450$ MHz)	NF_{min}	—	2.5	—	dB
Common-Emitter Amplifier Power Gain ($I_C = 1.0$ mAdc, $V_{CE} = 6.0$ Vdc, $f = 450$ MHz)	G_{pe}	—	17	25	dB

NOTE:

1. Case temperature measured on collector lead immediately adjacent to body of package.

Freescale Semiconductor, Inc. ARCHIVE INFORMATION

ARCHIVE INFORMATION



- NOTES:
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.

DIM	INCHES		MILLIMETERS	
	MIN	MAX	MIN	MAX
A	0.1102	0.1197	2.80	3.04
B	0.0472	0.0551	1.20	1.40
C	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
H	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
V	0.0177	0.0236	0.45	0.60

- STYLE 6:
 PIN 1. BASE
 2. EMITTER
 3. COLLECTOR

CASE 318-08
 ISSUE AF

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MMBR5031LT1/D