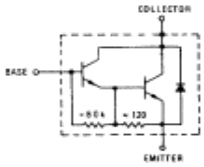
NPN DARLINGTON POWER TRANSISTOR

2N6386
2N6387
2N6388

TO-220



TO-220
Plastic Package
RoHS compliant

FEATURES

1. NPN Darlington transistors from 8 to 10 Amp,40 to 80 Volts, 65Watts.
2. Collector-Emitter Sustaining Voltage
   $V_{CEO(SUS)}$ = 40V(Min.) 2N6386
   $V_{CEO(SUS)}$ = 60V(Min.) 2N6387
   $V_{CEO(SUS)}$ = 80V(Min.) 2N6388
3. Collector-Emitter Saturation Voltage
   $V_{CE(SAT)}$ = 2.0(Max.) @I_C =3.0A 2N6386
   $V_{CE(SAT)}$ = 2.0(Max.) @I_C =5.0A 2N6387,2N6388
4. DC gain h_{FE} =2000 (Typ.) @I_C = 4.0 A
5. Complementry to 2N6666, 2N6667,2N66668

APPLICATIONS:

General purpose amplifier and low speed switching.

ABSOLUTE MAXIMUM RATINGS (T_a = 25 °C)

Parameter	Symbol	2N6386	2N6387	2N6388	Unit
Collector-Base Voltage	V_{CBO}	40	60	80	V
Collector-Emitter Voltage	V_{CEO}	40	60	80	V
Emitter-Base Voltage	V_{EBO}	5.0			V
Collector Current-continouse	I_C	8.00	10	10	A
Collector Current-Peak	I_{CM}	15.00			
Base Current	I_B	0.25			A
Total Power Dissipation @TC= 25 ℃	P_D	65.0			W
Total Power Dissipation Derate above @TC= 25 ℃		0.52			W
Storage Temperature	T_J, T_{stg}	-65 to +150			°C

THERMAL CHARACTERISTICS

Parameter	Symbol	Value (Max.)	Unit
Thermal Resistance Junction to Case	$R_{\theta jc}$	1.92	°C/W

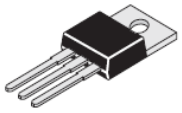
ELECTRICAL CHARACTERISTICS at T_a = 25 °C unless otherwise specified

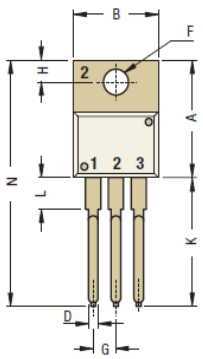
Parameter	Symbol	Test Conditions	Value			Unit
			Min.	Typ.	Max.	
OFF CHARACTERISTICS						
Collector Cut-off Current						
2N6386	I_{CEO}	VCE= 40V, IB=0	--	--	1	mA
2N6387		VCE= 60V, IB=0	--	--	1	
2N6388		VCE= 80V, IB=0	--	--	1	
2N6386	I_{CEX}	V_{CE}= 40V,$V_{BE(OFF)}$=1.5V	--	--	0.3	mA
2N6387		V_{CE}= 60V,$V_{BE(OFF)}$=1.5V	--	--	0.3	
2N6388		V_{CE}= 80V,$V_{BE(OFF)}$=1.5V	--	--	0.3	
2N6386	I_{CEX} @125℃	V_{CE}= 40V,$V_{BE(OFF)}$=1.5V	--	--	3	
2N6387		V_{CE}= 60V,$V_{BE(OFF)}$=1.5V	--	--	3	
2N6388		V_{CE}= 80V,$V_{BE(OFF)}$=1.5V	--	--	3	
Emitter Cut-off Current	I_{EBO}	V_{EB}= -5V, I_C=0	--	--	5	mA
Collector-Emitter Sustaining Voltage(1)						
2N6386	$V_{CEO(SUS)}$	IC= 200mA, IB=0	40	--	--	V
2N6387			60	--	--	
2N6388			80	--	--	
ON CHARACTERISTICS						
DC Current Gain						
2N6386	h_{FE}	V_{CE}= 3V, I_C= 3.0A	1000	--	20000	
2N6387.2N6388		V_{CE}= 3V, I_C= 5.0A	1000	--	20000	
2N6386		V_{CE}= 3V, I_C= 8.0A	100	--	--	
2N6387.2N6388		V_{CE}= 3V, I_C= 10.0A	100	--	--	
Collector-Emitter Saturation Voltage						
2N6386	$V_{CE(sat)}$	I_C= 3A,I_B= 6mA	--	--	2.0	V
2N6387.2N6388		I_C= 5A,I_B= 10mA	--	--	2.0	
2N6386		I_C= 8A,I_B= 80mA	--	--	3.0	
2N6387.2N6388		I_C= 10A,I_B= 100mA	--	--	3.0	
Base-Emitter on Voltage						
2N6386	$V_{BE(on)}$	V_{CE}= 3V,I_C=3A	--	--	2.8	V
2N6387.2N6388		V_{CE}= 3V,I_C=5A	--	--	2.8	
2N6386		V_{CE}= 3V,I_C=8A	--	--	4.5	
2N6387.2N6388		V_{CE}= 3V,I_C=10A	--	--	4.5	
DYNAMIC CHARACTERISTICS						
Small Signal Current Gain	h_{fe}	V_{CE}= 5V, I_C=1.0A, f = 1.0KHz	1000	--	--	
Output Capacitance	C_{ob}	V_{CB}= 10V,I_E=0,f=1.0MHz	--	--	200	pF

