PLESSEY
Semiconductors

SL3127C, SL3145C

HIGH FREQUENCY NPN TRANSISTOR ARRAYS

The SL3127C and SL3145C are monolithic arrays of five high frequency low current NPN transistors. The SL3127C consists of five isolated transistors in a 16 lead DIL package. The SL3145C consists of 3 isolated transistors and a differential pair in a 14 lead DIL package. The transistors exhibit typical f_Ts of 1.6 GHz and wideband noise figures of 3.0dB. The SL3127C is pin compatible with the CA3127 and the SL3145C is pin compatible with the SL3045C.

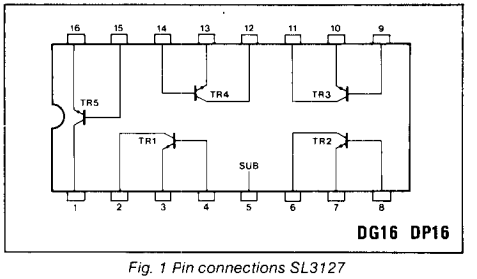

Fig. 1 Pin connections SL3127

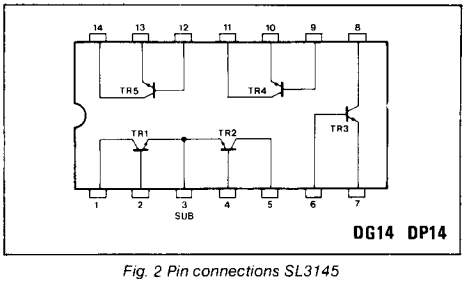

Fig. 2 Pin connections SL3145

FEATURES

- f_T Typically 1.6 GHz
- Wideband Noise Figure 3.0dB
- V_{BE} Matching Better Than 5mV, Guaranteed for SL3145C
- V_{CE}SAT Less Than 0.5V, Guaranteed for SL3127C

APPLICATIONS

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

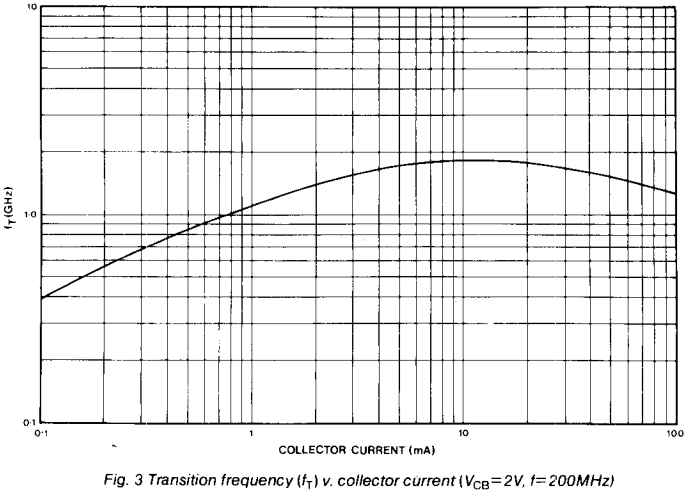

Fig. 3 Transition frequency (f_T) v. collector current (V_{CB}=2V, f=200MHz)

