:

Continental Device India Pvt. Limited

An IATF 16949, ISO9001 and ISO 14001 Certified Company

DARLIGTON COMPLIMENTARY POWER TRANSISTORS

12 Ampere, 80~100Volts, 150 Watts

NPN 2N6059
NPN 2N6058
PNP 2N6052
PNP 2N6051

TO-3

TO-3
Metal Can Package
RoHS compliant

FEATURES:

High DC Cur H_{fe} =3500 (Typ.) @ I_C=5.00A DC

Collector–Emitter Sustaining Voltage @ 100 mA

$V_{CEO(SUS)}$ =80 VDC (Min.)--- 2N6058

=100 VDC (Min.)--- 2N6059, 2N6052

Monolithic Construction with Built–In Base–Emitter Shunt Resistors

APPLICATIONS: General–purpose amplifier and low frequency switching applications.

ABSOLUTE MAXIMUM RATINGS (T_a = 25 °C)

Rating	Symbol	2N6051 2N6058	2N6052 2N6059	Unit
Collector–Emitter Voltage	V_{CEO}	80	100	Vdc
Collector–Base Voltage	V_{CB}	80	100	Vdc
Emitter–Base voltage	V_{EB}	5.0		Vdc
Collector Current — Continuous Peak	I_C	12 20		Adc
Base Current	I_B	0.2		Adc
Total Device Dissipation @T_C = 25°C Derate above 25°C	P_D	150 0.857		Watts W/°C
Operating and Storage Junction Temperature Range	T_J, T_{stg}	−65 to +200°C		°C

THERMAL CHARACTERISTICS

Characteristic	Symbol	Rating	Unit
Thermal Resistance, Junction to Case	R_{JC}	1.17	°C/W

(1) Indicates JEDEC Registered Data.

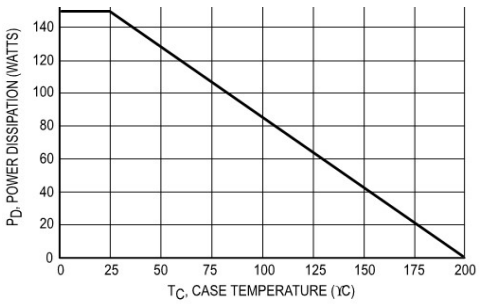

Figure 1. Power Derating

2N6058_59,2N6051_52
Rev0_30042020EM

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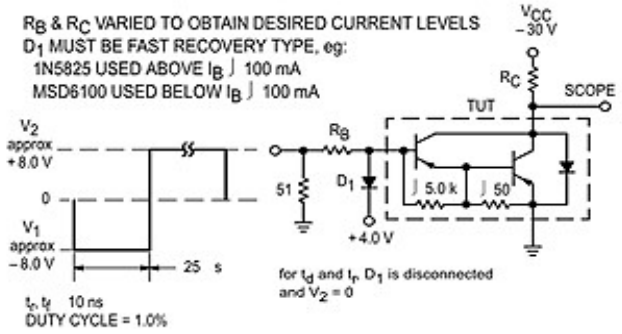
ELECTRICAL CHARACTERISTICS (T_A=25 ° C unless otherwise specified)

