

Plastic-Encapsulate Transistors NPN Darlington Transistor

 Lead(Pb)-Free

1. EMITTER
2. BASE
3. COLLECTOR



TO-92

Maximum Ratings($T_A=25^{\circ}\text{C}$ Unless Otherwise Specified)

Rating	Symbol	Value	Unit
Collector-Emitter Voltage	V_{CEO}	30	V
Collector-base Voltage	V_{CBO}	30	V
Emitter-base Voltage	V_{EBO}	10	V
Collector Current	I_C	500	mA
Total Power Dissipation($T_A=25^{\circ}\text{C}$)	P_D	0.625	W
Operating Junction and Storage Temperature Range	T_J, T_{stg}	- 55~+150	$^{\circ}\text{C}$

Electrical Characteristics($T_A=25^{\circ}\text{C}$ Unless otherwise noted)

Characteristic		Symbol	Min	Max	Unit
Collector-base breakdown voltage $I_C=100\mu\text{A}, I_E=0$		$V_{(BR)CB0}$	30	-	V
Collector-emitter breakdown voltage $I_C=1\text{mA}, I_B=0$		$V_{(BR)CE0}$	30	-	V
Emitter-base breakdown voltage $I_E=100\mu\text{A}, I_C=0$		$V_{(BR)EB0}$	10	-	V
Collector cut-off current $V_{CB}=30\text{V}, I_E=0$		I_{CB0}		0.1	μA
Emitter cut-off current $V_{EB}=10\text{V}, I_C=0$		I_{EBO}		0.1	μA
DC current gain ¹ $V_{CE}=5\text{V}, I_C=10\text{mA}$ $V_{CE}=5\text{V}, I_C=100\text{mA}$	MPSA13 MPSA14	$H_{FE(1)}$	5000 10000	-	-
	MPSA13 MPSA14	$H_{FE(2)}$	10000 20000	-	-
Collector-emitter saturation voltage ¹ $I_C=100\text{mA}, I_B=0.1\text{mA}$		$V_{CE(sat)}$		1.5	V
Base-emitter voltage ¹ $V_{CE}=5\text{V}, I_C=10\text{mA}$		$V_{BE(on)}$		2.0	V
Transition frequency $V_{CE}=5\text{V}, I_C=10\text{mA}, F=100\text{MHz}$		f_T	125	-	MHz

Note: 1.Pulse Test: Pulse width $\leq 300\mu\text{s}$, duty cycle $\leq 2\%$.

