

NPN SiGe RF TRANSISTOR

The DRF1601 is a low cost, NPN medium power SiGe HBT(Hetero-Junction Bipolar Transistor) encapsulated in a plastic SOT-223 SMD package.

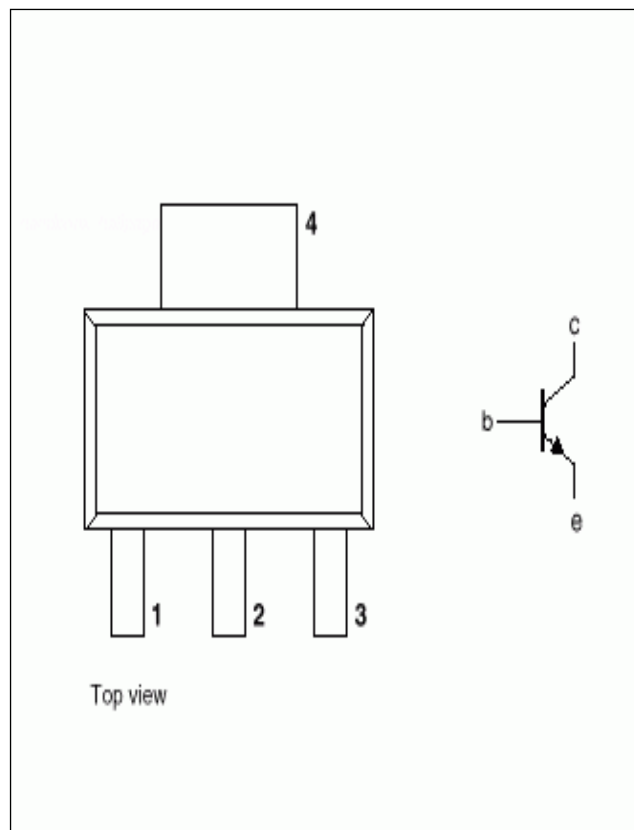
The DRF1601 can be used as a driver device or an output device, depending on the specific application.

FEATURES

- o 6.0 Volt operation
- o P1dB 30 dBm @f=900MHz
- o Power gain 7 dB @f=900MHz

APPLICATIONS

- o Hand-held radio equipment in common emitter class-AB operation in 900 MHz communication band.



PIN CONFIGURATION

PIN NO	SYMBOL	DESCRIPTION
1	E	emitter
2	B	base
3	E	emitter
4	C	collector

MAXIMUM RATINGS

SYMBOL	PARAMETER	CONDITION	VALUE	Unit
V _{CBO}	Collector-Base Voltage	Open Emitter	30	V
V _{CEO}	Collector-Emitter Voltage	Open Base	14	V
V _{EBO}	Emitter-Base Voltage	Open Collector	4	V
I _c	Collector Current (DC)		450	mA
P _T	Total Power Dissipation	T _s = 60 ; note 1	1	W
T _{STG}	Storage Temperature		-65 ~ 150	
T _J	Operating Junction Temperature		150	

THERMAL CHARACTERISTICS

SYMBOL	PARAMETER	CONDITION	VALUE	Unit
Rth j-s	thermal resistance from junction to soldering point	PT=1W; Ts=60 ;note1	55	K/W

* Note 1. Ts is temperature at the soldering point of the collector pin.

QUICK REFERENCE DATA

RF performance at $T_s \leq 60$ in common emitter test circuit (see Fig 7)

Mode of Operation	f [MHz]	V _{CE} [V]	P _L [mW]	G _P [dB]	c [%]
CW, class-AB	900	6.0	1000	7	60

DC CHARACTERISTICS

$T_j=25$ unless otherwise specified

SYMBOL	PARAMETER	CONDITION	MIN.	MAX.	UNIT
BV_{CBO}	collector-base breakdown voltage	open emitter	20		V
BV_{CEO}	collector-emitter breakdown voltage	open base	14		V
BV_{EBO}	emitter-base breakdown voltage	open collector	3		V
I_s	collector leakage current		0.1		mA
h_{FE}	DC current gain		60		
C_{CB}	collector capacitance			4.2	pF