Characteristic		Symbol	Min	Max	Unit
OFF CHARACTERISTICS					
Collector–Emitter Sustaining Voltage (1) (I_C = 100 mAdc, I_B = 0)	2N6051, 2N6058 2N6052, 2N6059	$V_{CEO(sus)}$	80 100	— —	Vdc
Collector Cutoff Current (V_{CE} = 40 Vdc, I_B = 0) (V_{CE} = 50 Vdc, I_B = 0)	2N6051, 2N6058 2N6052, 2N6059	I_{CEO}	— —	1.0 1.0	mAdc
Collector Cutoff Current (V_{CE} = Rated V_{CEO}, $V_{BE(off)}$ = 1.5 Vdc) (V_{CE} = Rated V_{CEO}, $V_{BE(off)}$ = 1.5 Vdc, T_C = 150°C)		I_{CEX}	—	0.5 5.0	mAdc
Emitter Cutoff Current (V_{BE} = 5.0 Vdc, I_C = 0)		I_{EBO}	—	2.0	mAdc
ON CHARACTERISTICS (1)					
DC Current Gain (I_C = 6.0 Adc, V_{CE} = 3.0 Vdc) (I_C = 12 Adc, V_{CE} = 3.0 Vdc)		h_{FE}	750 100	18,000 —	—
Collector–Emitter Saturation Voltage (I_C = 6.0 Adc, I_B = 24 mAdc) (I_C = 12 Adc, I_B = 120 mAdc)		$V_{CE(sat)}$	— —	2.0 3.0	Vdc
Base–Emitter Saturation Voltage (I_C = 12 Adc, I_B = 120 mAdc)		$V_{BE(sat)}$	—	4.0	Vdc
Base–Emitter On Voltage (I_C = 6.0 Adc, V_{CE} = 3.0 Vdc)		$V_{BE(on)}$	—	2.8	Vdc
DYNAMIC CHARACTERISTICS					
Magnitude of Common Emitter Small–Signal Short Circuit Forward Current Transfer Ratio (I_C = 5.0 Adc, V_{CE} = 3.0 Vdc, f = 1.0 MHz)		$\|h_{fe}\|$	4.0	—	MHz
Output Capacitance (V_{CB} = 10 Vdc, I_E = 0, f = 0.1 MHz)	2N6051, 2N6052 2N6058/2N6059	C_{ob}	— —	500 300	pF
Small–Signal Current Gain (I_C = 5.0 Adc, V_{CE} = 3.0 Vdc, f = 1.0 kHz)		h_{fe}	300	—	—

* Indicates JEDEC Registered Data.
(1) Pulse test: Pulse Width = 300 s, Duty Cycle = 2.0%.



For NPN test circuit reverse diode and voltage polarities.

