NEC

NPN SILICON EPITAXIAL TRANSISTOR | NE69039

FEATURES

- **OUTPUT POWER AT 1dB COMPRESSION POINT:** 27.5 dBm TYP @F = 1.9 GHz, V_{CE} = 3.6 V, Class AB, Duty 1/8
- **4 PIN MINI MOLD PACKAGE:** NE69039

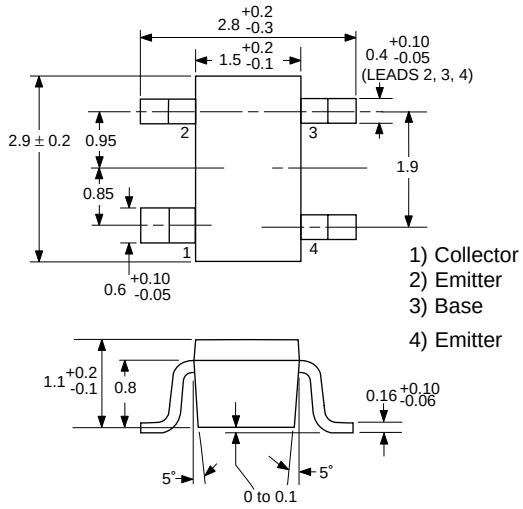
DESCRIPTION

The NE69039 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 1/2 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 output 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 NE69039 transistors are manufactured to NEC's stringent quality assurance standards to ensure highest reliability and consistent superior performance.

OUTLINE DIMENSIONS (Units in mm)

PACKAGE OUTLINE 39



ELECTRICAL CHARACTERISTICS (T_A = 25 °C)

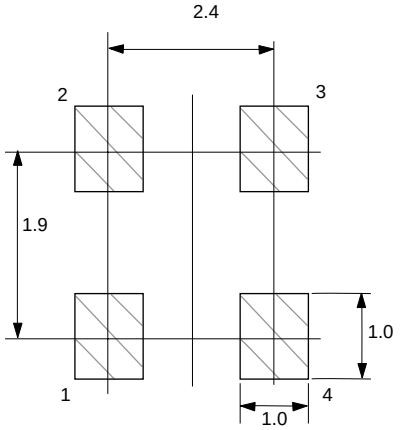
PART NUMBER PACKAGE CODE				NE69039 39		
SYMBOLS	**PARAMETERS**		**UNITS**	**MIN**	**TYP**	**MAX**
I_{CBO}	Collector Cutoff Current, V_{CB} = 5 V, I_E = 0		μA			2.5
I_{EBO}	Emitter Cutoff Current, V_{EB} = 1 V, I_C = 0		μA			2.5
h_{FE}	DC Current Gain, V_{CE} = 3.6 V, I_C = 100 mA			30		
P_{-1}	Output Power	V_{CE} = 3.6 V, f = 1.9 GHz ICq = 1 mA (Class AB) Duty 1/8	dBm		27.5	
G_P	Power Gain		dB	5.0	6.0	
η_C	Collector Efficiency		%	50	72	
T_{ON}	Maximum Device On Time		Ms			10.0

ABSOLUTE MAXIMUM RATINGS[1] (T_A = 25 °C)

SYMBOLS	PARAMETERS	UNITS	RATINGS
V_{CBO}	Collector to Base Voltage	V	9.0
V_{CEO}	Collector to Emitter Voltage	V	6.0
V_{EBO}	Emitter to Base Voltage	V	2.0
I_C	Collector Current	mA	300
P_T	Total Power Dissipation	mW	200 (CW)
T_j	Junction Temperature	°C	150
T_{STG}	Storage Temperature	°C	-65 to +150

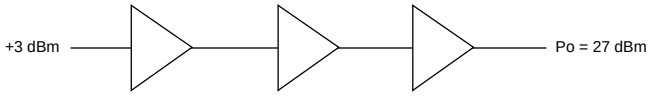
Note:
1. Operation in excess of any one of these parameters may result in permanent damage.

OUTLINE 39
RECOMMENDED P.C.B. LAYOUT



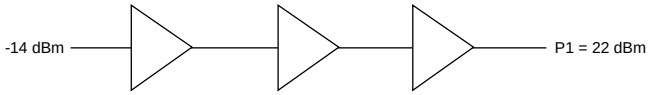
APPLICATION

(1) TX Amplifier for DECT



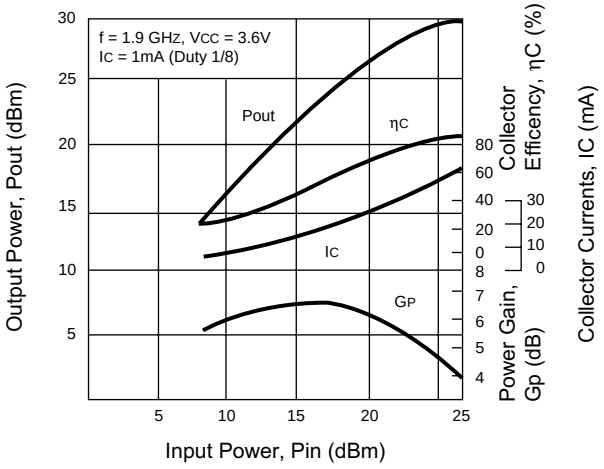
NE68839 NE68939 NE69039

(2) TX Amplifier for PHS



µPC2771T NE68939 NE69039

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

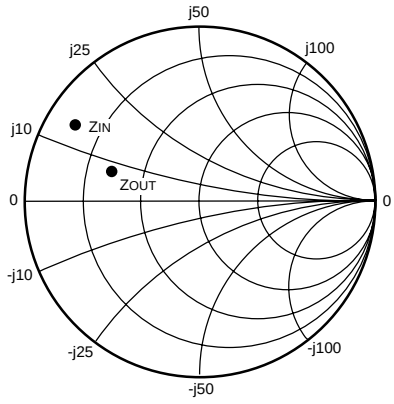


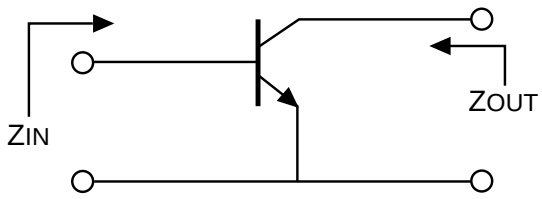
ORDERING INFORMATION

PART NUMBER	QTY
NE69039-T1	3K/REEL

Note:
1. Lead material: Cu
   Lead plating: PbSn

Z_{IN} (Ω), Z_{OUT} (Ω) DATA





TYPICAL DATA
f = 1.9 GHz, V_{CC} = 3.6 V, I_{CQ} = 1 mA, DUTY = 1/8

P_{1dB}	27.5	dBm
η_C	72	%
I_C	27	mA
G_L	6.7	db

IMPEDANCE LOOKING INTO DEVICE
V_{CC} = 3.6 V, I_{CQ} = 1 mA, CLASS AB

FREQUENCY (GHz)	Z_{IN} (Ω)	Z_{OUT} (Ω)
1.9	7.42+j14.2	15.8-j2.64
0.9	4.0+j8.8	4.4-j4.6