

Wireless Bipolar Power Transistor, 4W

1.78 - 1.90 GHz

PH1819-4N

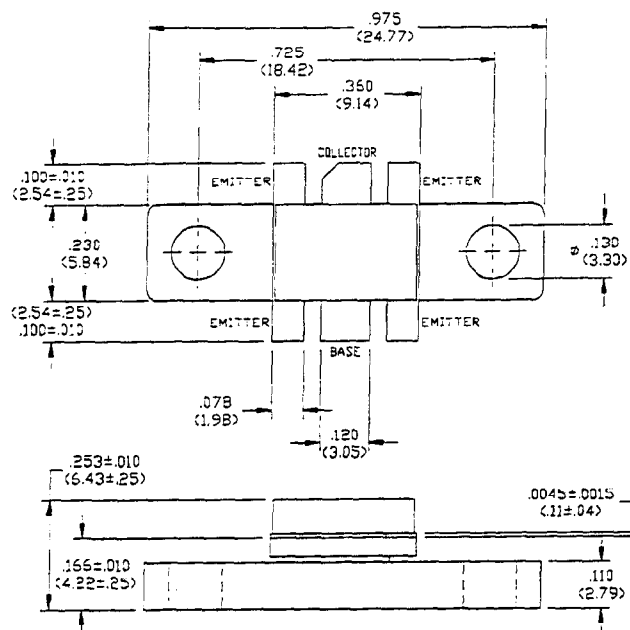
V2.00

Features

- NPN Silicon Microwave Power Transistor
- Designed for Linear Amplifier Applications
- Class AB: -34 dBc Typ 3rd IMD at 4 Watts PEP
- Class A: +44 dBm Typ 3rd Order Intercept Point
- Common Emitter Configuration
- Internal Input Impedance Matching
- Diffused Emitter Ballasting
- Gold Metallization System

Absolute Maximum Ratings at 25°C

Parameter	Symbol	Rating	Units
Collector-Base Voltage	V_{CBO}	60	V
Collector-Emitter Voltage	V_{CES}	60	V
Emitter-Base Voltage	V_{EBO}	3.0	V
Collector Current	I_C	0.7	A
Power Dissipation	P_D	19.5	W
Junction Temperature	T_J	200	°C
Storage Temperature	T_{STG}	-55 to +150	°C
Thermal Resistance	θ_{JC}	7.5	°C/W



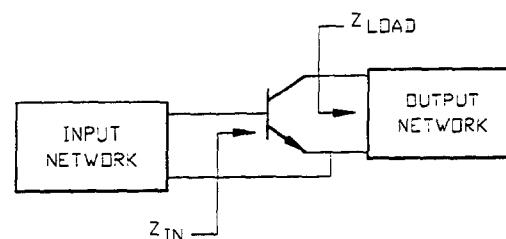
UNLESS OTHERWISE NOTED, TOLERANCES ARE INCHES ±.005" (MILLIMETERS ±.13MM)

