

## NPN SILICON EPITAXIAL TRANSISTOR

### FEATURES

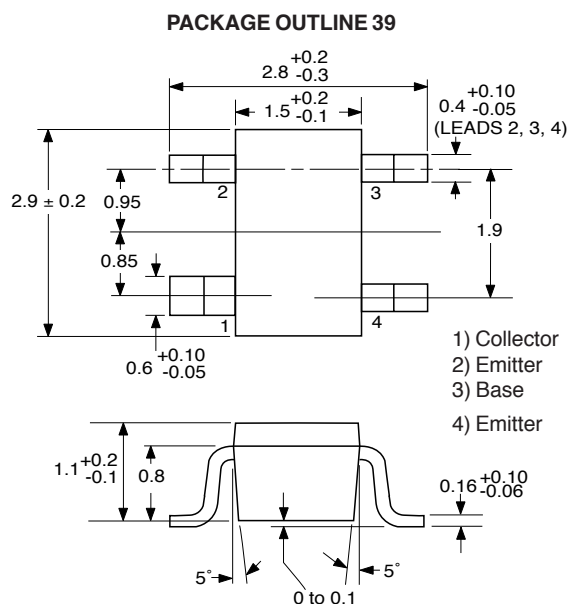
- **OUTPUT POWER AT 1dB COMPRESSION POINT:**  
24.5 dBm TYP @F = 1.9 GHz,  $V_{CE} = 3.6$  V, Class AB,  
Duty 1/8
- **4 PIN MINI MOLD PACKAGE:** NE68939

### DESCRIPTION

The NE68939 is a low voltage, NPN Silicon Bipolar Transistor for pulsed power applications. The device is designed to operate from a 3.6 V supply, and deliver over 1/4 watt of power output at frequencies up to 2.0 GHz with a 1:8 duty cycle. These characteristics make it an ideal device for TX driver stage in a 1.9 GHz digital cordless telephone (DECT or PHS). The part is supplied in a SOT-143 (SC-61) 4-pin Mini-mold package and is available on tape and reel.

The NE68939 transistors are manufactured to stringent quality assurance standards to ensure highest reliability and consistent superior performance.

### OUTLINE DIMENSIONS (Units in mm)



### ELECTRICAL CHARACTERISTICS ( $T_A = 25$ °C)

PART NUMBER		NE68939			
PACKAGE CODE		39			
SYMBOLS	PARAMETERS	UNITS	MIN	TYP	MAX
$I_{CBO}$	Collector Cutoff Current, $V_{CB} = 5$ V, $I_E = 0$	$\mu$ A			2.5
$I_{EBO}$	Emitter Cutoff Current, $V_{EB} = 1$ V, $I_C = 0$	$\mu$ A			2.5
hFE	DC Current Gain, $V_{CE} = 3.6$ V, $I_C = 100$ mA		30		
P-1	Output Power	dBm		24.5	
$G_p$	Power Gain	dB	6.5	8	
$\eta_C$	Collector Efficiency	%	50	62	
$T_{ON}$	Maximum Device On Time	Ms			10.0

*Test Conditions:  $V_{CE} = 3.6$  V,  $f = 1.9$  GHz,  $I_{Cq} = 2$  mA (Class AB), Duty 1/8*

**ABSOLUTE MAXIMUM RATINGS<sup>1</sup>** (T<sub>A</sub> = 25 °C)

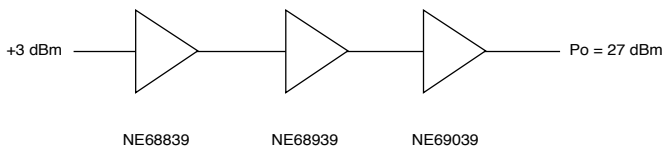
SYMBOLS	PARAMETERS	UNITS	RATINGS
V <sub>CB0</sub>	Collector to Base Voltage	V	9.0
V <sub>CE0</sub>	Collector to Emitter Voltage	V	6.0
V <sub>EB0</sub>	Emitter to Base Voltage	V	2.0
I <sub>C</sub>	Collector Current mA	150	
P <sub>T</sub>	Total Power Dissipation	mW	200 (CW)
T <sub>j</sub>	Junction Temperature	°C	150
T <sub>STG</sub>	Storage Temperature	°C	-65 to +150

Note:

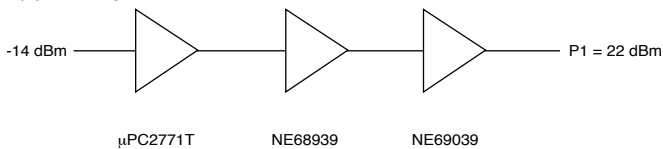
1. Operation in excess of any one of these parameters may result in permanent damage.

