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SL3145

1.6GHz NPN TRANSISTOR ARRAYS

The SL3145 is a monolithic array of five high frequency low current NPN transistors. The SL3145 consists of 3 isolated transistors and a differential pair in a 14 lead SO package The transistors exhibit typical $f\tau s$ of 1.6GHz and wideband noise figures of 3.0dB The device is pin compatible with the CA3046.

FEATURES

- f_⊤ Typically 1.6GHz
- Wideband Noise Figure 3.0dB
- V_{BE} Matching Better Than 5mV

Fig.1 Pin connections SL3145

APPLICATIONS

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

ORDERING INFORMATION

SL3145 C MP

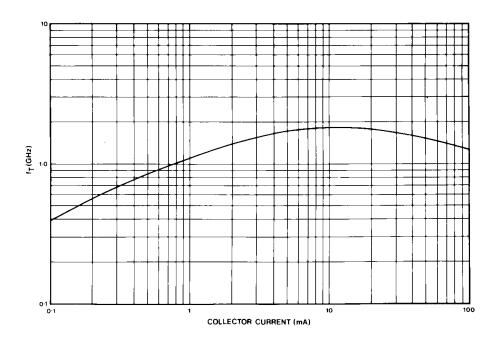


Fig.2 Transition frequency (f_T) v. collector current (V_{CB} = 2V, f=200MHz)

ELECTRICAL CHARACTERISTICS

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

 $T_{amb} = 22^{\circ}C \pm 2^{\circ}C$

| Characteristic | Symbol | Value | | | Units | Conditions |
|---|--------------------------|-------|------|------|------------|------------------------------------|
| | | Min. | Тур. | Max. | Oo | Conditions |
| Static characteristic | | | | | | |
| Collector base breakdown | ВУсво | 20 | 30 | | V | $Ic = 10\mu A, IE = 0$ |
| Collector emitter breakdown | LVceo | 15 | 18 | | V | Ic = 1mA, IB = 0 |
| Collector substrate breakdown (isolation) | BVcio | 20 | 55 | | V | $Ic = 10\mu A$, $IR = IE = 0$ |
| Base to isolation breakdown | ВУвю | 10 | 20 | | V | $I_B = 10 \mu A$, $I_C = I_E = 0$ |
| Base emitter voltage | VBE | 0.64 | 0.74 | 0.84 | V | Vce = 6V, $Ic = 1mA$ |
| Collector emitter saturation voltage | Vce(SAT) | | 0.26 | 0.5 | V | Ic = 10mA, $IB = 1mA$ |
| Emitter base leakage current | ІЕВО | | 0.1 | 1 | μΑ | $V_{EB} = 4V$ |
| Base emitter saturation voltage | VBE(SAT) | | 0.95 | | V | Ic = 10mA, $IB = 1mA$ |
| Base emitter voltage difference, | ΔV be | | 0.45 | 5 | mV | $V_{CE} = 6V$, $I_{C} = 1mA$ |
| all transistors expect TR1, TR2 | | | | | | |
| Base emitter voltage difference | ΔV_BE | | 0.35 | 5 | mV | Vce = 6V, Ic = 1mA |
| TR1, TR2 | | | | | | |
| Input offset current | ΔI_B | | 0.2 | 3 | μА | Vce = 6V, Ic = 1mA |
| (except for TR1, TR2) | | | | | ' | |
| Input offset current TR1, TR2 | ΔI_B | | 0.2 | 2 | μΑ | $V_{CE} = 6V$, $I_{C} = 1mA$ |
| Temperature coefficient of ΔV _{BE} | $\partial \Delta V_{BE}$ | | 2.0 | | μV/°C | |
| · | T6 | | | | l ' | |
| Temperature coefficiient of VBE | ∂ <u>V</u> <u>be</u> | | -1.6 | | mV/°C | $V_{CE} = 6V$, $I_{C} = 1mA$ |
| • | 7E | | | | | , |
| Static forward current ratio | HFE | 40 | 100 | | | $V_{CE} = 6V$, $I_{C} = 1mA$ |
| Collector base leakage | Ісво | | 0.3 | | nA | VcB = 16V |
| Collector isolation leakage | Icio | | 0.6 | | nA | Vci = 20V |
| Base isolation leakage | Івіо | | 100 | | nA | Vы = 5V |
| Emitter base capacitance | Сев | | 0.4 | | pF | $V_{EB} = 0V$ |
| Collector base capacitance | | | | | | |
| SL3145 | Ссв | | 0.4 | | pF | Vcb = 0V |
| Collector isolation capacitance | Ссі | | 0.8 | | pF | Vcı = 0V |
| Dynamic characteristics | | | | | | |
| Transition frequency | | | | | | |
| SL3145 | f⊤ | | 1.6 | | GHz | $V_{CE} = 6V$, $I_{C} = 5mA$ |
| Wideband noise figure | NF | | 3.0 | | dB | $V_{CE} = 2V$, $R_S = 1k\Omega$ |
| J | | | | | - | Ic = 100μA, f = 60MHz |
| Knee of 1/f noise curve | | | 1 | | KHz | $V_{CE} = 6V$, $R_S = 200\Omega$ |
| | | | | | ' | Ic = 2mA |
| | | | | | | |

