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DS3626 - 1.1

SL3127

HIGH FREQUENCY NPN TRANSISTOR ARRAY

The SL3127C is a monolithic array of five high frequency low current NPN transistors in a 16 lead DIL package. The transistors exhibit typical f_{Ts} of 1.6GHz and wideband noise figures of 3.6dB. The SL3127C is pin compatible with the CA31 27.

FEATURES

- f_T Typically 1.6GHz
- Wideband Noise Figure 3.6dB
- V_{BE} Matching Better Than 5mV

APPLICATIONS

- Wide Band Amplifiers
- PCM Regenerators
- High Speed Interface Circuits
- High Performance Instrumentation Amplifiers
- High Speed Modems

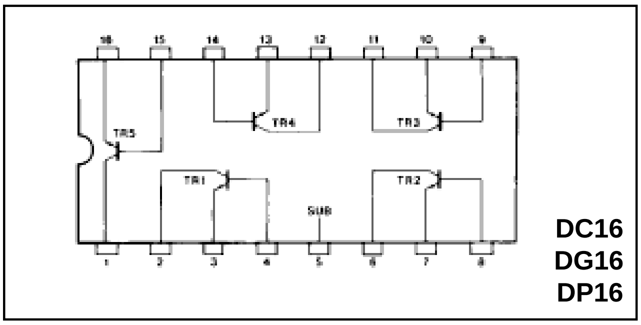

Fig.1 Pin connections SL3127

ORDERING INFORMATION

SL3127 C DC
SL3127 C DP
SL3127 CB DC
SL3127 NA MP

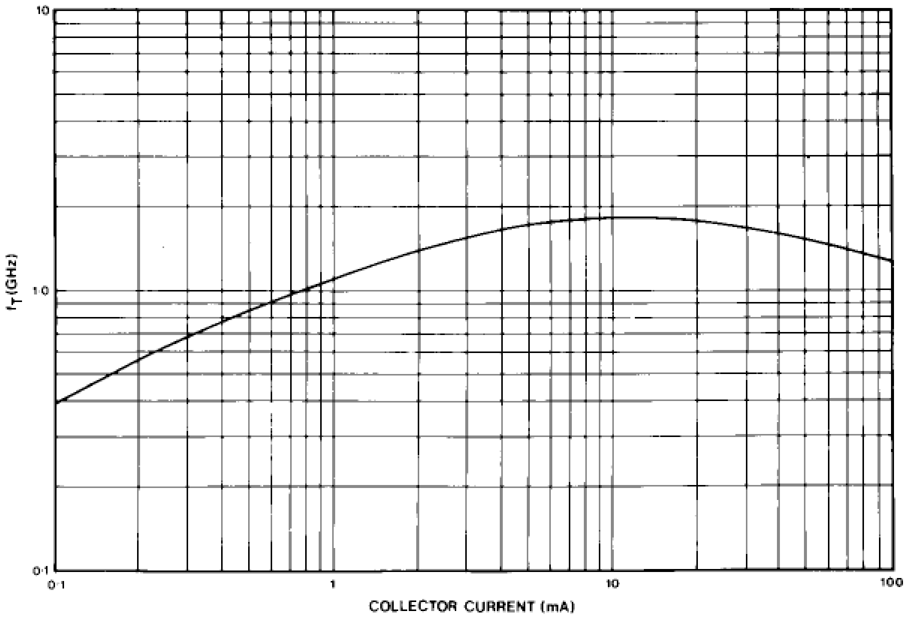

Fig.2 Transition frequency (f_T) v. collector current (V_{CB}= 2V, f=200MHz)

ELECTRICAL CHARACTERISTICS

These characteristics are guaranteed over the following test conditions (unless otherwise stated)