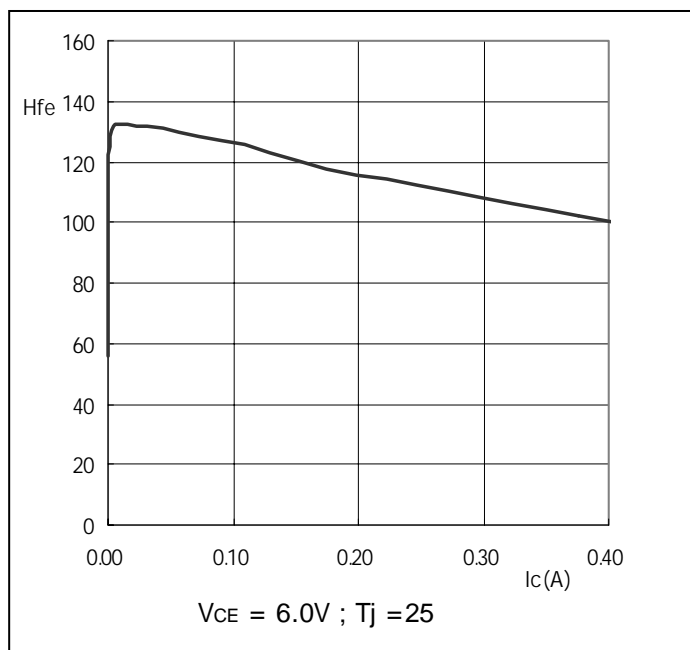


Fig 2. DC Current gain v.s collector current

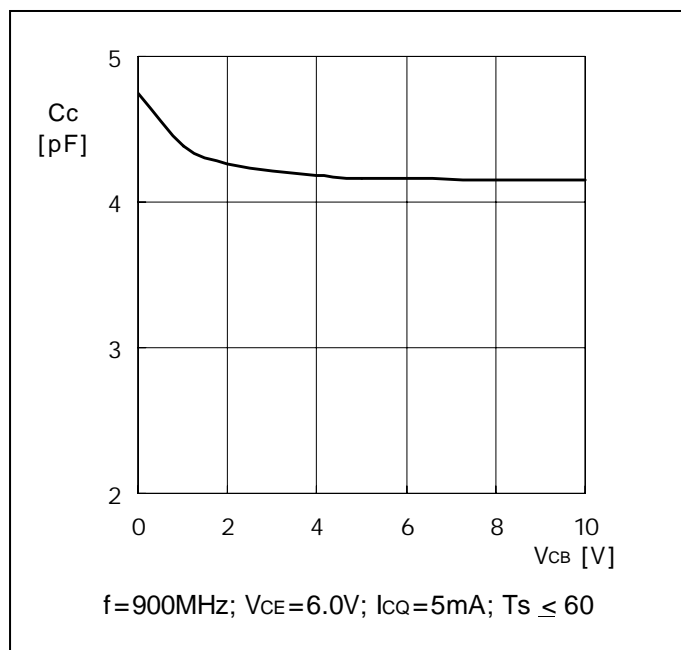


Fig 3. Collector-base capacitance v.s collector-base voltage(DC)

APPLICATION INFORMATION

RF performance at $T_s \leq 60$ in common emitter test circuit (see Fig 7)

Mode of Operation	f [MHz]	V _{CE} [V]	P _L [mW]	G _p [dB]	c [%]
CW, class-AB	900	6	1000	7	70

