NTE312
N–Channel Silicon Junction
Field Effect Transistor

Description:

The NTE312 is a field effect transistor designed for VHF amplifier and mixer applications. The NTE312 comes in a TO–92 package.

Features:

- High Power Gain: 10dB Min at 400MHz
- High Transconductance: 4000 μmho Min at 400MHz
- Low C_{rss}: 1pF Max
- High (Y_{fs}) / C_{iss} Ratio (High–Frequency Figure–of–Merit)
- Drain and Gate Leads Separated for High Maximum Stable Gain
- Cross–Modulation Minimized by Square–Law Transfer Characteristic
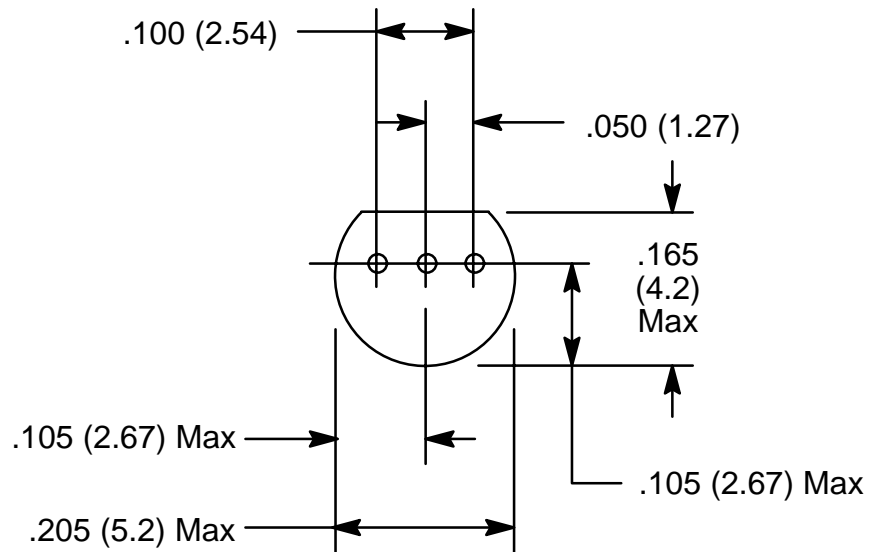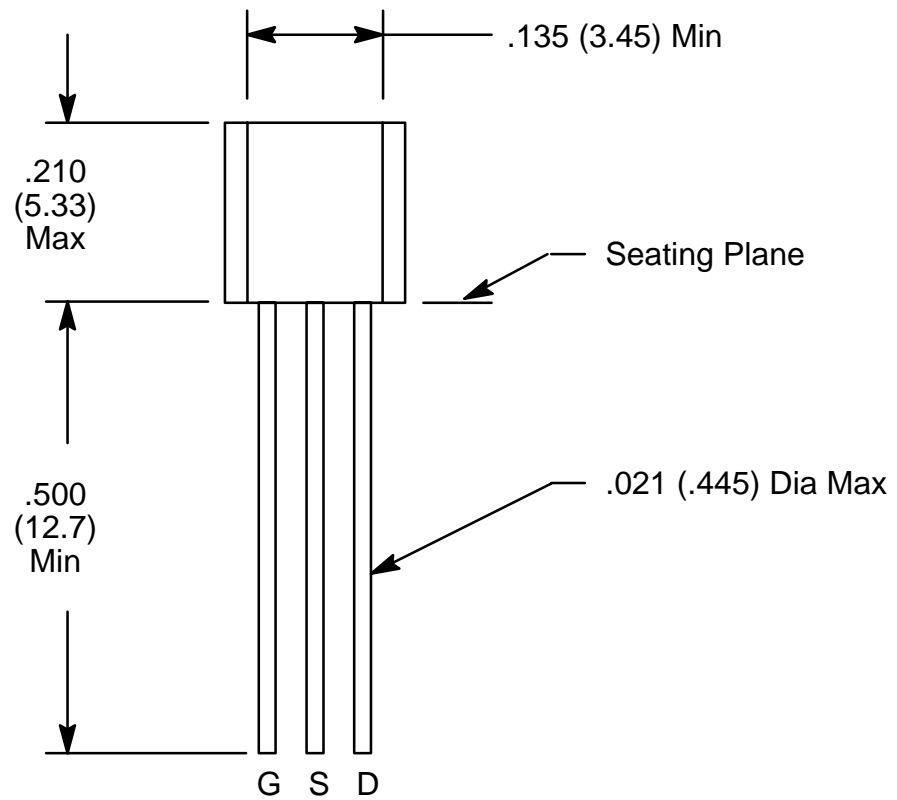- For Use in VHF Amplifiers in FM, TV, and Mobile Communications Equipment