Figure 2. Switching Times Test Circuit

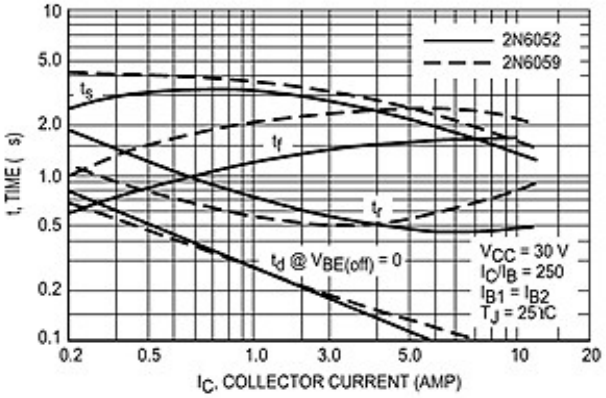


Figure 3. Switching Times

TYPICAL CHARACTEISTICS CURVES

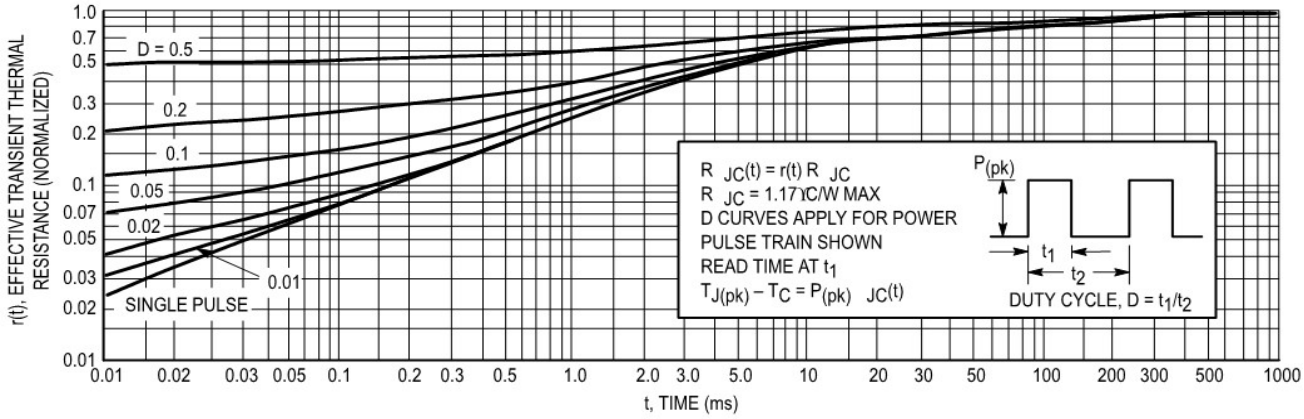


Figure 4. Thermal Response

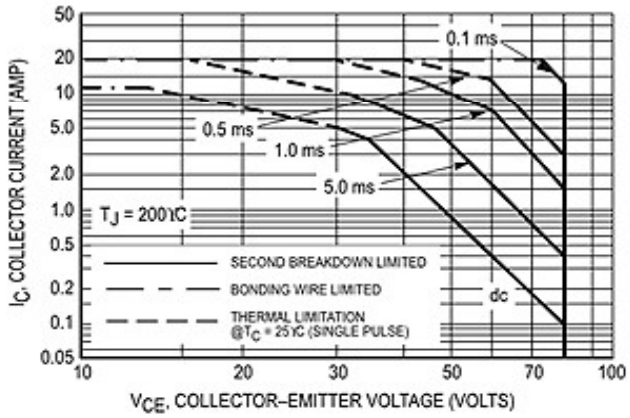


Figure 5. 2N6058 ,2N6051

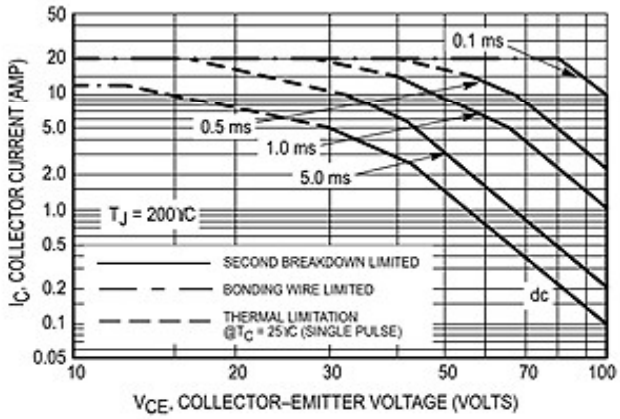


Figure 6. 2N6052, 2N6059

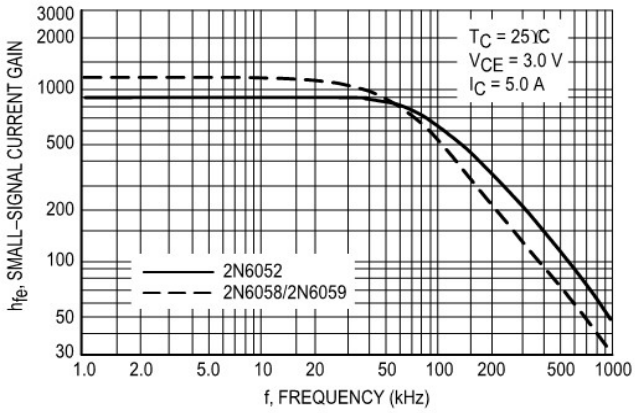


Figure 7. Small–Signal Current Gain

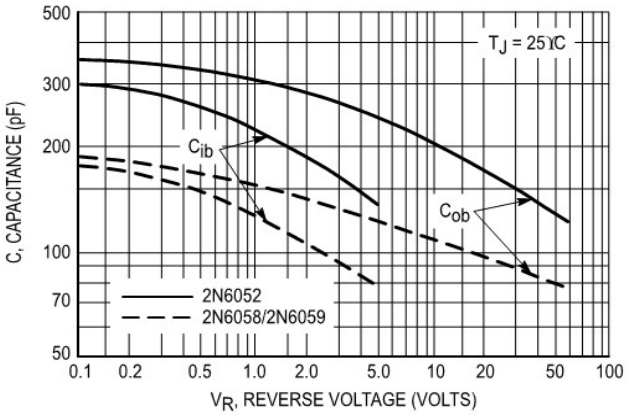


Figure 8. Capacitance

TYPICAL CHARACTEISTICS CURVES

