CEL

NEC'S NPN SILICON EPITAXIAL TRANSISTOR

NE68939

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

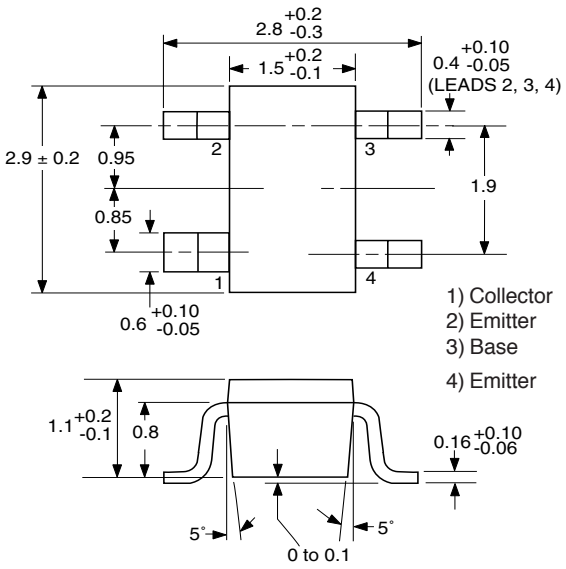
DESCRIPTION

NEC's 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 Minimold package and is available on tape and reel.

The NE68939 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)

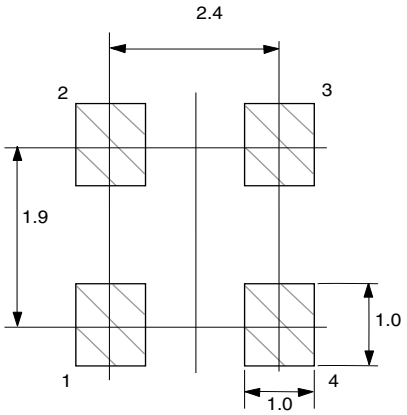
PART NUMBER PACKAGE CODE				NE68939 39		
SYMBOLS	**PARAMETERS**		**UNITS**	**MIN**	**TYP**	**MAX**
I_{CBO}	Collector Cutoff Current, V_{CB} = 5 V, I_E = 0		μA			2.5
I_{EBO}	Emitter Cutoff Current, V_{EB} = 1 V, I_C = 0		μA			2.5
h_{FE}	DC Current Gain, V_{CE} = 3.6 V, I_C = 100 mA			30		
P_{-1}	Output Power	V_{CE} = 3.6 V, f = 1.9 GHz ICq = 2 mA (Class AB) Duty 1/8	dBm		24.5	
G_p	Power Gain		dB	6.5	8	
η_C	Collector Efficiency		%	50	62	
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	150	
P_T	Total Power Dissipation	mW	200 (CW)
T_j	Junction Temperature	°C	150
T_{STG}	Storage Temperature	°C	-65 to +150

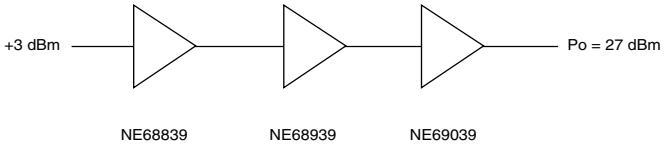
Note:
1. Operation in excess of any one of these parameters may result in permanent damage.