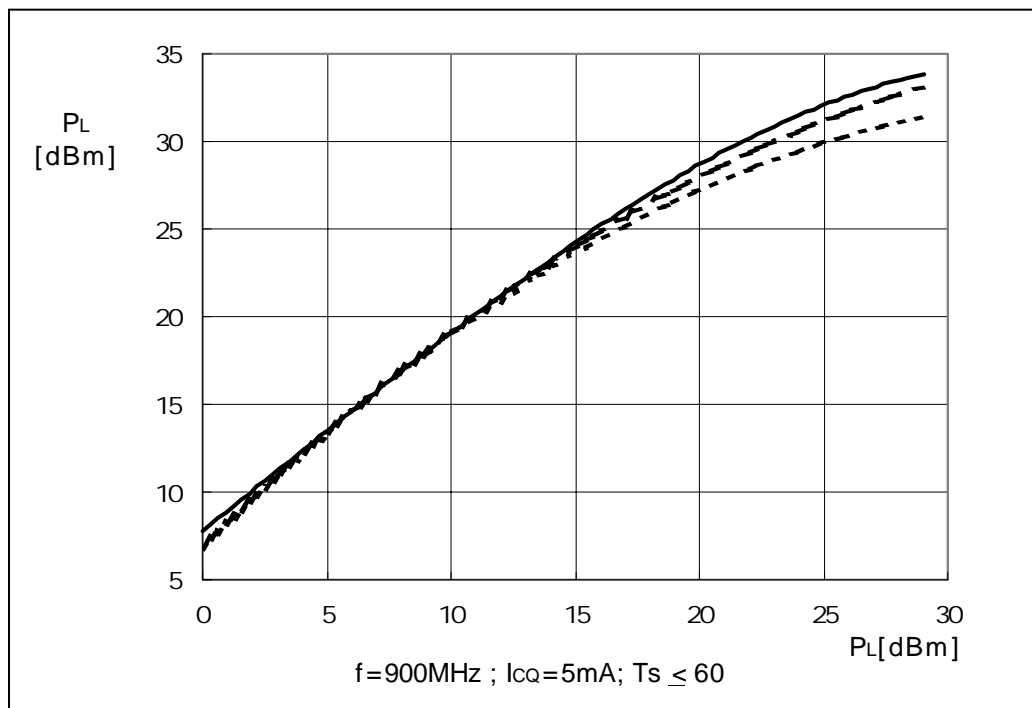


Fig 4. Load Power v.s Input power (typical value)

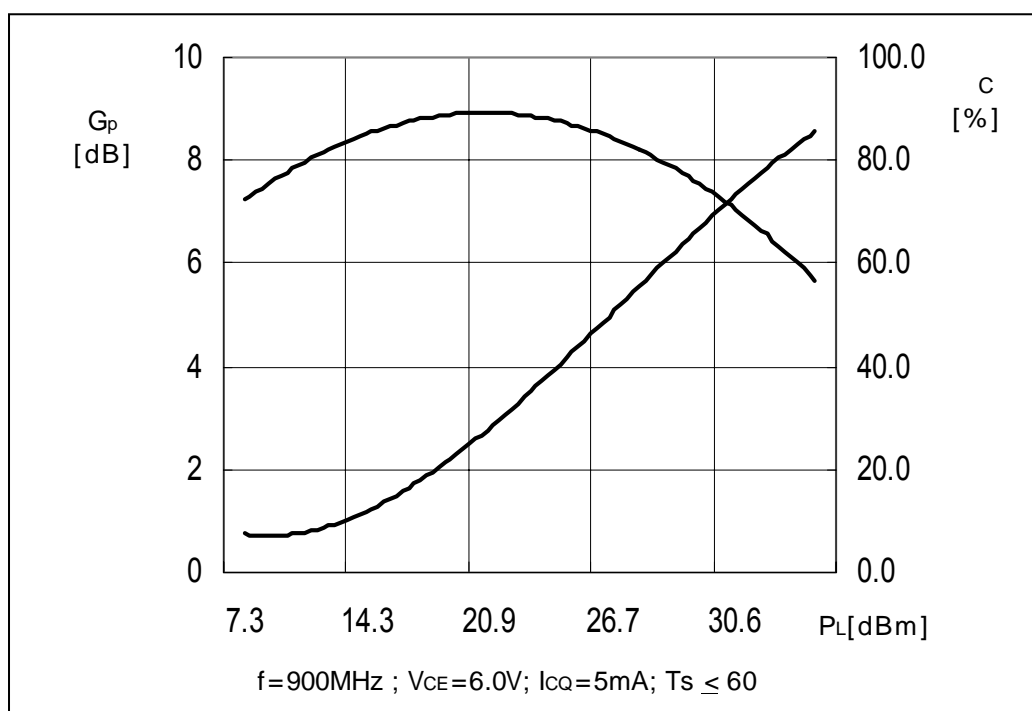


Fig 5. Power gain and collector efficiency v.s load power (typical value)

