

**The RF Line**  
**NPN 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

**MRFQ17**  
 DIE SOURCE SAME AS  
 BFQ17

**$I_C = 300$  mA**  
**SURFACE MOUNT**  
**HIGH FREQUENCY**  
**TRANSISTOR**  
**NPN SILICON**



**MAXIMUM RATINGS**

Rating	Symbol	Value	Unit
Collector-Emitter Voltage	$V_{CEO}$	25	V
Collector-Base Voltage	$V_{CBO}$	40	V
Emitter-Base Voltage	$V_{EBO}$	2	V
Collector Current — Continuous	$I_C$	300	mA
Operating and Storage Junction Temperature Range	$T_J, T_{stg}$	-55 to +150	°C

**THERMAL CHARACTERISTICS**

Characteristic	Symbol	Max	Unit
Total Device Dissipation, $T_A = 25^\circ\text{C}$ Derate above $25^\circ\text{C}$	$P_D$	1 8	Watt mW/°C
Storage Temperature	$T_{stg}$	150	°C
Thermal Resistance Junction to Ambient	$R_{\theta JA}$	125	°C/W

**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 ( $I_C = 10$ mA)	$V_{(BR)CEO}$	25	—	—	V
Collector-Base Breakdown Voltage ( $I_C = 100$ $\mu\text{A}$ )	$V_{(BR)CBO}$	40	—	—	V
Emitter-Base Breakdown Voltage ( $I_E = 100$ $\mu\text{A}$ )	$V_{(BR)EBO}$	2	—	—	V
Collector Cutoff Current ( $V_{CB} = 20$ V)	$I_{CBO}$	—	—	100	nA
Emitter Cutoff Current ( $V_{EB} = 1$ V)	$I_{EBO}$	—	—	100	nA

(continued)

# MRFQ17

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

Characteristic	Symbol	Min	Typ	Max	Unit
<b>ON CHARACTERISTICS</b>					
DC Current Gain (I <sub>C</sub> = 50 mA, V <sub>CE</sub> = 5 V) (I <sub>C</sub> = 150 mA, V <sub>CE</sub> = 5 V)	h <sub>FE</sub>	25	—	200	—
		25	—	200	—
Collector-Emitter Saturation Voltage (I <sub>C</sub> = 100 mA, I <sub>B</sub> = 10 mA)	V <sub>CE(sat)</sub>	—	—	0.5	V
<b>SMALL-SIGNAL CHARACTERISTICS</b>					
Current-Gain — Bandwidth Product (I <sub>C</sub> = 50 mA, V <sub>CE</sub> = 12.5 V, f = 500 MHz)	f <sub>T</sub>	—	2250	—	MHz
Insertion Gain (V <sub>CE</sub> = 12.5 V, I <sub>C</sub> = 50 mA, f = 500 MHz)	S <sub>21</sub>   <sup>2</sup>	10	12.2	—	dB

## COMMON EMITTER S-PARAMETERS

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>	∠φ	S <sub>21</sub>	∠φ	S <sub>12</sub>	∠φ	S <sub>22</sub>	∠φ
12.5	50	10	0.32	-72	38.2	165	0.005	47	0.97	-13
		20	0.36	-103	37.8	151	0.007	48	0.88	-23
		50	0.60	-139	33.0	124	0.013	40	0.62	-42
		75	0.66	-152	25.0	112	0.014	36	0.49	-47
		100	0.69	-159	19.6	105	0.016	38	0.43	-49
		200	0.72	-174	10.3	91	0.021	47	0.32	-51
		500	0.72	168	4.1	68	0.040	65	0.37	-70
		750	0.70	157	2.8	57	0.059	72	0.43	-83
		1000	0.69	146	2.1	45	0.081	76	0.47	-95