

The RF Line
PNP Silicon
High-Frequency Transistor

... designed for high-gain, low-noise amplifier oscillator and mixer applications. Specifically packaged for thick and thin-film circuits using surface mount components.

- High Gain — $G_{pe} = 17$ dB Typ @ $f = 450$ MHz
- Low Noise — $NF = 3.0$ dB Typ @ $f = 450$ MHz
- Available in tape and reel packaging options by adding suffix:
T1 suffix = 3,000 units per reel
T3 suffix = 10,000 units per reel

MMBR4957LT1, T3

$I_C = -30$ mA
HIGH-FREQUENCY
TRANSISTOR
PNP SILICON

MAXIMUM RATINGS

Rating	Symbol	Value	Unit
Collector-Emitter Voltage	V_{CEO}	-30	Vdc
Collector-Base Voltage	V_{CBO}	-30	Vdc
Emitter-Base Voltage	V_{EBO}	-3.0	Vdc
Collector Current — Continuous	I_C	-30	mAdc
Maximum Junction Temperature	T_{Jmax}	150	°C
Power Dissipation, $T_{case} = 75^\circ\text{C}^*$ Derate linearly above $T_{case} = 75^\circ\text{C} @$	$P_{D(max)}$	0.278 3.70	W mW/°C

THERMAL CHARACTERISTICS

Characteristic	Symbol	Max	Unit
Storage Temperature	T_{stg}	-55 to +150	°C
Thermal Resistance Junction to Case*	$R_{\theta JC}$	270	°C/W

* Package mounted on 99.5% alumina $10 \times 8 \times 0.6$ mm.



CASE 318-07, STYLE 6
SOT-23
LOW PROFILE
(TO-236AA/AB)

DEVICE MARKING

MMBR4957LT1, T3 = 7F

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, $I_E = 0$)	$V_{(BR)CEO}$	-30	—	—	Vdc
Collector-Base Breakdown Voltage ($I_C = -100$ μ Adc, $I_E = 0$)	$V_{(BR)CBO}$	-30	—	—	Vdc
Emitter-Base Breakdown Voltage ($I_E = -100$ μ Adc, $I_C = 0$)	$V_{(BR)EBO}$	-3.0	—	—	Vdc
Collector Cutoff Current ($V_{CB} = -10$ Vdc, $I_C = 0$)	I_{CBO}	—	—	-0.1	μ Adc

ON CHARACTERISTICS

DC Current Gain ($I_C = -2.0$ mAdc, $V_{CE} = -10$ Vdc)	h_{FE}	20	—	150	—
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SMALL-SIGNAL CHARACTERISTICS

Current-Gain — Bandwidth Product ($I_E = -2.0$ mAdc, $V_{CE} = -10$ Vdc, $f = 100$ MHz)	f_T	—	1200	—	MHz
Collector-Base Capacitance ($V_{CB} = -10$ Vdc, $I_E = 0$, $f = 1.0$ MHz)	C_{cb}	—	—	0.8	pF
Common-Emitter Amplifier Power Gain ($V_{CE} = -10$ Vdc, $I_C = -2.0$ mAdc, $f = 450$ MHz)	G_{pe}	—	17	—	dB
Noise Figure ($I_C = -2.0$ mAdc, $V_{CE} = -10$ Vdc, $f = 450$ MHz)	NF	—	3.0	—	dB