ELECTRICAL CHARACTERISTICS

Test conditions (unless otherwise stated):
Ambient Temperature (T_A): 22°C ± 2°C

Characteristic	Symbol	Device	Value			Units	Conditions
			Min.	Typ.	Max.		
Static characteristics							
Collector base breakdown	BV_{CBO}	SL3127/45	20	30		V	I_C=10μA, I_E=0
Collector emitter breakdown	LV_{CEO}	SL3127/45	15	18		V	I_C=1mA, I_B=0
Collector substrate breakdown (isolation)	BV_{CIO}	SL3127/45	20	55		V	I_C=10μA, I_B=I_E=0
Emitter base breakdown	BV_{EBO}	SL3127/45	5.0			V	I_E=10μA, I_C=0
Base emitter voltage	V_{BE}	SL3127/45	0.64	0.74	0.80	V	V_{CE}=6V, I_C=1mA
Collector emitter saturation voltage	V_{CE}(SAT)	SL3127		0.26	0.5	V	I_C=10mA, I_B=1mA
		SL3145		0.26		V	I_C=10mA, I_B=1mA
Base emitter saturation voltage	V_{BE}(SAT)	SL3127/45		0.95		V	I_C=10mA, I_B=1mA
Base emitter voltage difference, all transistors except TR1, TR2, SL3145	ΔV_{BE}	SL3145		0.45	5	mV	
Base emitter voltage difference all transistors except TR1, TR2, SL3145	ΔV_{BE}	SL3145		0.35	5	mV	
Input offset current (except for TR1, TR2, or SL3145)	ΔI_B	SL3127/45		0.2	3	μA	
Input offset current TR1, TR2, SL3145	ΔI_B	SL3145		0.2	2	μA	V_{CE}=6V, I_C=1mA
Temperature coefficient of ΔV_{BE}		SL3145		2.0		μV/°C	
Temperature coefficient of V_{BE}		SL3145		1.6		mV/°C	
Static forward current ratio	H_{fe}	SL3127	35	95			V_{CE}=6V, I_C=5mA
		SL3127	35	100			V_{CE}=6V, I_C=.1mA
		SL3145/27	40	100			V_{CE}=6V, I_C=1mA
Collector base leakage	I_{CBO}	SL3127/45		0.3		nA	V_{CB}=16V
Collector isolation leakage	I_{CIO}	SL3127/45		0.6		nA	V_{CI}=20V
Base isolation leakage	I_{IBO}	SL3145		100		nA	V_{BI}=5V
Emitter base capacitance	C_{EB}	SL3145		0.4		pF	V_{EB}=0V
Collector base capacitance	C_{CB}	SL3145		0.4		pF	V_{CB}=0V
Collector isolation capacitance	C_{CI}	SL3145		0.8		pF	V_{CI}=0V
Dynamic characteristics							
Transition frequency	f_T	SL3127/45		1.6		GHz	V_{CE}=6V, I_C=5mA
Wideband noise figure	NF	SL3127		3.6		dB	V_{CE}=6V, R_S=200Ω I_C=2mA, f=60MHz
		SL3145		3.0		dB	V_{CE}=2V, R_S=1kΩ I_C=100μA
Knee of 1/f noise curve		SL3127/45		1		kHz	V_{CE}=6V, R_S=200Ω I_C=2mA

ABSOLUTE MAXIMUM RATINGS

The absolute maximum ratings are limiting values above which operating life maybe 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} = 5.0 volt
V_{CE} = 15 volt
V_{CI} = 20 volt
Ic = 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	DP16	DP14	DG16	DG14
Chip to case			40	40
Chip to Ambient	175	180	120	125

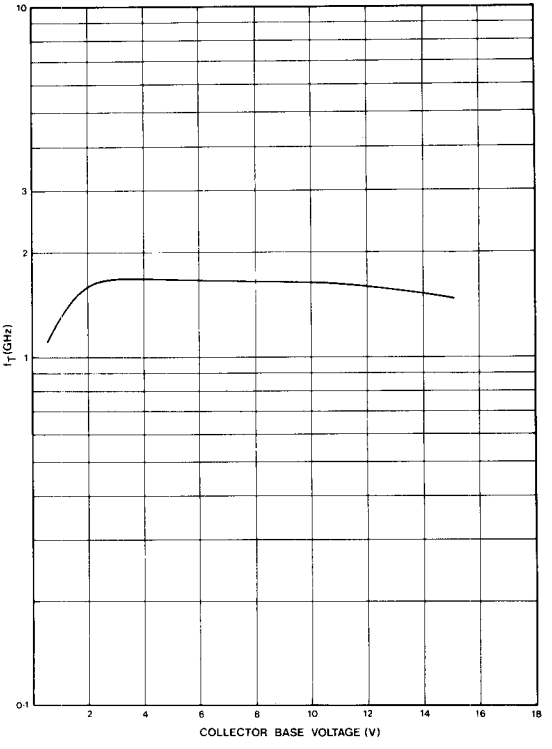

Fig. 4 Transition frequency (f_T) v. collector base voltage
(I_C = 5mA, Frequency = 200MHz)

