

2N6058 & 2N6059



NPN Darlington Power Silicon Transistors

Rev. V1

Features

- Available in JAN, JANTX, JANTXV per MIL-PRF-19500/502
- TO-3 (TO-204AA) Package



Electrical Characteristics

Parameter	Test Conditions	Symbol	Units	Min.	Max.
Off Characteristics					
Collector - Emitter Breakdown Voltage	$I_C = 100 \text{ mAdc}$, 2N6058 $I_C = 100 \text{ mAdc}$, 2N6059	$V_{(BR)CEO}$	Vdc	80 100	—
Collector - Emitter Cutoff Current	$V_{CE} = 60 \text{ Vdc}$, 2N6058 $V_{CE} = 80 \text{ Vdc}$, 2N6059	I_{CEO}	mAdc	—	500
Collector - Emitter Cutoff Current	$V_{CE} = 80 \text{ Vdc}$, $V_{BE} = 1.5 \text{ Vdc}$, 2N6058 $V_{CE} = 100 \text{ Vdc}$, $V_{BE} = 1.5 \text{ Vdc}$, 2N6059	I_{CEX}	mAdc	—	1.0
Collector - Base Cutoff Current	$V_{BE} = 80 \text{ Vdc}$, 2N6058 $V_{BE} = 100 \text{ Vdc}$, 2N6059	I_{CBO}	mAdc	—	0.5
Collector - Base Cutoff Current	$V_{EB} = 7 \text{ Vdc}$	I_{EBO}	mAdc	—	2.5
On Characteristics¹					
Forward Current Transfer Ratio	$I_C = 1 \text{ Adc}$, $V_{CE} = 3 \text{ Vdc}$; pulsed $I_C = 6 \text{ Adc}$, $V_{CE} = 3 \text{ Vdc}$; pulsed $I_C = 12 \text{ Adc}$, $V_{CE} = 3 \text{ Vdc}$; pulsed	h_{FE}	-	— 1000 150	1000 18000 —
Collector - Emitter Saturation Voltage	$I_C = 12 \text{ Adc}$, $I_B = 120 \text{ mAdc}$ $I_C = 6 \text{ Adc}$, $I_B = 24 \text{ mAdc}$	$V_{CE(SAT)}$	Vdc	—	3.0 2.0
Base - Emitter Voltage	$I_C = 12 \text{ Adc}$, $I_B = 120 \text{ mAdc}$; pulsed	$V_{BE(SAT)}$	Vdc	—	4.0
Base - Emitter Voltage	$I_C = 12 \text{ Adc}$, $V_{CE} = 3 \text{ Vdc}$	V_{BE}	Vdc	—	2.8
Dynamic Characteristics					
Magnitude of Common Small-Signal Short-Circuit Forward Current Transfer Ratio	$I_C = 5 \text{ Adc}$, $V_{CE} = 3 \text{ Vdc}$, $f = 1 \text{ MHz}$	$ h_{FE} $	-	10	250
Small-Signal Short-Circuit Forward Current Transfer Ratio	$I_C = 5 \text{ Adc}$, $V_{CE} = 3 \text{ Vdc}$, $f = 1 \text{ kHz}$	h_{FE}	-	1000	—
Output Capacitance	$V_{CB} = 10 \text{ Vdc}$, $I_E = 0$, $100 \text{ kHz} \leq f \leq 1 \text{ MHz}$	C_{OBO}	pF	—	300
Switching Characteristics					
Turn-On Time	$V_{CC} = 30 \text{ Vdc}$; $I_C = 5 \text{ Adc}$; $I_B = 20 \text{ mAdc}$	T_{ON}	μs	—	2
Turn-Off Time	$V_{CC} = 30 \text{ Vdc}$; $I_C = 5 \text{ Adc}$; $I_{B1} = I_{B2} = 20 \text{ mAdc}$	T_{OFF}	μs	—	10
Safe Operating Area					
DC Tests:	$T_C = +25^\circ\text{C}$, $+10^\circ\text{C}$, 1 Cycle, $t \geq 1\text{s}$; 1 cycle				
Test 1:	$V_{CE} = 12.5 \text{ Vdc}$, $I_C = 12 \text{ Adc}$				
Test 2:	$V_{CE} = 30 \text{ Vdc}$, $I_C = 5 \text{ Adc}$				
Test 3:	$V_{CE} = 70 \text{ Vdc}$, $I_C = 200 \text{ mAdc}$, 2N6058				
	$V_{CE} = 90 \text{ Vdc}$, $I_C = 155 \text{ mAdc}$, 2N6059				