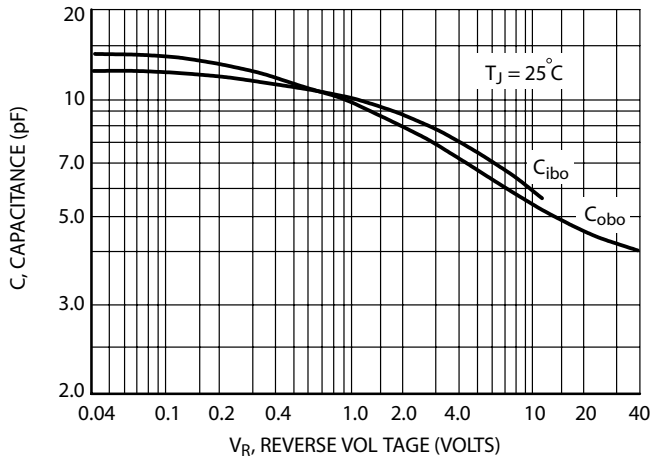


Figure 1. Capacitance

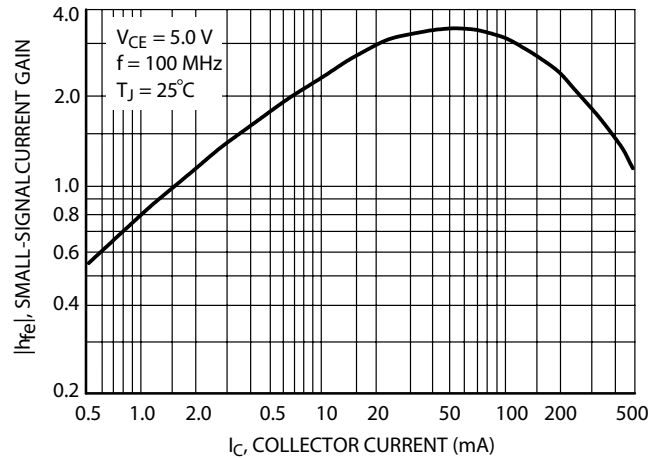


Figure 2. High Frequency Current Gain

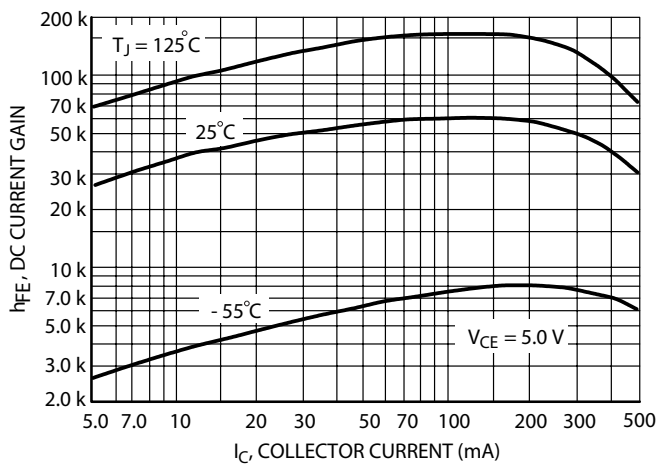


Figure 3. DC Current Gain

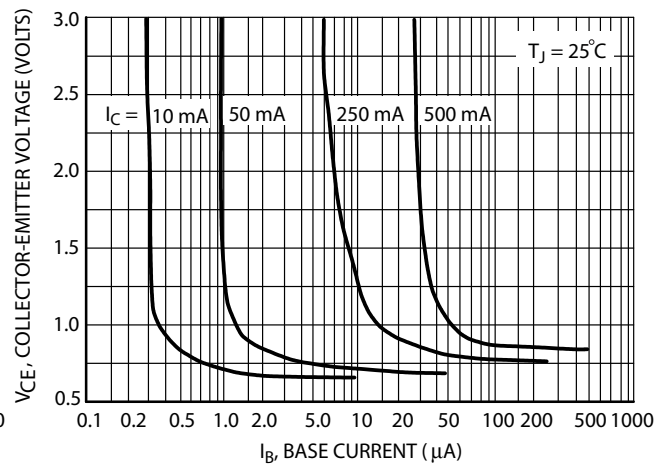


Figure 4. Collector Saturation Region

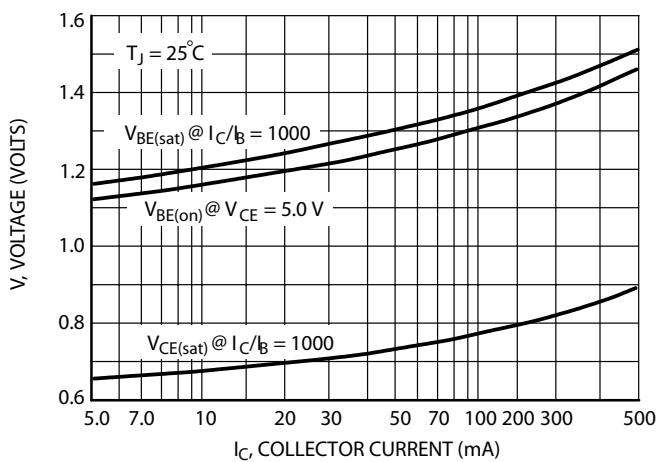


Figure 5. "On" Voltages

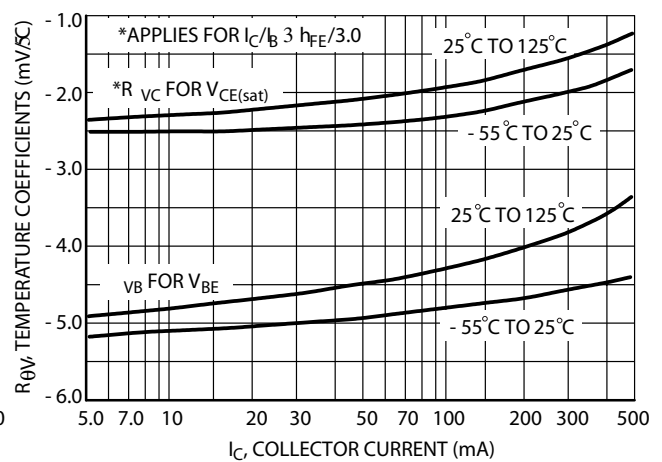


Figure 6. Temperature Coefficients