OUTLINE 39
RECOMMENDED P.C.B. LAYOUT

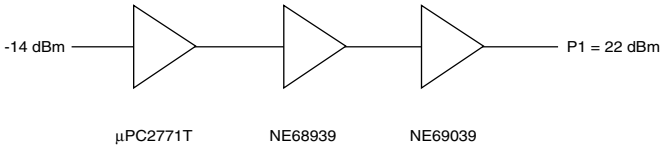


APPLICATION

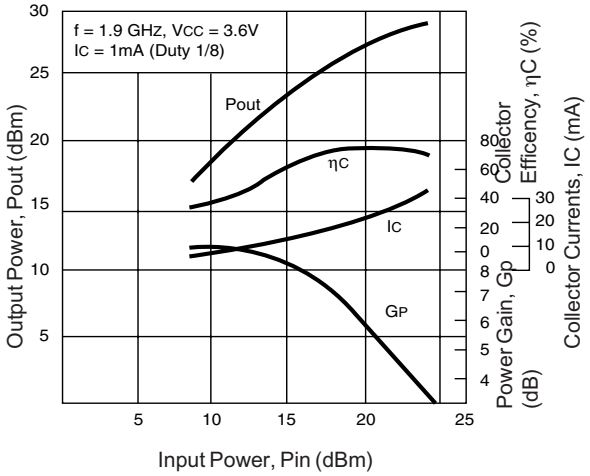
(1) TX Amplifier for DECT



(2) TX Amplifier for PHS



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

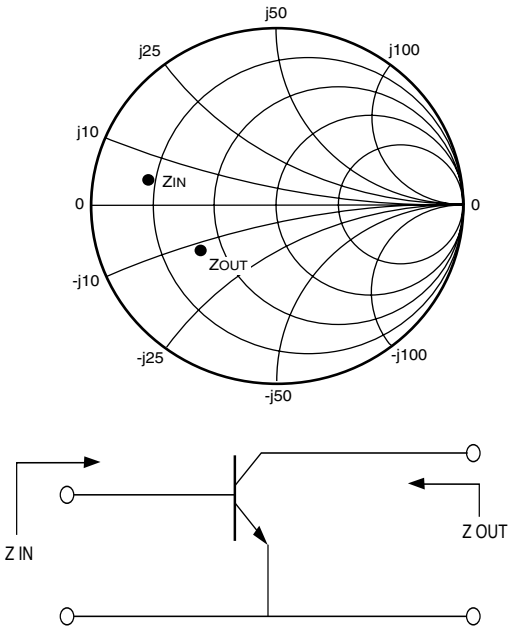


ORDERING INFORMATION

PART NUMBER	QTY
NE68939-T1-A	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}	24.5	dbm
η_C	62	%
I_C	15	mA
G_L	9.0	db

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

FREQUENCY (GHz)	Z_{IN} (Ω)	Z_{OUT} (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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Subject: Compliance with EU Directives

CEL certifies, to its knowledge, that semiconductor and laser products detailed below are compliant with the requirements of European Union (EU) Directive 2002/95/EC Restriction on Use of Hazardous Substances in electrical and electronic equipment (RoHS) and the requirements of EU Directive 2003/11/EC Restriction on Penta and Octa BDE.

CEL Pb-free products have the same base part number with a suffix added. The suffix –A indicates that the device is Pb-free. The –AZ suffix is used to designate devices containing Pb which are exempted from the requirement of RoHS directive (*). In all cases the devices have Pb-free terminals. All devices with these suffixes meet the requirements of the RoHS directive.

This status is based on CEL's understanding of the EU Directives and knowledge of the materials that go into its products as of the date of disclosure of this information.

Restricted Substance per RoHS	Concentration Limit per RoHS (values are not yet fixed)	Concentration contained in CEL devices	
Lead (Pb)	< 1000 PPM	-A	-AZ
		Not Detected	(*)
Mercury	< 1000 PPM	Not Detected	
Cadmium	< 100 PPM	Not Detected	
Hexavalent Chromium	< 1000 PPM	Not Detected	
PBB	< 1000 PPM	Not Detected	
PBDE	< 1000 PPM	Not Detected	

If you should have any additional questions regarding our devices and compliance to environmental standards, please do not hesitate to contact your local representative.

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In no event shall CEL's liability arising out of such information exceed the total purchase price of the CEL part(s) at issue sold by CEL to customer on an annual basis.
See CEL Terms and Conditions for additional clarification of warranties and liability.