

**Silicon NPN Darlington Power Transistor**

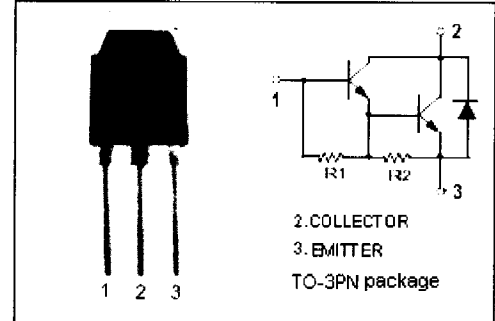
**TIP160**

**DESCRIPTION**

- Collector-Emitter Sustaining Voltage-  
 :  $V_{CE(SUS)} = 320V(\text{Min})$
- Low Collector-Emitter Saturation Voltage-  
 :  $V_{CE(sat)} = 2.9V(\text{Max.}) @ I_C = 10A$

**APPLICATIONS**

- Designed for use in automotive ignition, switching and motor control applications.

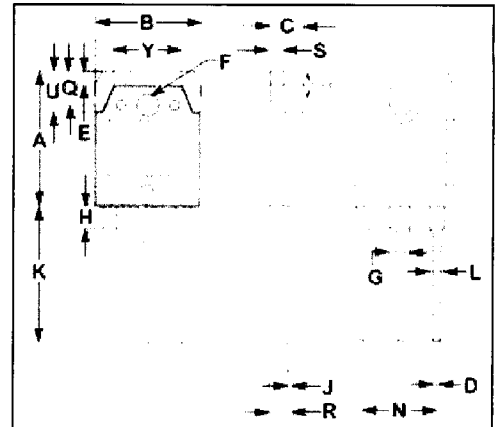


**ABSOLUTE MAXIMUM RATINGS ( $T_a = 25^\circ\text{C}$ )**

SYMBOL	PARAMETER	VALUE	UNIT
$V_{CBO}$	Collector-Base Voltage	320	V
$V_{CEO}$	Collector-Emitter Voltage	320	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	1.0	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	$^\circ\text{C}$

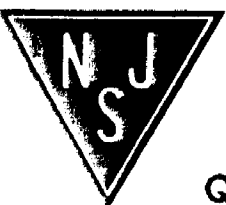
**THERMAL CHARACTERISTICS**

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



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

NJ Semi-Conductors reserves the right to change test conditions, parameter limits and package dimensions without notice. Information furnished by NJ Semi-Conductors is believed to be both accurate and reliable at the time of going to press. However, NJ Semi-Conductors assumes no responsibility for any errors or omissions discovered in its use. NJ Semi-Conductors encourages customers to verify that datasheets are current before placing orders.



# Silicon NPN Darlington Power Transistor

# TIP160

## ELECTRICAL CHARACTERISTICS

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

SYMBOL	PARAMETER	CONDITIONS	MIN	TYP.	MAX	UNIT
$V_{CE(sat)-1}$	Collector-Emitter Saturation Voltage	$I_C = 6.5\text{A}, I_B = 0.1\text{A}$			2.8	V
$V_{CE(sat)-2}$	Collector-Emitter Saturation Voltage	$I_C = 10\text{A}, I_B = 1\text{A}$			2.9	V
$V_{BE(sat)}$	Base-Emitter Saturation Voltage	$I_C = 6.5\text{A}, I_B = 0.1\text{A}$			2.2	V
$I_{CEO}$	Collector Cutoff current	$V_{CE} = 320\text{V}, I_B = 0$			1.0	mA
$I_{EBO}$	Emitter Cutoff Current	$V_{EB} = 5\text{V}; I_C = 0$			100	mA
$h_{FE}$	DC Current Gain	$I_C = 4\text{A}; V_{CE} = 2.2\text{V}$	200			
$V_F$	C-E Diode Forward Voltage	$I_F = 10\text{A}$			3.5	V

### Switching Times

$t_d$	Delay Time	$V_{CC} = 33\text{V}, I_C = 6.5\text{A},$ $I_{B1} = -I_{B2} = 100\text{mA};$ $t_p = 20\ \mu\text{s}; \text{Duty Cycle} \leq 2\%$		0.3		$\mu\text{s}$
$t_r$	Rise Time			1.5		$\mu\text{s}$
$t_{stg}$	Storage Time			2.3		$\mu\text{s}$
$t_f$	Fall Time			2.8		$\mu\text{s}$