

TRANSISTOR (NPN)

FEATURES

Darlington Amplifier

Marking : MMBTA13:K2D; MMBTA14:K3D

MAXIMUM RATINGS (T_A=25°C unless otherwise noted)

Symbol	Parameter	Value	Units
V _{CB0}	Collector-Base Voltage	30	V
V _{CEO}	Collector-Emitter Voltage	30	V
V _{EBO}	Emitter-Base Voltage	10	V
I _C	Collector Current -Continuous	0.3	A
P _C	Collector Power Dissipation	300	mW
R _{θJA}	Thermal Resistance Junction to Ambient	417	°C/W
T _J	Junction Temperature	150	°C
T _{stg}	Storage Temperature	-55 to +150	°C

SOT-23



1. BASE
2. EMITTER
3. COLLECTOR

ELECTRICAL CHARACTERISTICS (T_{amb}=25°C unless otherwise specified)

Parameter	Symbol	Test conditions	MIN	MAX	UNIT
Collector-base breakdown voltage	V _{(BR)CBO}	I _C = 100μA, I _E =0	30		V
Collector-emitter breakdown voltage	V _{(BR)CEO}	I _C = 100uA, I _B =0	30		V
Collector-emitter breakdown voltage	V _{(BR)EBO}	I _E = 100μA, I _C =0	10		V
Collector cut-off current	I _{CBO} *	V _{CB} =30 V, I _E =0		0.1	μA
Emitter cut-off current	I _{EBO} *	V _{EB} = 10V, I _C =0		0.1	μA
DC current gain	h _{FE(1)} *	V _{CE} =5V, I _C = 10mA	MMBTA13 5000		
	h _{FE(2)} *	V _{CE} =5V, I _C = 100mA	MMBTA13 10000 MMBTA14 20000		
Collector-emitter saturation voltage	V _{CE(sat)} *	I _C =100mA, I _B =0.1mA		1.5	V
Base-emitter saturation voltage	V _{BE(sat)} *	I _C =100mA, I _B =0.1mA		2	V
Base-emitter voltage	V _{BE} *	V _{CE} =5V, I _C = 100mA		2.0	V
Transition frequency	f _T	V _{CE} =5V, I _C = 10mA f=100MHz	125		MHz
Collector output capacitance	C _{ob}	V _{CB} =10V, I _E =0, f=1MHz		12	pF

* Pulse Test : pulse width≤300μs, duty cycles≤2%.