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.

 $V_{CB} = 20 \text{ volt}$

 $V_{EB} = 4.0 \text{ volt}$

 $V_{CE} = 15 \text{ volt}$

Vci = 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 MP14
Chip to case 45°C/W
Chip to ambient 123°C/W

NOTE:

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

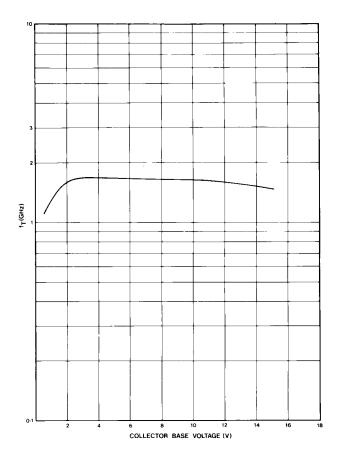


Fig.3 Transition frequency (f τ) v. collector base voltage (Ic = 5mA, Frequency = 200MHz)

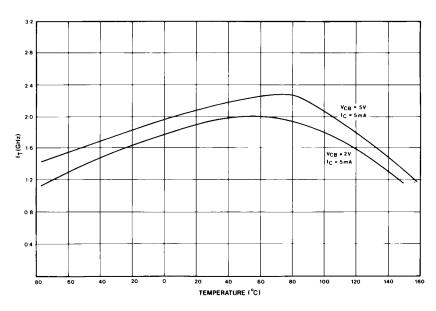


Fig.4 Variation of transition frequency (f_T) with temperature

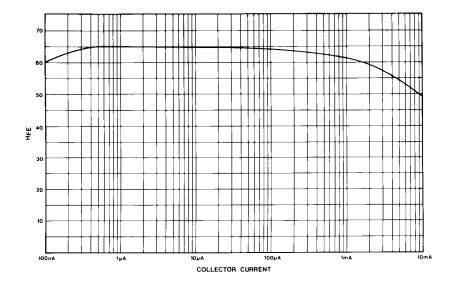


Fig.5 DC current gain v. collector current

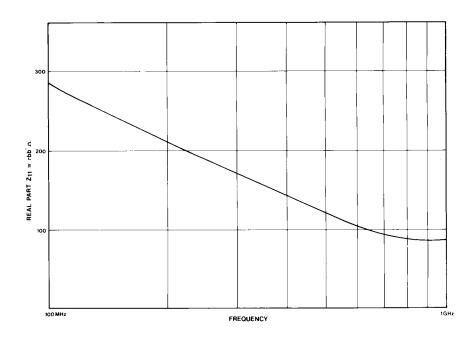


Fig.6 Z₁₁ (derived from scattering parameters) v. frequency (Z₁₁ __<rb)



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