Absolute Maximum Ratings: (T_A = +25°C unless otherwise specified)

Drain–Gate Voltage, V_{DG} 30V

Gate–Source Voltage, V_{GS} . . . . −30V

Gate Current, I_G 50mA

Total Device Dissipation (T_A = +25°C), P_D 360mW
       Derate Above +25°C . . . . 2.88mW/°C

Total Device Dissipation (T_C = +25°C), P_D 500mW
       Derate Above +25°C . . . . 4.0mW/°C

Storage Temperature Range, T_{stg} . . . . −65° to +150°C

Lead Temperature, During Soldering (1/16 Inch from Case for 10sec), T_L . . . . +260°C

Electrical Characteristics: (T_A = +25°C unless otherwise specified)

Parameter	Symbol	Test Conditions		Min	Typ	Max	Unit
OFF Characteristics							
Gate–Source Breakdown Voltage	$V_{(BR)GSS}$	$I_G = -1.0\mu A$, $V_{DS} = 0$		–30	–	–	V
Gate Reverse Current	I_{GSS}	$V_{GS} = -20V$, $V_{DS} = 0$		–	–	–1.0	nA
Gate 1 Leakage Current	I_{G1SS}	$V_{G1S} = -20V$, $V_{DS} = 0$, $T_A = +100°C$		–	–	–0.5	μA
Gate–Source Cutoff Voltage	$V_{GS(off)}$	$V_{DS} = 15V$, $I_D = 10mA$		–1.0	–	–6.0	V
ON Characteristics							
Zero–Gate Voltage Drain Current	I_{DSS}	$V_{DS} = 15V$, $V_{GS} = 0$, Note 1		5.0	–	15	mA
Small–Signal Characteristics							
Forward Transfer Admittance	$|y_{fs}|$	$V_{DS} = 15V$, $V_{GS} = 0$, f = 1kHz		4500	–	7500	μmhos
Input Admittance	$Re(y_{is})$	100MHz	$V_{DS} = 15V$, $V_{GS} = 0$	–	–	100	μmhos
		400MHz		–	–	1000	μmhos
Output Admittance	$|y_{os}|$	$V_{DS} = 15V$, $V_{GS} = 0$, f = 1kHz		–	–	50	μmhos
Output Conductance	$Re(y_{os})$	100MHz	$V_{DS} = 15V$, $V_{GS} = 0$	–	–	75	μmhos
		400MHz		–	–	100	μmhos
Forward Transconductance	$Re(y_{fs})$	$V_{DS} = 15V$, $V_{GS} = 0$, f = 400MHz		4000	–	–	μmhos
Input Capacitance	C_{iss}	$V_{DS} = 15V$, $V_{GS} = 0$, f = 1.0MHz		–	–	4.5	pF
Reverse Transfer Capacitance	C_{rss}	$V_{DS} = 15V$, $V_{GS} = 0$, f = 1.0MHz		–	–	1.0	pF
Input Susceptance	$I_M(Yis)$	100MHz	$V_{DS} = 15V$, $V_{GS} = 0$	–	–	3.0	mmho
		400MHz		–	–	12.0	mmho
Functional Characteristics							
Noise Figure	NF	100MHz	$V_{DS} = 15V$, $I_D = 5mA$, $R'_G = 1k\Omega$	–	–	2.0	dB
		400MHz		–	–	4.0	dB
Common Source Power Gain	G_{ps}	100MHz	$V_{DS} = 15V$, $I_D = 5mA$, $R'_G = 1k\Omega$	18	–	–	dB
		400MHz		10	–	–	dB
Output Susceptance	$I_M(Yos)$	100MHz	$V_{DS} = 15V$, $V_{GS} = 0$	–	–	1000	μmhos
		400MHz		–	–	4000	μmhos

Note 1. tp = 100ms, Duty Cycle = 10%.

.135 (3.45) Min

.210
(5.33)
Max

Seating Plane

.500
(12.7)
Min

.021 (.445) Dia Max

G S D

.100 (2.54)

.050 (1.27)

.165
(4.2)
Max

.105 (2.67) Max

.105 (2.67) Max

.205 (5.2) Max

NOTE: Drain and Source are interchangeable.