Electrical Characteristics at 25°C

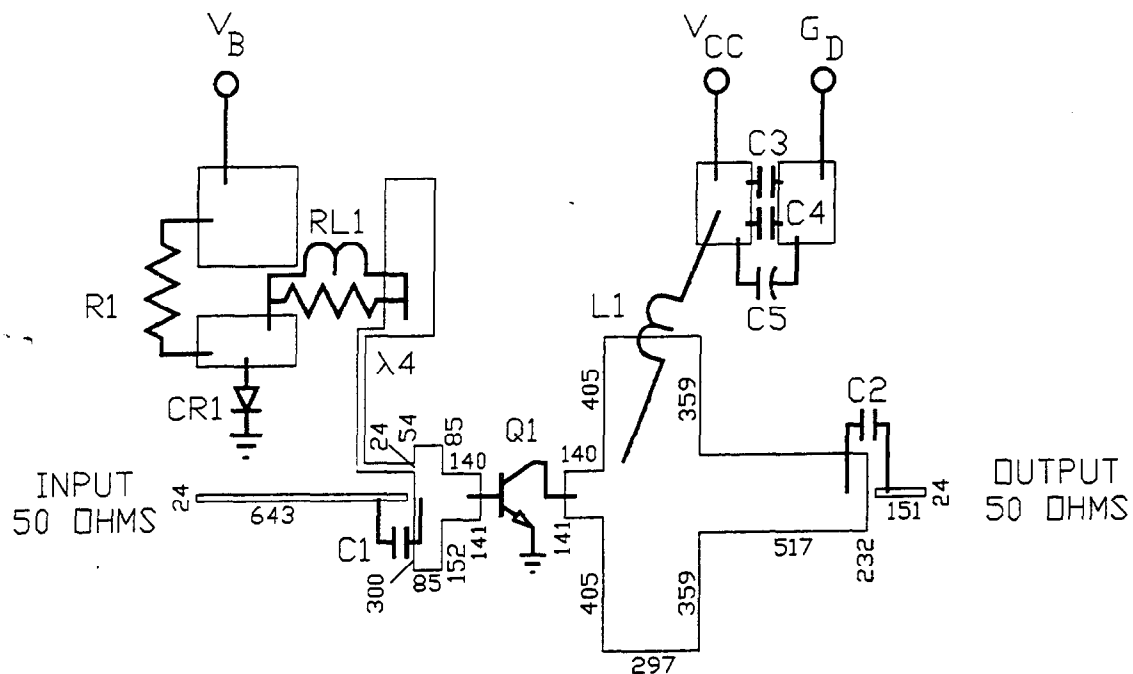
Parameter	Symbol	Min	Max	Units	Test Conditions
Collector-Emitter Breakdown Voltage	BV_{CES}	60	-	V	$I_C=5\text{ mA}$
Collector-Emitter Leakage Current	I_{CES}	-	2.0	mA	$V_{CE}=24\text{ V}$
Collector-Emitter Breakdown Voltage	BV_{CEO}	20	-	V	$I_C=5\text{ mA}$
Emitter-Base Breakdown Voltage	BV_{EBO}	3.0	-	V	$I_E=2.5\text{ mA}$
DC Forward Current Gain	h_{FE}	15	120	-	$V_{CE}=5\text{ V}, I_C=0.1\text{ A}$
Power Gain	G_P	10	-	dB	$V_{CC}=26\text{ V}, I_{CQ}=20\text{ mA}, P_{OUT}=4\text{ W PEP}, F=1850\text{ MHz}, \Delta F=100\text{ kHz}$
Collector Efficiency	η_C	25	-	%	$V_{CC}=26\text{ V}, I_{CQ}=20\text{ mA}, P_{OUT}=4\text{ W PEP}, F=1850\text{ MHz}, \Delta F=100\text{ kHz}$
Input Return Loss	RL	10	-	dB	$V_{CC}=26\text{ V}, I_{CQ}=20\text{ mA}, P_{OUT}=4\text{ W PEP}, F=1850\text{ MHz}, \Delta F=100\text{ kHz}$
Load Mismatch Tolerance	VSWR-T	-	10:1	-	$V_{CC}=26\text{ V}, I_{CQ}=20\text{ mA}, P_{OUT}=4\text{ W PEP}, F=1850\text{ MHz}, \Delta F=100\text{ kHz}$
3rd Order IMD	IMD_3	-	-30	dBc	$V_{CC}=26\text{ V}, I_{CQ}=20\text{ mA}, P_{OUT}=4\text{ W PEP}, F=1850\text{ MHz}, \Delta F=100\text{ kHz}$

Typical Optimum Device Impedances

F(MHz)	$Z_{IN}(\Omega)$	$Z_{LOAD}(\Omega)$
1780	$3.5 + j9.3$	$3.5 + j5.6$
1850	$3.1 + j9.2$	$4.5 + j5.2$
1900	$3.3 + j8.9$	$4.8 + j5.5$



RF Test Fixture



ARTWORK DIMENSIONS IN MILS

PARTS LIST

C1 C2 C3	33 pF ATC SIZE A
C4	5000 pF CHIP
C5	50 uF 50 VOLTS
CR1	1N4245 DIODE
L1	5 TURNS OF NO. 20 AWG ON .160" DIA
R1	4.7 OHMS 1/4 WATT
RL1	7 TURNS OF NO. 24 AWG ON 3 OHM 1/4 WATT
Q1	PH1819-4N
BOARD TYPE:	ROGERS 6010.5 .025" THICK, $E_R = 10.5$

Typical Broadband Performance Curves