Typical Characteristics

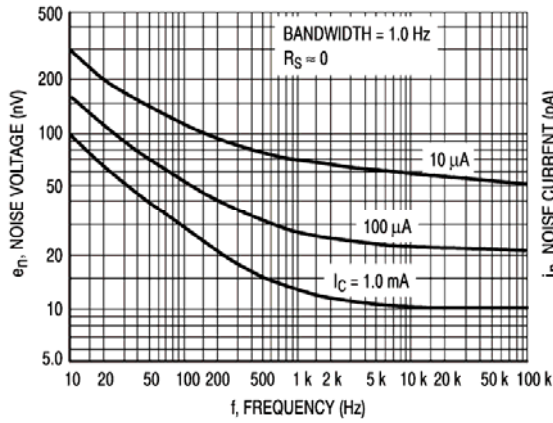


Figure 2. Noise Voltage

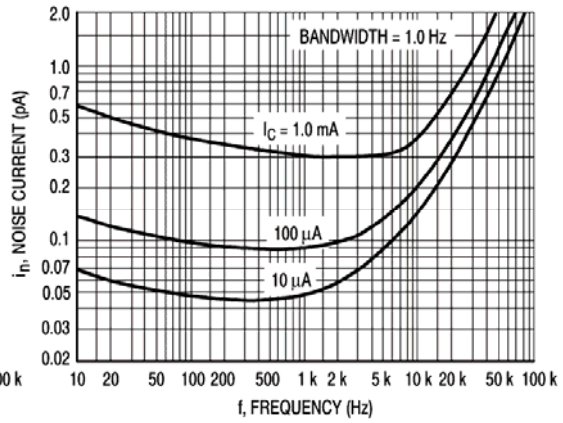


Figure 3. Noise Current

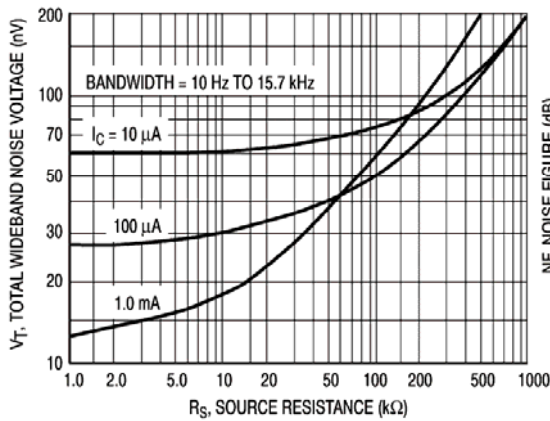


Figure 4. Total Wideband Noise Voltage

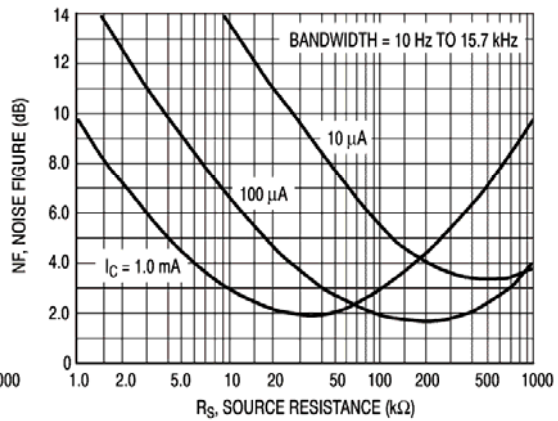


Figure 5. Wideband Noise Figure

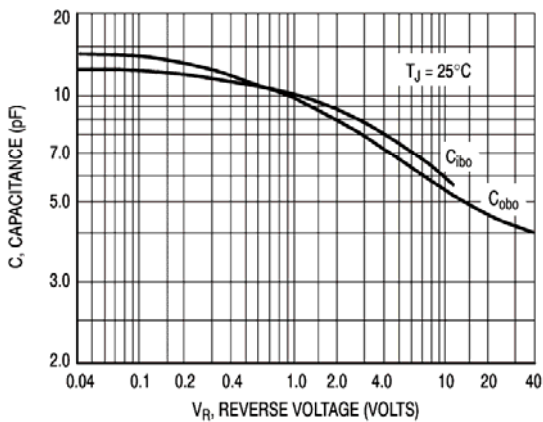


Figure 6. Capacitance

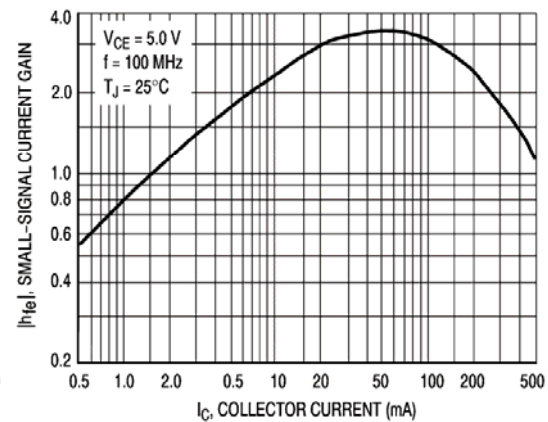


