KX102-27

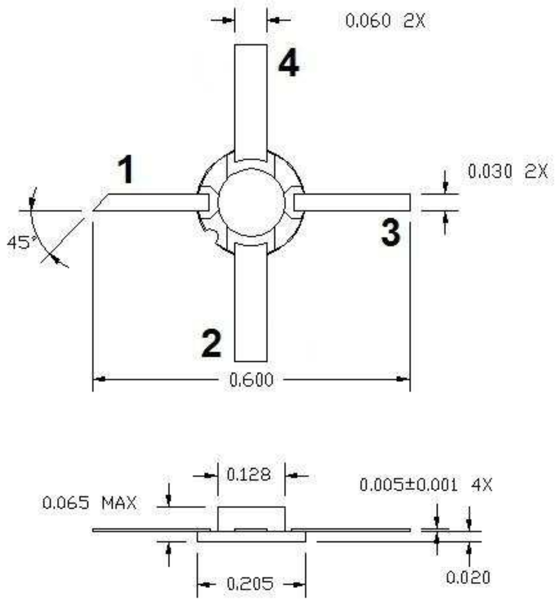
Preliminary 10/2013

KCB SOLUTIONS
RF DESIGN & MANUFACTURING

HIGH FREQUENCY LINEAR POWER TRANSISTOR

Description

The KX102-27 is a high performance NPN silicon bipolar transistor that is designed to be a replacement for the AT64020 Transistor. This device is designed for use in medium power, wide band amplifier and oscillator applications over microwave frequencies. Packaged in a high-conductivity hermetically sealed package, this transistor well suited for high reliability applications.



Features

- ❑ High Output Power:
  - 27.5 dBm typical P1dB at 2.0 GHz
  - 26.5 dBm typical P1dB at 4.0 GHz
- ❑ High Gain at 1dB Compression: 12.5 dB typical at 2.0 GHz
- ❑ 9.5 dB typical G1dB at 4.0 GHz
- ❑ 35% Total Efficiency

Absolute Maximum Rating (+25°C)

Parameter	Symbol	Rating	Units
Collector to Base Voltage	V_{CBO}	40	V
Collector to Emitter Voltage	V_{CEO}	20	V
Emitter to Base Voltage	V_{EBO}	2.0	V
Collector Current	I_C	200	mA
Power Dissipation	P_T	3	W
Junction Temperature	T_J	200	˚C
Storage Temperature	T_{STG}	-65 to +200	˚C

Pinout

1	Base
2	Emitter
3	Collector
4	Emitter

Electrical Characteristics (+25°C)

Parameter	Symbol	Test Conditions	Min	Typ	Max	Units
Insertion Power Gain	$\lvert S_{21E}\rvert^2$	V_{CE} = 16 V, I_C = 110 mA, f = 2 GHz		7		dB
Power Output @ 1dB Gain Compression	P_{1dB}	V_{CE} = 16 V, I_C = 110 mA, f = 2 GHz	26.5	27.5		dBm
1dB Compressed Gain	G_{1dB}	V_{CE} = 16 V, I_C = 110 mA, f = 2 GHz	8.5	10		dB
Total Efficiency at P1dB	η_T	V_{CE} = 16 V, I_C = 20 mA, f = 4 GHz		35		%
Forward Current Transfer Ratio	h_{FE}	V_{CE} = 8 V, I_C = 110 mA	20	50	200	
Collector Cutoff Current	I_{CBO}	V_{CB} = 16 V, I_E = 0 mA			1.0	µA
Emitter Cutoff Current	I_{EBO}	V_{EB} = 1 V, I_C = 0 mA			1.0	µA
Thermal Resistance	Θ_{JC}			40		˚C/W

Typical Performance Curves (+25°C)

Typical performance curves currently being evaluated. Contact KCB Solutions for further Information.

MIL-PRF-19500 Screening Flow

Test Inspection	MIL-STD-750 Method	Condition	JANS	JANTXV	JANTX
Internal Visual Inspection	2070	B	100%	100%	100%
Temperature Cycling	1051	20 cycles	100%	100%	100%
Thermal Impedance	3131		100%	100%	100%
Constant Acceleration	2006	Y1 direction	100%	NA	NA
PIND	2052	A (5 Cycles)	100%	NA	NA
Seal: Fine Leak Gross Leak	1071	A C	100% 100%	100% 100%	100% 100%
Serialization	Per Product Specification		100%	NA	NA
Initial Electrical Test	Per Product Specification	+25°C	100%	NA	NA
High Temp Reverse Bias	1039	A	100%	100%	100%
Interim Electrical Test	Per Product Specification	+25°C	100%	100%	100%
Power Burn In	1039	B	100% 240 hrs min	100% 160 hrs min	100% 160 hrs min
Final Electrical	Per Product Specification	+25°C	100%	100%	100%
PDA Calculation	Per Product Specification		100%	100%	100%
Seal: Fine Leak Gross Leak	1071	A C	100% 100%	100% 100%	100% 100%
Radiography	2076		100%	NA	NA
External Visual	2071		100%	NA	NA
Case Isolation	1081		100%	100%	100%

Ordering Information

KCB Solutions Part Number	Screening Level
KX102-27	Unscreened
KX102-27V	JANTXV Screening
KX102-27X	JANTX Screening
KX102-27S	JANS Screening