

# The RF Line

## PNP Silicon

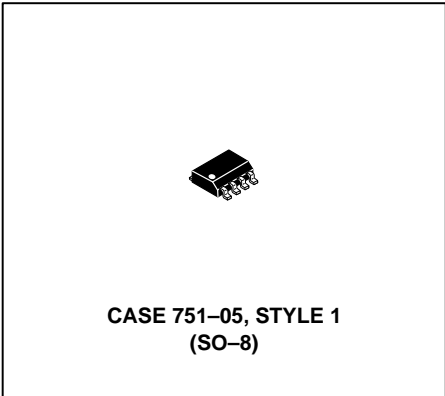
### High-Frequency Transistor

... designed for amplifier, oscillator or frequency multiplier applications in industrial equipment. Suitable for use as a Class A, B or C output driver or pre-driver stages in VHF and UHF.

- Low Cost SORF Plastic Surface Mount Package
- Guaranteed RF Specification —  $|S_{21}|^2$
- S-Parameter Characterization
- Tape and Reel Packaging Options Available by adding suffix:  
R1 suffix = 500 units per reel  
R2 suffix = 2,500 units per reel



**I<sub>C</sub> = -500 mA**  
**SURFACE MOUNT**  
**HIGH-FREQUENCY**  
**TRANSISTOR**  
**PNP SILICON**



#### MAXIMUM RATINGS

Rating	Symbol	Value	Unit
Collector-Emitter Voltage	V <sub>CEO</sub>	-30	V
Collector-Base Voltage	V <sub>CBO</sub>	-30	V
Emitter-Base Voltage	V <sub>EBO</sub>	-3.0	V
Collector Current — Continuous	I <sub>C</sub>	-500	mA
Operating and Storage Junction Temperature Range	T <sub>J</sub> , T <sub>stg</sub>	-55 to +150	°C

#### DEVICE MARKING

MRF5583 = 5583
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#### THERMAL CHARACTERISTICS

Characteristic	Symbol	Max	Unit
Total Device Dissipation @ T <sub>A</sub> = 25°C Derate above 25°C	P <sub>D</sub>	1.0 8.0	Watt mW/°C
Storage Temperature	T <sub>stg</sub>	150	°C
Thermal Resistance, Junction to Ambient	R <sub>θJA</sub>	125	°C/W

#### ELECTRICAL CHARACTERISTICS (T<sub>C</sub> = 25°C unless otherwise noted.)

Characteristic	Symbol	Min	Typ	Max	Unit
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#### OFF CHARACTERISTICS

Collector-Emitter Breakdown Voltage (I <sub>C</sub> = -10 mA)	V <sub>(BR)CEO</sub>	-30	—	—	V
Collector-Base Breakdown Voltage (I <sub>C</sub> = -10 μA)	V <sub>(BR)CBO</sub>	-30	—	—	V
Emitter-Base Breakdown Voltage (I <sub>E</sub> = -100 μA)	V <sub>(BR)EBO</sub>	-3	—	—	V
Collector Cutoff Current (V <sub>CB</sub> = -20 V)	I <sub>CBO</sub>	—	—	-1.0	μA
Emitter Cutoff Current (V <sub>EB</sub> = -2.0 V)	I <sub>EBO</sub>	—	—	-0.5	μA

#### ON CHARACTERISTICS

DC Current Gain (I <sub>C</sub> = -40 mA, V <sub>CE</sub> = -2.0 V) (I <sub>C</sub> = -100 mA, V <sub>CE</sub> = -2.0 V) (I <sub>C</sub> = -300 mA, V <sub>CE</sub> = -5.0 V)	h <sub>FE</sub>	20 25 15	— — —	— 100 —	—
Collector-Emitter Saturation Voltage (I <sub>C</sub> = -100 mA, I <sub>B</sub> = -10 mA)	V <sub>CE(sat)</sub>	—	—	0.8	V
Base-Emitter On Voltage (I <sub>C</sub> = -100 mA, V <sub>CE</sub> = -2.0 V)	V <sub>BE(on)</sub>	—	—	1.8	V

