

## NTE338F Silicon NPN Transistor RF Power Amp, Driver

**Description:**

The NTE338F is a silicon NPN transistor in a W52K type package designed primarily for use as a power linear amplifier from 2 to 30MHz.

**Features:**

- Specified 12.5V, 30MHz Characteristics:  
 Output Power = 20W (PEP)  
 Minimum Gain = 12dB  
 Efficiency = 45%
- Intermodulation Distortion @ 20W (PEP):  
 IMD = -30dB Min
- 100% Tested for Load Mismatched at all Phase Angle with 30:1 VSWR

**Absolute Maximum Ratings:**

Collector–Emitter Voltage, $V_{CEO}$ .....	20V
Collector–Base Voltage, $V_{CBO}$ .....	40V
Emitter–Base Voltage, $V_{EBO}$ .....	4V
Continuous Collector Current, $I_C$ .....	4A
Withstand Current (t = 5s) .....	12A
Total Device Dissipation ( $T_C = +25^\circ\text{C}$ ), $P_D$ .....	80W
Derate Above $25^\circ\text{C}$ .....	0.46W/ $^\circ\text{C}$
Operating Junction Temperature, $T_J$ .....	+200 $^\circ\text{C}$
Storage Temperature Range, $T_{stg}$ .....	-65 $^\circ$ to +150 $^\circ\text{C}$
Thermal Resistance, Junction–to–Case, $R_{thJC}$ .....	2.2 $^\circ\text{C}/\text{W}$

**Electrical Characteristics:** ( $T_C = +25^\circ\text{C}$  unless otherwise specified)

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
<b>OFF Characteristics</b>						
Collector–Emitter Breakdown Voltage	$V_{(BR)CEO}$	$I_C = 50\text{mA}, I_B = 0$	20	–	–	V
	$V_{(BR)CES}$	$I_C = 50\text{mA}, V_{BE} = 0$	40	–	–	V
Collector–Base Breakdown Voltage	$V_{(BR)CBO}$	$I_C = 50\text{mA}, I_E = 0$	40	–	–	V
Emitter–Base Breakdown Voltage	$V_{(BR)EBO}$	$I_E = 1\text{mA}, I_C = 0$	4	–	–	V
Collector Cutoff Current	$I_{CES}$	$V_{CE} = 12.5\text{V}, V_{BE} = 0$	–	–	5	mA

**Electrical Characteristics (Cont'd):** ( $T_C = +25^\circ\text{C}$  unless otherwise specified)

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
<b>ON Characteristics</b>						
DC Current Gain	$h_{FE}$	$I_C = 1\text{A}, V_{CE} = 5\text{V}$	10	35	–	
<b>Dynamic Characteristics</b>						
Output Capacitance	$C_{ob}$	$V_{CB} = 12.5\text{V}, I_E = 0, f = 1\text{MHz}$	–	15	200	pF
<b>Functional Tests</b> ( $V_{CC} = 12.5\text{V}$ unless otherwise specified)						
Common–Emitter Amplifier Power Gain	$G_{PE}$	$P_{out} = 20\text{W (PEP)}, I_{Cmax} = 1.75\text{A}, I_{CQ} = 25\text{mA}, f = 30, 30.001\text{MHz}$	12	15	–	dB
Power Output	$P_{out}$	$V_{CE} = 12.5\text{V}, f = 30\text{MHz}$	20	–	–	W
Collector Efficiency	$\eta$	$P_{out} = 20\text{W (PEP)}, I_{Cmax} = 1.75\text{A}, I_{CQ} = 25\text{mA}, f = 30, 30.001\text{MHz}$	45	–	–	%
Intermodulation Distortion	IMD	$V_{CE} = 12.5\text{V}, P_{out} = 20\text{W (PEP)}, I_{Cmax} = 1.75\text{A}, I_{CQ} = 25\text{mA}, f = 30, 30.001\text{MHz}$	–	–35	–30	dB
Load Mismatch		$P_{out} = 20\text{W (PEP)}, I_{Cmax} = 1.75\text{A}, I_{CQ} = 25\text{mA}, f = 30, 30.001\text{MHz}$	> 30:1 All Phase Angles			