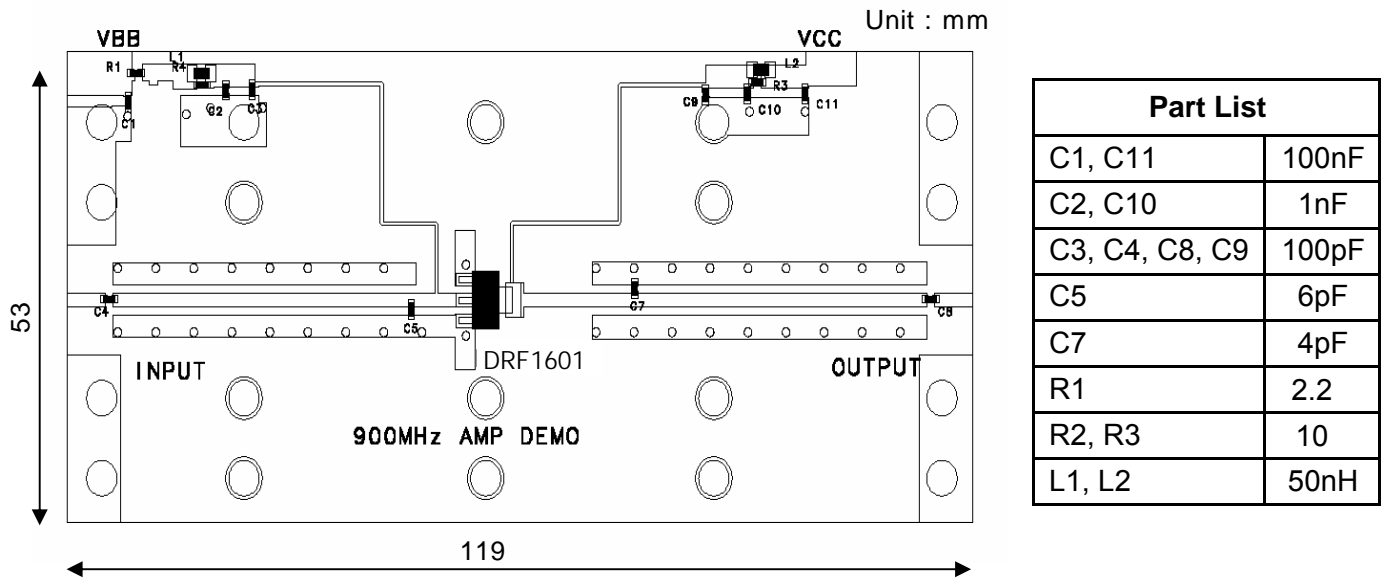


Fig 6. Test Circuit Board Layout @ f = 900MHz

- Test board : FR4 glass epoxy board, dielectric constant = 4.5, thickness = 0.8 mm
- Test condition : CW test, $V_{cc} = 6.0$ V, $I_{cQ} = 5$ mA, frequency = 900 MHz.