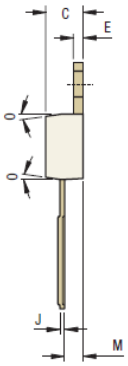
(1) Pulse Test : Pulse width =300μS, Duty Cycle ≤2.0%

Package Details

TO-220
Leaded Plastic Package







DIM	Min	Max
A	14.42	16.51
B	9.63	10.67
C	3.56	4.83
D	—	0.90
E	1.15	1.50
F	3.53	4.10
G	2.29	2.79

DIM	Min	Max
H	2.54	3.43
J	0.36	0.61
K	12.00	14.73
L	2.80	6.35
M	2.00	2.92
N	—	31.24
O	7°	

Pin Configurations

Transistors	Pin 1: Base	Pin 2: Collector	Pin 3: Emitter
SCRs	Pin 1: Cathode	Pin 2: Anode	Pin 3: Gate
Triacs	Pin 1: T1	Pin 2: T2	Pin 3: Gate
Regulators	Pin 1: In	Pin 2: Ground	Pin 3: Out

All dimensions are in mm

Recommended Product Storage Environment for Diode and Transistors

This storage environment assumes that the Diodes and transistors are packed properly inside the original packing supplied by CDIL.

- Temperature **5 °C to 30 °C**
- Humidity between **40 to 70 %RH**
- Air should be clean.
- Avoid harmful gas or dust.
- Avoid outdoor exposure or storage in areas subject to rain or water spraying .
- Avoid storage in areas subject to corrosive gas or dust. Product shall not be stored in areas exposed to direct sunlight.
- Avoid rapid change of temperature.
- Avoid condensation.
- Mechanical stress such as vibration and impact shall be avoided.
- The product shall not be placed directly on the floor.
- The product shall be stored on a plane area. They should not be turned upside down. They should not be placed against the wall.

Shelf Life of CDIL Products

The shelf life of products is the period from product manufacture to shipment to customers. The product can be unconditionally shipped within this period. The period is defined as 2 years.

If products are stored longer than the shelf life of 2 years, the products shall be subjected to quality check as per CDIL quality procedure.

The products are further warranted for another one year after the date of shipment subject to the above conditions in CDIL original packing.

Floor Life of CDIL Products and MSL Level

When the products are opened from the original packing, the floor life will start. For this the following JEDEC table may be referred:

JEDEC MSL Level		
Level	Time	Condition
1	Unlimited	≤ 30 °C / 85% RH
2	1 Year	≤ 30 °C / 60% RH
2a	4 Weeks	≤ 30 °C / 60% RH
3	168 Hours	≤ 30 °C / 60% RH
4	72 Hours	≤ 30 °C / 60% RH
5	48 Hours	≤ 30 °C / 60% RH
5a	24 Hours	≤ 30 °C / 60% RH
6	Time on Label(TOL)	≤ 30 °C / 60% RH

Figure 1 Floor Life according to JEDEC MSL Level

Customer Notes

Component Disposal Instructions

1. CDIL Semiconductor Devices are RoHS compliant, customers are requested to please dispose as per prevailing Environmental Legislation of their Country.
2. In Europe, please dispose as per EU Directive 2002/96/EC on Waste Electrical and Electronic Equipment (WEEE).

Disclaimer

The product information and the selection guides facilitate selection of the CDIL's Semiconductor Device(s) best suited for application in your product(s) as per your requirement. It is recommended that you completely review our Data Sheet(s) so as to confirm that the Device(s) meet functionality parameters for your application. The information furnished in the Data Sheet and on the CDIL Web Site/CD are believed to be accurate and reliable. CDIL however, does not assume responsibility for inaccuracies or incomplete information. Furthermore, CDIL does not assume liability whatsoever, arising out of the application or use of any CDIL product; neither does it convey any license under its patent rights nor rights of others. These products are not designed for use in life saving/support appliances or systems. CDIL customers selling these products (either as individual Semiconductor Devices or incorporated in their end products), in any life saving/support appliances or systems or applications do so at their own risk and CDIL will not be responsible for any damages resulting from such sale(s).

CDIL strives for continuous improvement and reserves the right to change the specifications of its products without prior notice.

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