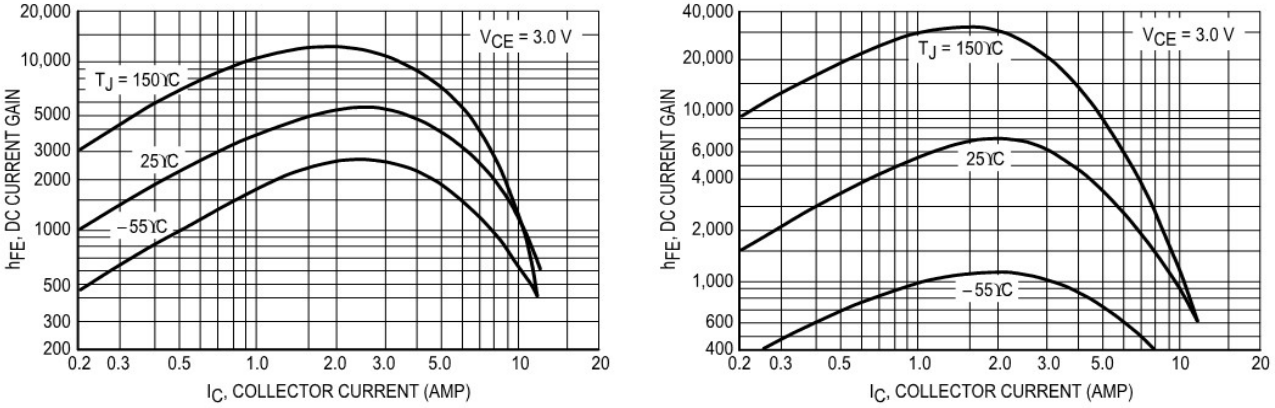


Figure 9. DC Current Gain

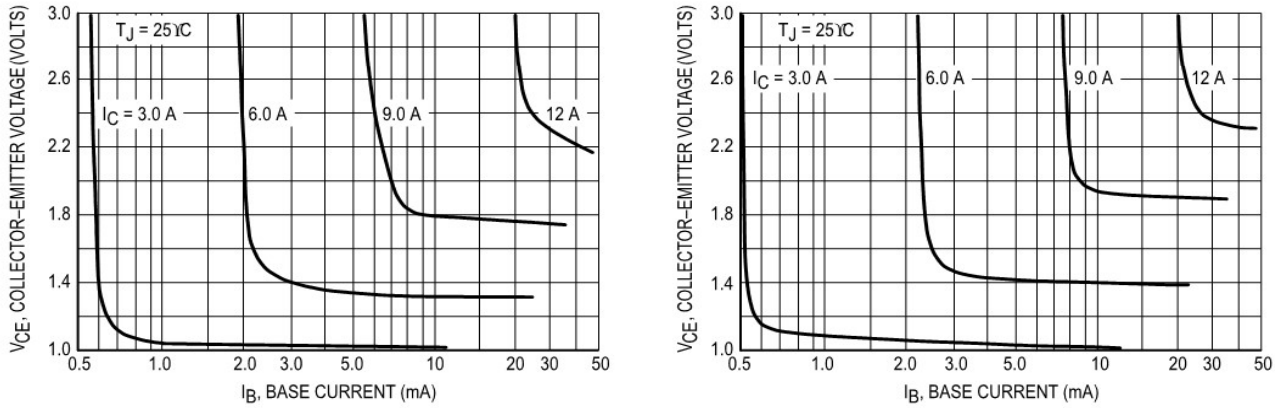


Figure 10. Collector Saturation Region

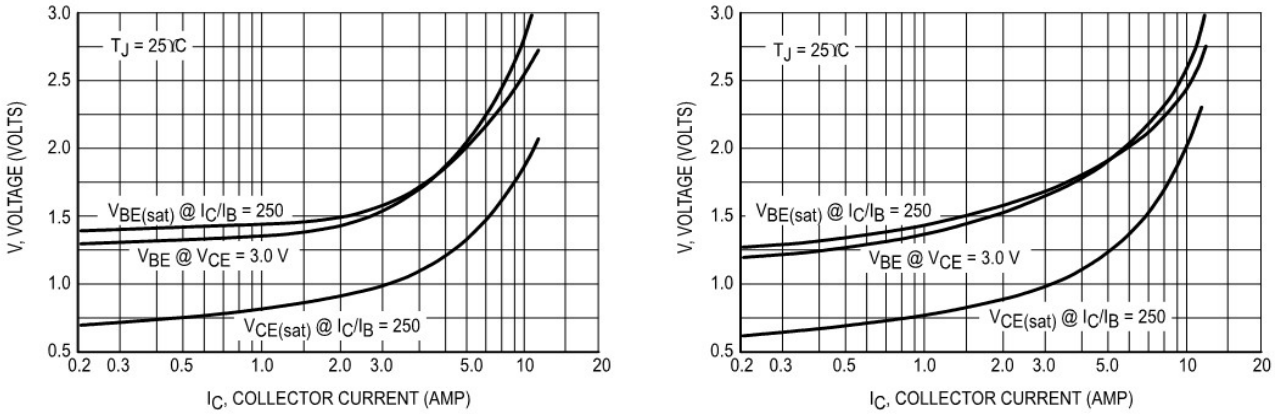
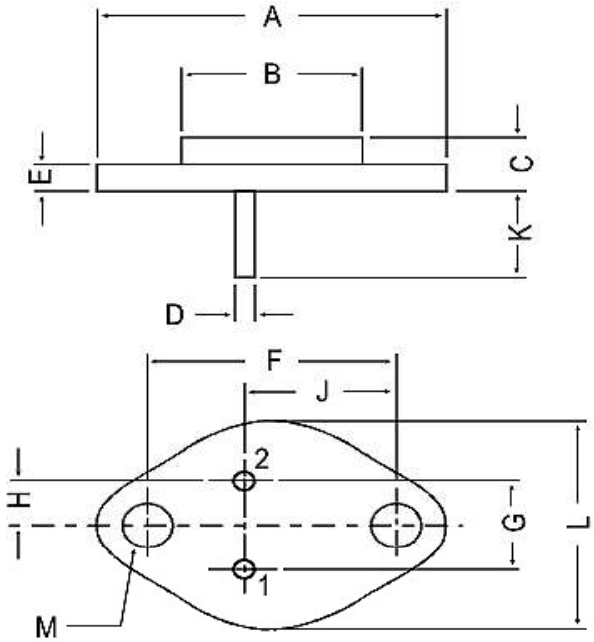


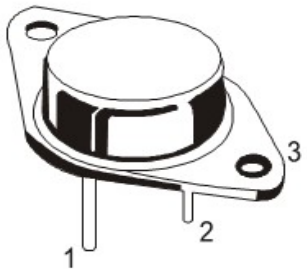
Figure 11. "On" Voltages

Package Details



All dimensions in mm.

DIM	MIN.	MAX.
A	—	39.37
B	—	22.22
C	6.35	8.50
D	0.96	1.09
E	—	1.77
F	29.90	30.40
G	10.69	11.18
H	5.20	5.72
J	16.64	17.15
K	11.15	12.25
L	—	26.67
M	3.84	4.19



PIN CONFIGURATION
1. BASE
2. EMITTER
3. COLLECTOR

Packing Detail

PACKAGE	STANDARD PACK		INNER CARTON BOX		OUTER CARTON BOX		
	Details	Net Weight/Qty	Size	Qty	Size	Qty	Gr Wt
TO-3	100 pcs/pkt	1.3 kg/100 pcs	12.5" x 8" x 1.8"	0.1K	17" x 11.5" x 21"	2K	27.5 kgs

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Recommended Product Storage Environment for Discrete Semiconductor Devices

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

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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