**APPLICATION**

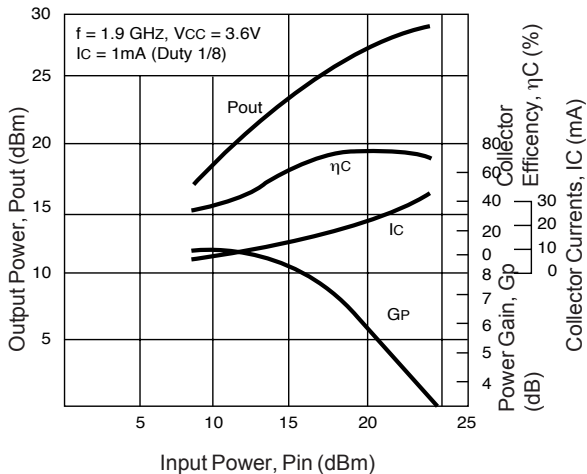
**(1) TX Amplifier for DECT**



**(2) TX Amplifier for PHS**



**OUTPUT POWER, COLLECTOR EFFICIENCY, COLLECTOR CURRENT AND POWER GAIN VS. INPUT POWER**

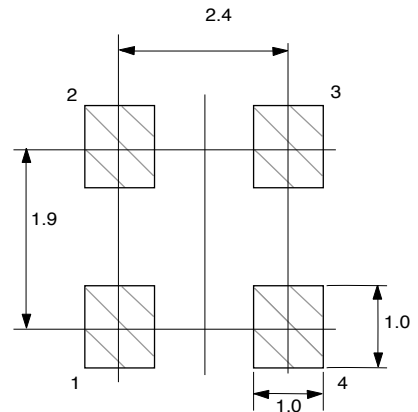


**TYPICAL DATA**

f = 1.9 GHz, V<sub>CC</sub> = 3.6 V, I<sub>CQ</sub> = 1 mA, DUTY = 1/8

P <sub>1dB</sub>	24.5	dbm
η <sub>C</sub>	62	%
I <sub>C</sub>	15	mA
GL	9.0	db

**OUTLINE 39 RECOMMENDED P.C.B. LAYOUT**



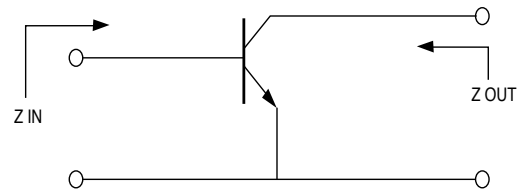
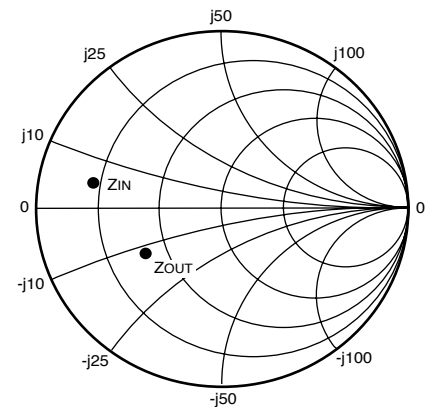
**ORDERING INFORMATION**

PART NUMBER	QTY
NE68939-T1-A	3K/REEL

Note:

1. Lead material: Cu  
Lead plating: PbSn

**Z<sub>IN</sub> (Ω), Z<sub>OUT</sub> (Ω) DATA**



**IMPEDANCE LOOKING INTO DEVICE**

V<sub>CC</sub> = 3.6 V, I<sub>CQ</sub> = 1 mA, CLASS AB

FREQUENCY (GHz)	Z <sub>IN</sub> (Ω)	Z <sub>OUT</sub> (Ω)
1.9	7.85+j5.62	21.9-j11.6
0.9	3.1+j11.6	5.3-j5.7

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