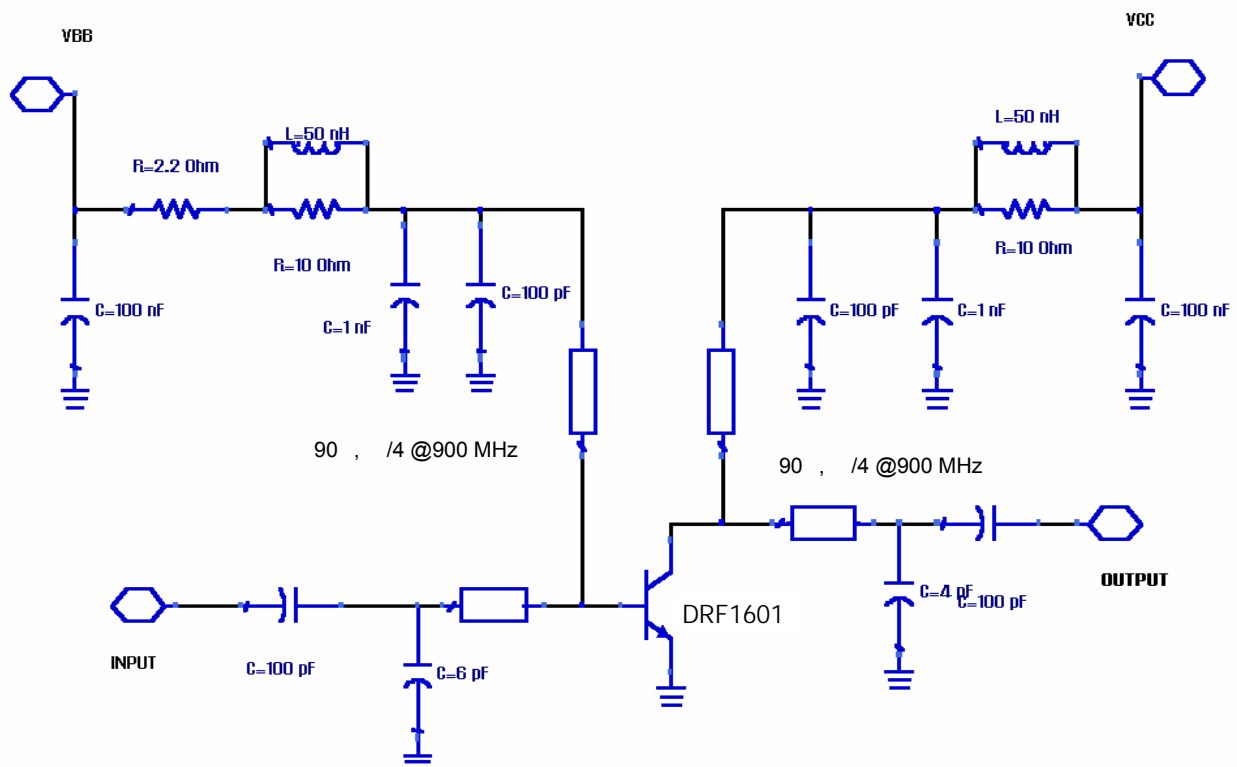
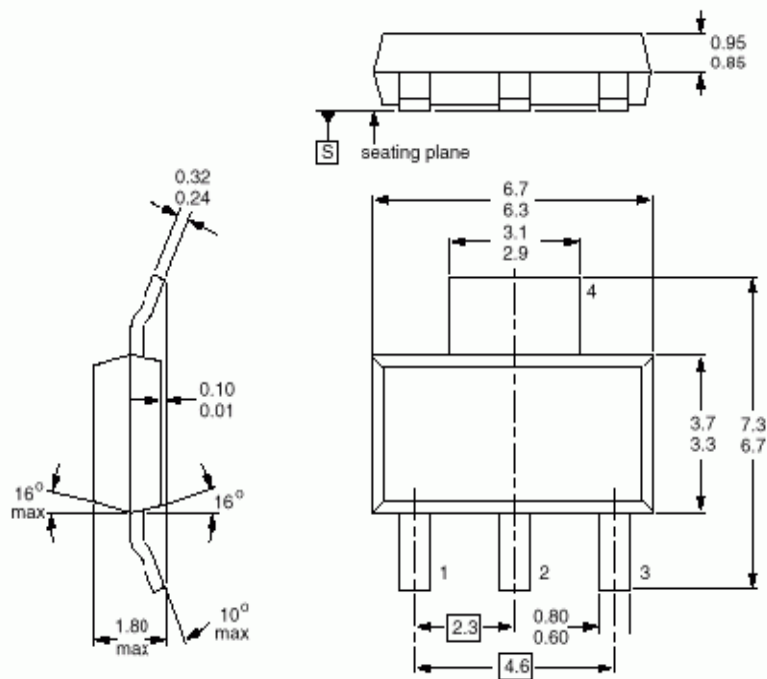


Fig 7. Test Circuit Schematic Diagram @f = 900MHz

PACKAGE DIMENSION



Dimensions in mm.

Fig 8. SOT-223 Package dimension