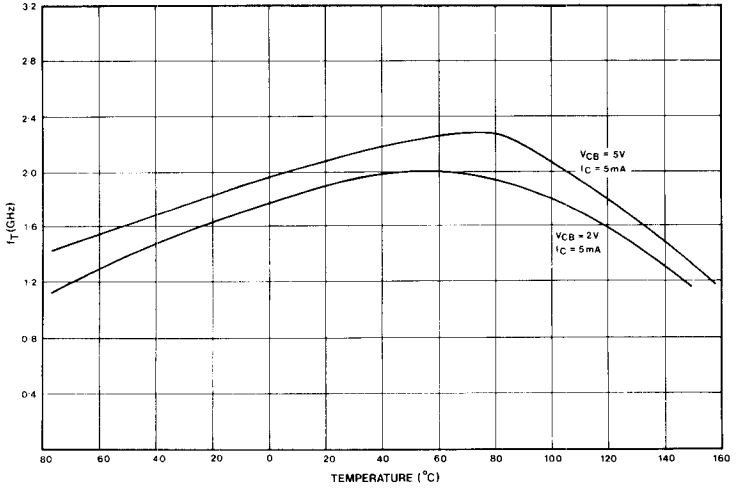

Fig. 5 Variation of transition frequency (f_T) with temperature

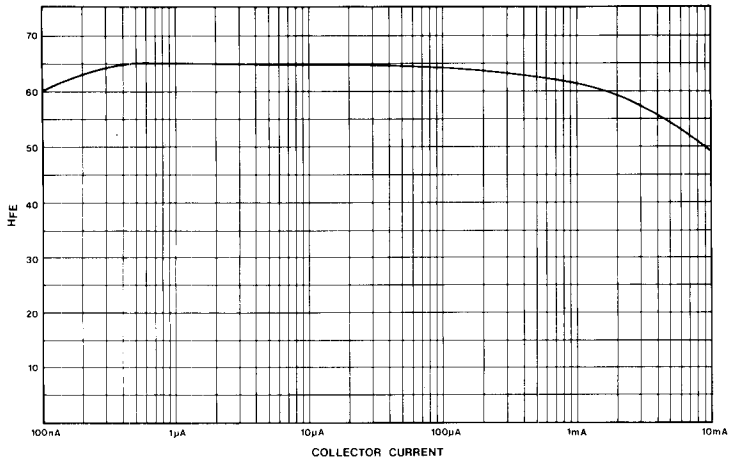

Fig. 6 DC current gain v. collector current

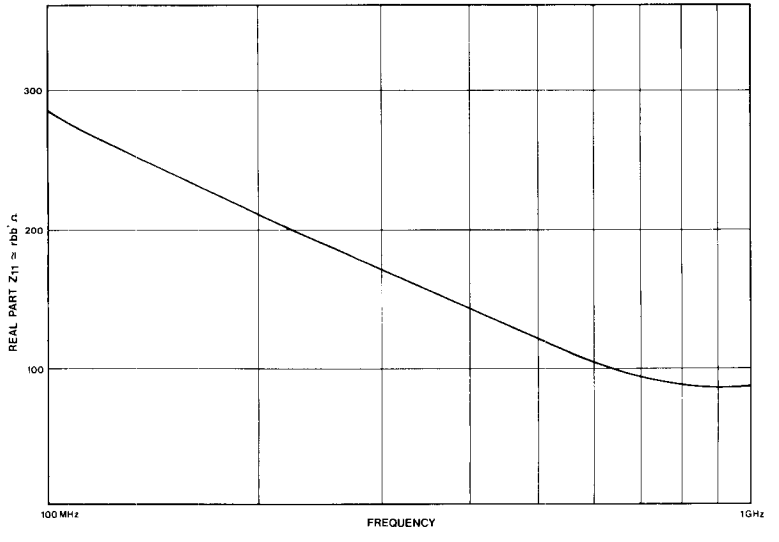

Fig. 7 Z_{11} (derived from scattering parameters) v. frequency ($Z_{11} \triangleq r_{66'}$)