T_{amb} = 22°C ± 2°C

Characteristic	Symbol	Value			Units	Conditions
		Min.	Typ.	Max.		
Static characterisitc						
Collector base breakdown	BV_{CBO}	20	30		V	I_C = 10µA, I_E = 0
Collector emitter breakdown	LV_{CEO}	15	18		V	I_C = 1mA, I_B = 0
Collector substrate breakdown (isolation)	BV_{CIO}	20	55		V	I_C = 10µA, I_R = I_E = 0
Base to isolation breakdown	BV_{BIO}	10	20		V	I_B = 10µA, I_C = I_E = 0
Base emitter voltage	V_{BE}	0.64	0.74	0.84	V	V_{CE} = 6V, I_C = 1mA
Collector emitter saturation voltage	V_{CE}(SAT)		0.26	0.5	V	I_E = 10mA, I_B = 1mA
Emitter base leakage current	I_{EBO}		0.1	1	µA	V_{CE} = 4V
Base emitter saturation voltage	V_{CE}(SAT)		0.95		V	I_E = 10mA, I_B = 1mA
Base emitter voltage difference, all transistors	ΔV_{BE}		0.45	5	mV	V_{CE} = 6V, I_C = 1mA
Input offset current	ΔI_B		0.2	3	µA	V_{CE} = 6V, I_C = 1mA
Temperature coefficient of ΔV_{BE}	$\frac{\partial \Delta V_{BE}}{\partial T}$		2.0		µV/°C	V_{CE} = 6V, I_C = 1mA
Temperature coefficiient of V_{BE}	$\frac{\partial V_{BE}}{\partial T}$		-1.6		mV/°C	V_{CE} = 6V, I_C = 1mA
Static forward current ratio	H_{FE}	35	95			V_{CE} = 6V, I_C = 5mA
		35	100			V_{CE} = 6V, I_C = 0.1mA
		40	100			V_{CE} = 6V, I_C = 1mA
Collector base leakage	I_{CBO}		0.3		nA	V_{CB} = 6V
Collector isolation leakage	I_{CIO}		0.6		nA	V_{CI} = 20V
Base isolation leakage	I_{BIO}		100		nA	V_{BI} = 5V
Emitter base capacitance	C_{EB}		0.4		pF	V_{EB} = 0V
Collector base capacitance	C_{CB}		0.4		pF	V_{CB} = 0V
Collector isolation capacitance	C_{CI}		0.8		pF	V_{CI} = 0V
Dynamic characteristics						
Transition frequency	f_T		1.6		GHz	V_{CE} = 6V, I_C = 5mA
Wideband noise figure	NF		3.6		dB	f = 60MHz } V_{CC} = 6V, I_C = 2mA, R_S = 200Ω
Knee of 1/f noise curve			1		KHz	} V_{CC} = 6V, I_C = 2mA, R_S = 200Ω

ABSOLUTE MAXIMUM RATINGS

The absolute maximum ratings are limiting values above which operating life may be shortened or specified parameters may be degraded.

All electrical ratings apply to individual transistors. Thermal ratings apply to the total package.

The isolation pin (substrate) must be connected to the most negative voltage applied to the package to maintain electrical isolation.

V_{CB} = 20 volt
V_{EB} = 4.0 volt
V_{CE} = 15 volt
V_{CI} = 20 volt
I_C = 20 mA
Maximum individual transistor dissipation 200 mWatt
Storage temperature -55°C to 150°C
Max junction temperature 150°C

Package thermal resistance (°C/watt):-

Package Type	**DC16**	**DP16**
Chip to case	40	
Chip to ambient	120	180

NOTE:
If all the power is being dissipated in one transistor, these thermal resistance figures should be increased by 100°C/watt

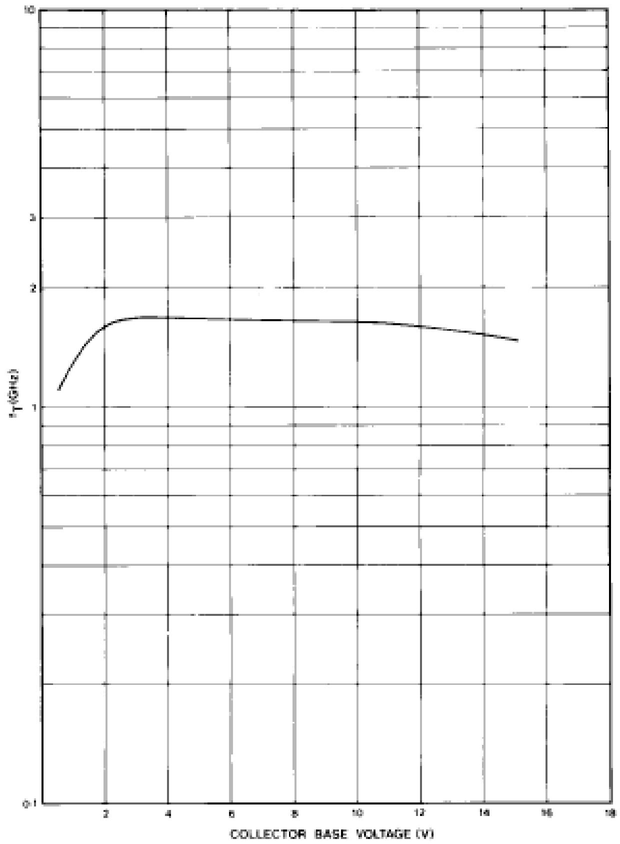

Fig.3 Transition frequency (f_T) v. collector base voltage
(I_C = 5mA, Frequency = 200MHz)