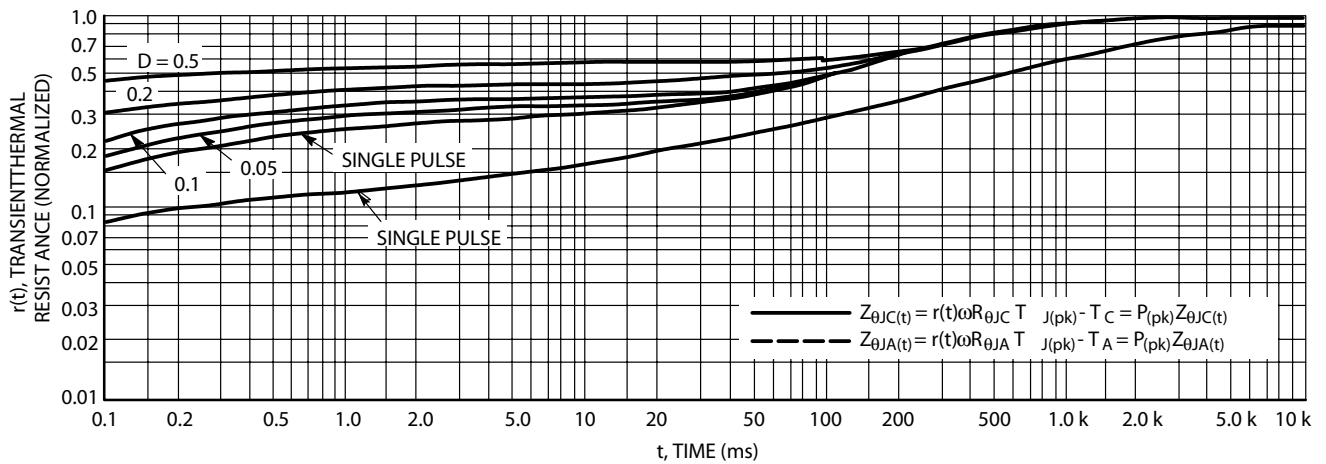


Figure 7. Thermal Response

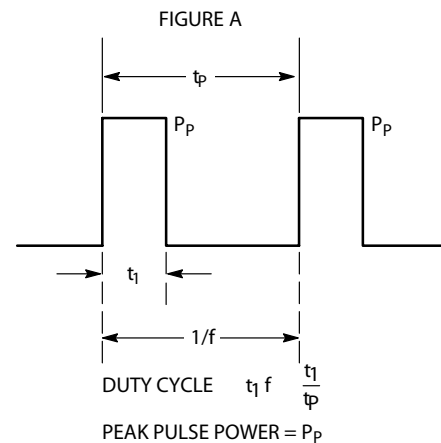
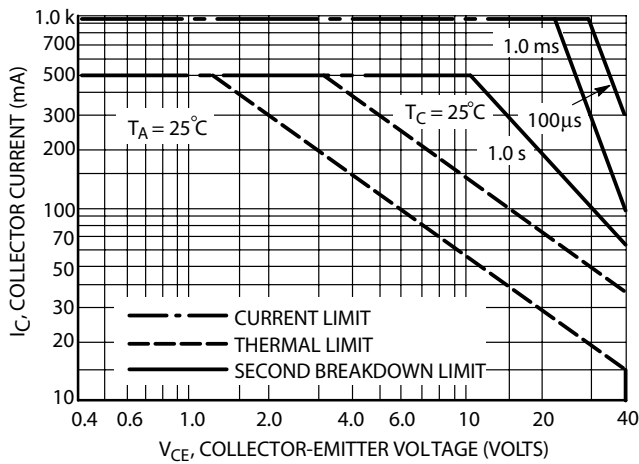
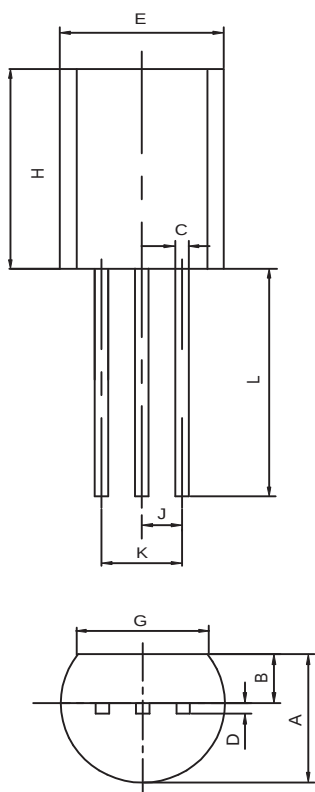


Figure 8. Active Region Safe Operating Area Design Note: Use of Transient Thermal Resistance Data

TO-92 Outline Dimensions

unit:mm



TO-92		
Dim	Min	Max
A	3.30	3.70
B	1.10	1.40
C	0.38	0.55
D	0.36	0.51
E	4.40	4.70
G	3.43	-
H	4.30	4.70
J	1.270TYP	
K	2.44	2.64
L	14.10	14.50