

Silicon NPN Darlington Power Transistor

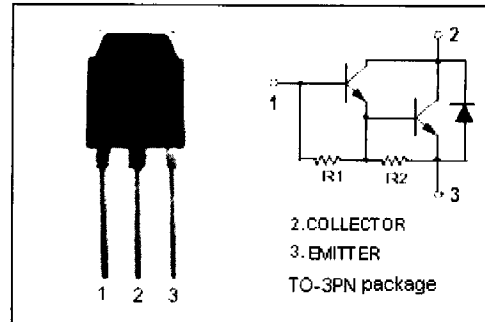
TIP142

DESCRIPTION

- High DC Current Gain-
 : $h_{FE} = 1000(\text{Min}) @ I_C = 5A$
- Collector-Emitter Sustaining Voltage-
 : $V_{CEO(\text{SUS})} = 100V(\text{Min})$
- Complement to Type TIP147

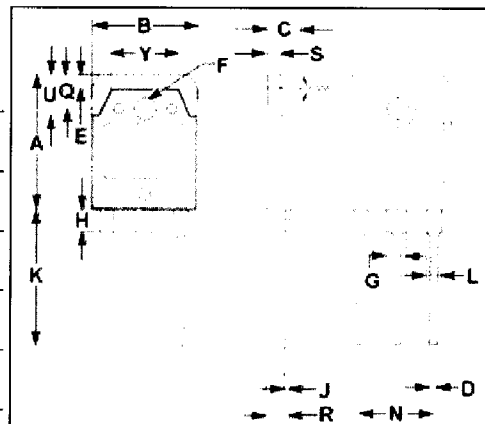
APPLICATIONS

- Designed for general purpose amplifier and low frequency switching applications.



ABSOLUTE MAXIMUM RATINGS ($T_a = 25^\circ\text{C}$)

SYMBOL	PARAMETER	VALUE	UNIT
V_{CBO}	Collector-Base Voltage	100	V
V_{CEO}	Collector-Emitter Voltage	100	V
V_{EBO}	Emitter-Base Voltage	5	V
I_C	Collector Current-Continuous	10	A
I_{CM}	Collector Current-Peak	15	A
I_B	Base Current- Continuous	0.5	A
P_C	Collector Power Dissipation @ $T_c = 25^\circ\text{C}$	125	W
T_j	Junction Temperature	150	$^\circ\text{C}$
T_{stg}	Storage Temperature Range	-65~150	$^\circ\text{C}$



DIM	mm	
	MIN	MAX
A	19.90	20.10
B	15.50	15.70
C	4.70	4.90
D	0.90	1.10
E	1.90	2.10
F	3.40	3.60
G	2.90	3.10
H	3.20	3.40
J	0.595	0.605
K	20.50	20.70
L	1.90	2.10
N	10.89	10.91
Q	4.90	5.10
R	3.35	3.45
S	1.995	2.005
U	5.90	6.10
Y	9.90	10.10

THERMAL CHARACTERISTICS

SYMBOL	PARAMETER	MAX	UNIT
$R_{th\ j-c}$	Thermal Resistance, Junction to Case	1.0	$^\circ\text{C/W}$
$R_{th\ j-a}$	Thermal Resistance, Junction to Ambient	35.7	$^\circ\text{C/W}$



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ELECTRICAL CHARACTERISTICS

$T_C=25^\circ\text{C}$ unless otherwise specified

SYMBOL	PARAMETER	CONDITIONS	MIN	TYP.	MAX	UNIT
$V_{CEO(SUS)}$	Collector-Emitter Sustaining Voltage	$I_C = 30\text{mA}, I_B = 0$	100			V
$V_{CE(sat)-1}$	Collector-Emitter Saturation Voltage	$I_C = 5\text{A}, I_B = 10\text{mA}$			2.0	V
$V_{CE(sat)-2}$	Collector-Emitter Saturation Voltage	$I_C = 10\text{A}, I_B = 40\text{mA}$			3.0	V
$V_{BE(sat)}$	Base-Emitter Saturation Voltage	$I_C = 10\text{A}, I_B = 40\text{mA}$			3.5	V
$V_{BE(on)}$	Base-Emitter On Voltage	$I_C = 10\text{A}; V_{CE} = 4\text{V}$			3.0	V
I_{CBO}	Collector Cutoff current	$V_{CB} = 100\text{V}, I_E = 0$			1	mA
I_{CEO}	Collector Cutoff current	$V_{CE} = 50\text{V}, I_B = 0$			2	mA
I_{EBO}	Emitter Cutoff Current	$V_{EB} = 5\text{V}; I_C = 0$			2	mA
h_{FE-1}	DC Current Gain	$I_C = 5\text{A}; V_{CE} = 4\text{V}$	1000			
h_{FE-2}	DC Current Gain	$I_C = 10\text{A}; V_{CE} = 4\text{V}$	500			

Switching Times

Symbol	Parameter	Conditions	MIN	TYP.	MAX	UNIT	
t_d	Delay Time	$V_{CC} = 30\text{V}, I_C = 5.0\text{A},$ $I_B = 20\text{mA};$ Duty Cycle $\leq 20\%$ $I_{B1} = I_{B2},$ $R_C \text{ \& } R_B \text{ Varied},$ $T_J = 25^\circ\text{C}$		0.15		μs	
t_r	Rise Time			0.55		μs	
t_{stg}	Storage Time				2.5		μs
t_f	Fall Time				2.5		μs