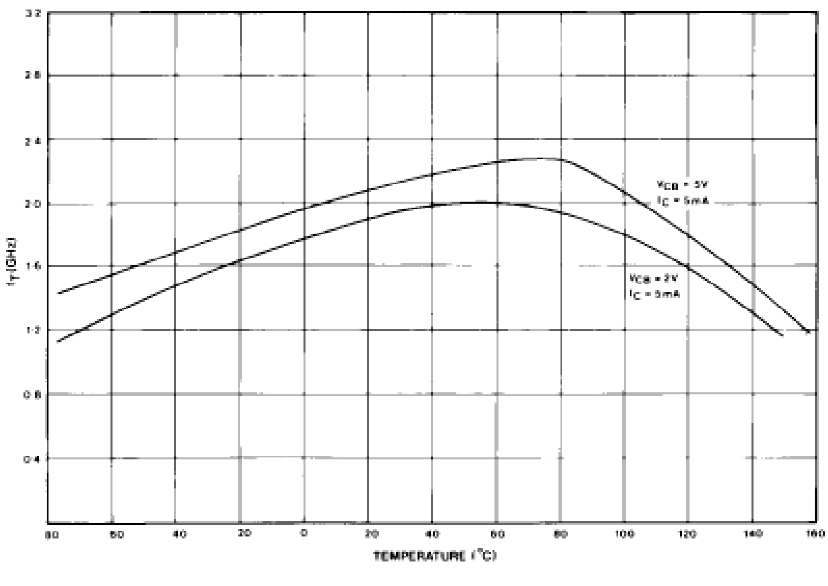

Fig.4 Variation of transition frequency (f_T) with temperature

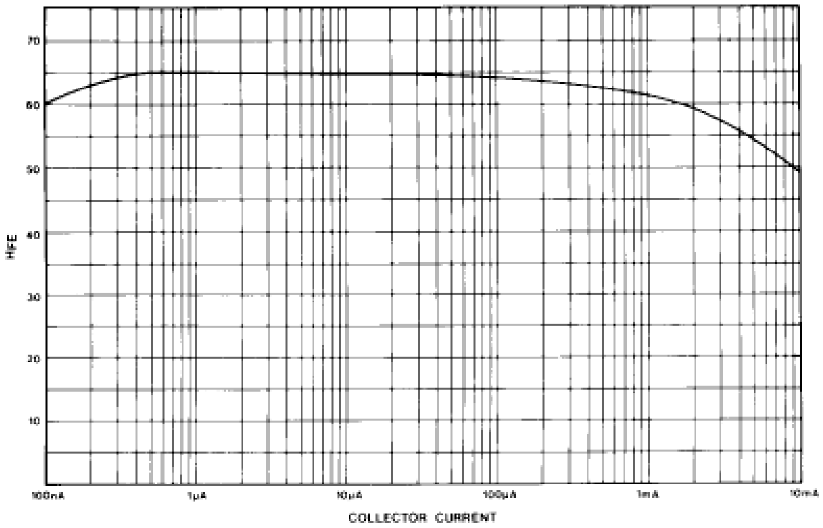

Fig.5 DC current gain v. collector current

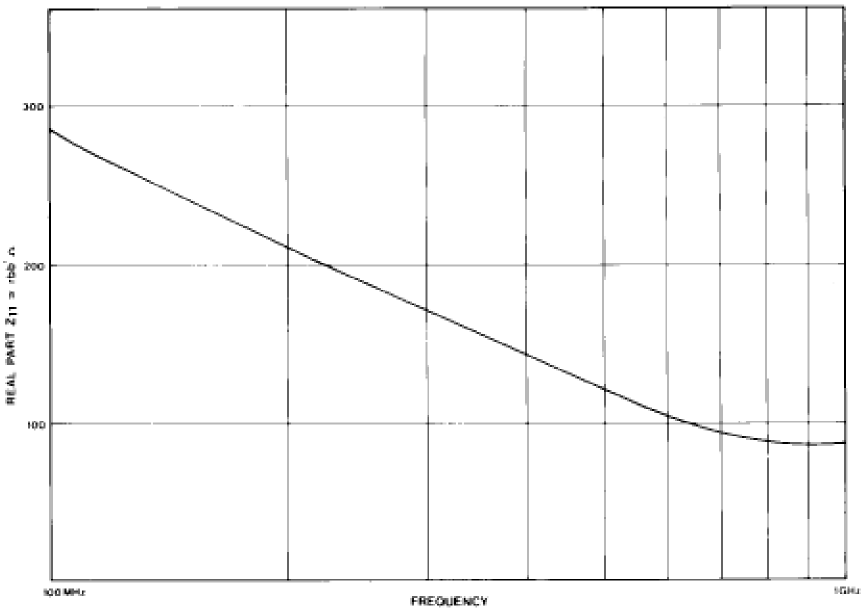

Fig.6 Z_{11} (derived from scattering parameters) v. frequency ($Z_{11} \simeq r_{bb}$)

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