Figure 7. High Frequency Current Gain

Typical Characteristics

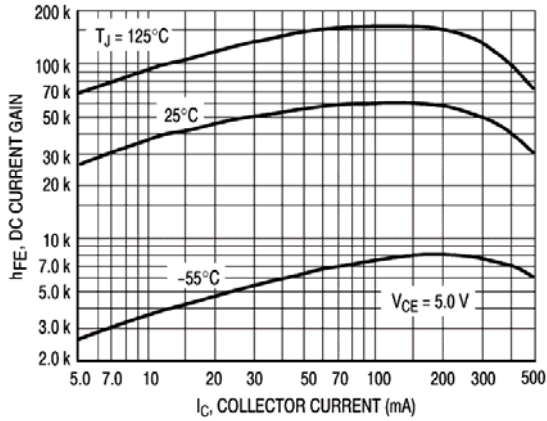


Figure 8. DC Current Gain

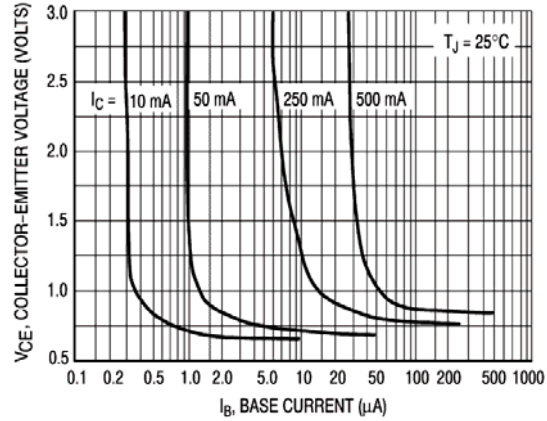


Figure 9. Collector Saturation Region

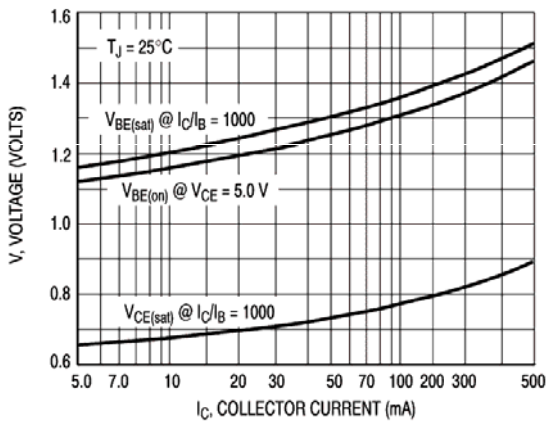


Figure 10. "On" Voltages

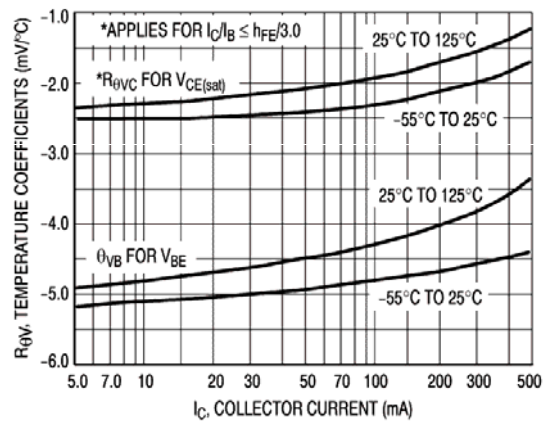


Figure 11. Temperature Coefficients

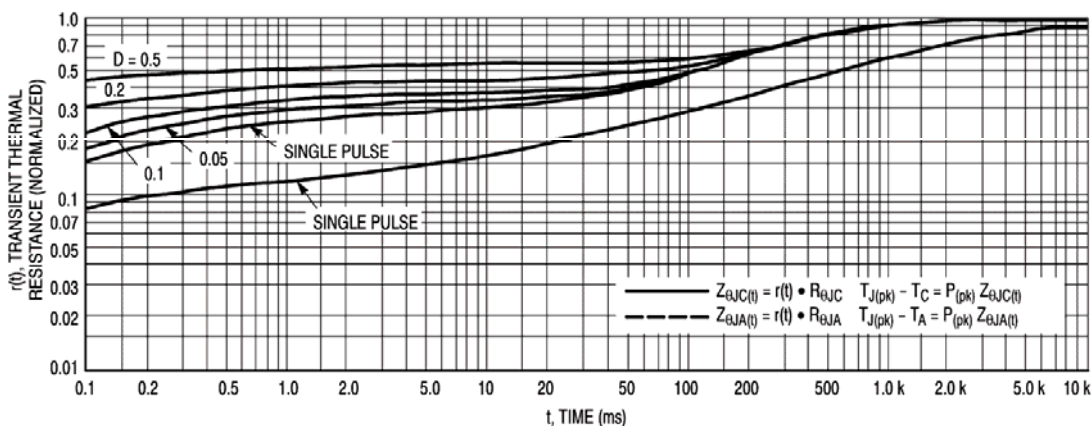


Figure 12. Thermal Response