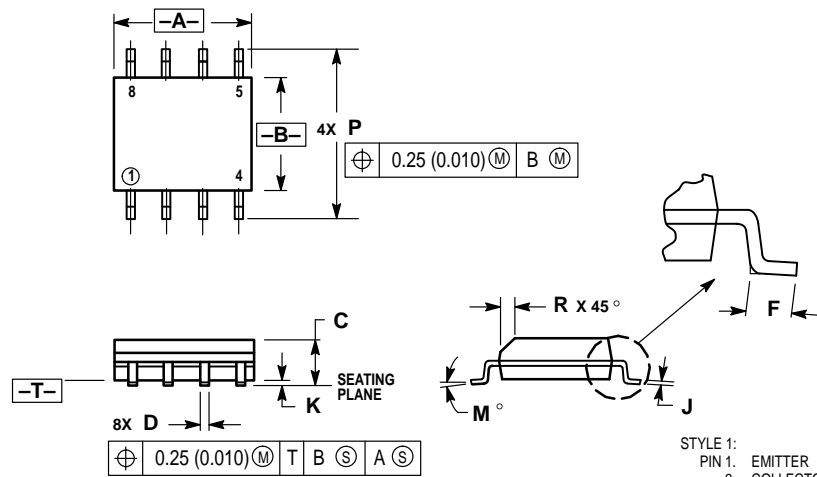
#### SMALL-SIGNAL CHARACTERISTICS

Current-Gain — Bandwidth Product (I <sub>C</sub> = -35 mA, V <sub>CE</sub> = -15 V, f = 100 MHz)	f <sub>T</sub>	—	2100	—	MHz
Insertion Gain (V <sub>CE</sub> = -15 V, I <sub>C</sub> = -35 mA, f = 250 MHz)	S <sub>21</sub>   <sup>2</sup>	12.5	15.5	—	dB

V <sub>CE</sub> (Volts)	I <sub>C</sub> (mA)	f (MHz)	S <sub>11</sub>		S <sub>21</sub>		S <sub>12</sub>		S <sub>22</sub>	
			S <sub>11</sub>	∠	S <sub>21</sub>	∠	S <sub>12</sub>	∠	S <sub>22</sub>	∠
-15	-35	10	0.47	-57	64.7	155	0.01	60	0.83	-26
		30	0.59	-116	42.2	126	0.02	44	0.56	-58
		50	0.63	-140	28.8	113	0.02	39	0.39	-74
		70	0.64	-151	21.4	105	0.02	42	0.30	-82
		100	0.65	-161	15.4	97	0.02	45	0.24	-80
		300	0.67	179	5.23	79	0.05	58	0.13	-109
		500	0.67	168	3.11	66	0.07	60	0.20	-114
		700	0.67	160	2.24	57	0.09	60	0.24	-116
		1000	0.66	146	1.54	44	0.13	60	0.30	-123

Table 1. Common Emitter S-Parameters


# PACKAGE DIMENSIONS



- NOTES:
1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.
  2. CONTROLLING DIMENSION: MILLIMETER.
  3. DIMENSIONS A AND B DO NOT INCLUDE MOLD PROTRUSION.
  4. MAXIMUM MOLD PROTRUSION 0.15 (0.006) PER SIDE.
  5. DIMENSION D DOES NOT INCLUDE DAMBAR PROTRUSION. ALLOWABLE DAMBAR PROTRUSION SHALL BE 0.127 (0.005) TOTAL IN EXCESS OF THE D DIMENSION AT MAXIMUM MATERIAL CONDITION.

- STYLE 1:
1. PIN 1. EMITTER
  2. COLLECTOR
  3. COLLECTOR
  4. EMITTER
  5. EMITTER
  6. BASE
  7. BASE
  8. EMITTER

**CASE 751-05  
ISSUE M**

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MRF5583/D