REV 6

VCE (Volts)	I _C (mA)	f MHz	S ₁₁		S ₂₁		S ₁₂		S ₂₂		
			S ₁₁	∠φ	S ₂₁	∠φ	S ₁₂	∠φ	S ₂₂	∠φ	
-5.0	-5.0	0.1	0.61	-37	9.28	148	0.03	72	0.90	-16	
		0.3	0.39	-83	5.56	112	0.07	62	0.69	-27	
		0.5	0.30	-107	3.73	95	0.09	62	0.62	-30	
		0.7	0.26	-125	2.79	84	0.12	62	0.59	-34	
		0.9	0.24	-140	2.26	76	0.14	61	0.58	-38	
		1.2	0.24	-158	1.78	65	0.17	60	0.58	-45	
		1.5	0.23	-172	1.49	55	0.20	60	0.58	-51	
		2.0	0.23	156	1.17	43	0.24	60	0.56	-61	
		2.5	0.25	133	0.98	33	0.29	59	0.54	-72	
		3.0	0.29	105	0.85	26	0.34	58	0.50	-83	
	-10	-10	0.1	0.42	-55	11.54	138	0.03	71	0.84	-18
			0.3	0.28	-108	5.81	104	0.06	66	0.64	-25
			0.5	0.25	-132	3.72	90	0.08	67	0.59	-28
			0.7	0.25	-148	2.77	81	0.11	66	0.58	-32
			0.9	0.25	-162	2.23	73	0.13	66	0.57	-37
			1.2	0.26	-177	1.74	62	0.16	65	0.57	-43
			1.5	0.26	170	1.46	54	0.19	65	0.57	-50
			2.0	0.27	142	1.14	41	0.24	65	0.56	-60
			2.5	0.30	122	0.95	32	0.29	64	0.53	-73
			3.0	0.34	97	0.82	26	0.35	61	0.50	-83
	-15	-15	0.1	0.24	-90	6.83	129	0.02	69	0.80	-12
			0.3	0.24	-136	3.17	107	0.05	70	0.72	-19
			0.5	0.27	-153	2.23	96	0.08	69	0.69	-26
			0.7	0.29	-167	1.75	86	0.10	70	0.66	-32
			0.9	0.31	-178	1.47	77	0.12	70	0.65	-38
			1.2	0.32	168	1.20	65	0.15	70	0.64	-46
			1.5	0.32	155	1.03	56	0.18	72	0.63	-53
			2.0	0.34	130	0.83	44	0.24	71	0.60	-65
			2.5	0.36	111	0.71	36	0.31	68	0.57	-78
			3.0	0.41	89	0.64	31	0.37	64	0.51	-90
-10	-5.0	0.1	0.65	-33	9.36	149	0.03	74	0.92	-14	
		0.3	0.42	-73	5.77	114	0.06	64	0.72	-25	
		0.5	0.31	-95	3.91	98	0.09	63	0.65	-29	
		0.7	0.26	-111	2.94	87	0.11	63	0.62	-32	
		0.9	0.24	-126	2.39	78	0.14	62	0.61	-37	
		1.2	0.23	-144	1.87	67	0.17	60	0.60	-43	
		1.5	0.21	-159	1.58	58	0.19	60	0.60	-49	
		2.0	0.20	166	1.24	46	0.23	60	0.58	-58	
		2.5	0.21	141	1.04	35	0.27	59	0.56	-69	
		3.0	0.25	109	0.90	28	0.32	59	0.52	-79	
	-10	-10	0.1	0.49	-46	12.33	141	0.03	71	0.87	-17
			0.3	0.30	-91	6.45	107	0.06	67	0.66	-24
			0.5	0.25	-114	4.19	93	0.08	67	0.61	-27
			0.7	0.23	-132	3.10	83	0.11	66	0.59	-31
			0.9	0.22	-147	2.50	75	0.13	65	0.58	-35
			1.2	0.23	-164	1.96	65	0.16	64	0.58	-41
			1.5	0.23	-178	1.63	57	0.18	65	0.58	-47
			2.0	0.23	150	1.27	44	0.23	65	0.57	-57
			2.5	0.25	128	1.06	35	0.28	64	0.55	-67
			3.0	0.30	101	0.92	27	0.33	62	0.51	-78
	-15	-15	0.1	0.38	-57	12.51	135	0.02	71	0.84	-17
			0.3	0.25	-107	5.97	103	0.05	69	0.66	-21
			0.5	0.23	-130	3.84	90	0.08	69	0.63	-25
			0.7	0.23	-147	2.84	81	0.10	68	0.61	-29
			0.9	0.24	-161	2.29	74	0.12	67	0.61	-34
			1.2	0.26	-177	1.80	64	0.15	68	0.60	-41
			1.5	0.26	170	1.50	55	0.18	68	0.61	-47
			2.0	0.27	141	1.17	43	0.23	69	0.59	-57
			2.5	0.29	120	0.97	34	0.28	67	0.57	-68
			3.0	0.34	96	0.84	27	0.34	64	0.53	-79

Table 1. Common Emitter S-Parameters