1. Pulse Test: Pulse Width = 300 μs , Duty Cycle $\leq 2.0\%$.

NPN Darlington Power Silicon Transistors

Rev. V1

Absolute Maximum Ratings

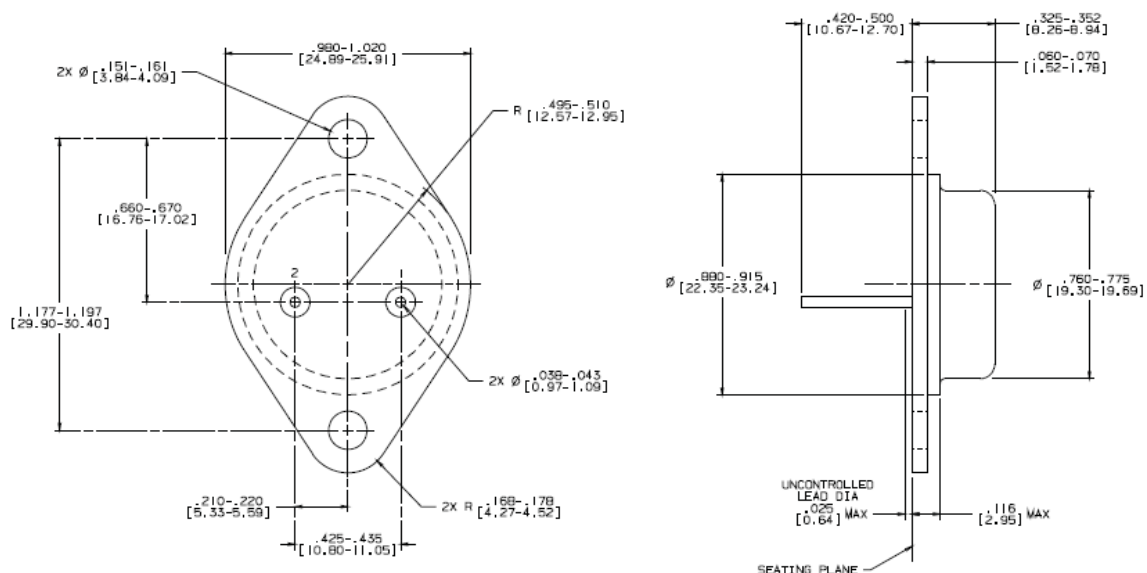
Ratings	Symbol	Value
Collector - Emitter Voltage 2N6058 2N6059	V_{CEO}	80 Vdc 100 Vdc
Collector - Base Voltage 2N6058 2N6059	V_{CBO}	80 Vdc 100 Vdc
Emitter - Base Voltage	V_{EBO}	5 Vdc
Collector Current	I_C	12 Adc
Base Current	I_B	0.2 Adc
Total Power Dissipation @ $T_C = +25^\circ\text{C}$ @ $T_C = +100^\circ\text{C}$	P_T	150 W 75 W
Operating & Storage Temperature Range	T_{OP}, T_{STG}	-55°C to $+175^\circ\text{C}$

2. Derate linearly @ 1 W/°C for $T_C > +25^\circ\text{C}$.

Thermal Characteristics

Characteristics	Symbol	Max. Value
Thermal Resistance, Junction to Case	$R_{\theta JC}$	1°C/W

Outline Drawing



NOTES:

1. STANDARD HEADER TYPE SOLID BASE.
2. STANDARD LEAD FINISH PER MIL-M-38510 TYPE X OR EQUIVALENT.
3. LEAD NOT BENT GREATER THAN 15°.
4. DIMENSIONS BASED ON JEDEC STANDARD TO-3 PUBLICATION 95, PA

MACOM Technology Solutions Inc. All rights reserved.

Information in this document is provided in connection with MACOM Technology Solutions Inc ("MACOM") products. These materials are provided by MACOM as a service to its customers and may be used for informational purposes only. Except as provided in MACOM's Terms and Conditions of Sale for such products or in any separate agreement related to this document, MACOM assumes no liability whatsoever. MACOM assumes no responsibility for errors or omissions in these materials. MACOM may make changes to specifications and product descriptions at any time, without notice. MACOM makes no commitment to update the information and shall have no responsibility whatsoever for conflicts or incompatibilities arising from future changes to its specifications and product descriptions. No license, express or implied, by estoppel or otherwise, to any intellectual property rights is granted by this document.

THESE MATERIALS ARE PROVIDED "AS IS" WITHOUT WARRANTY OF ANY KIND, EITHER EXPRESS OR IMPLIED, RELATING TO SALE AND/OR USE OF MACOM PRODUCTS INCLUDING LIABILITY OR WARRANTIES RELATING TO FITNESS FOR A PARTICULAR PURPOSE, CONSEQUENTIAL OR INCIDENTAL DAMAGES, MERCHANTABILITY, OR INFRINGEMENT OF ANY PATENT, COPYRIGHT OR OTHER INTELLECTUAL PROPERTY RIGHT. MACOM FURTHER DOES NOT WARRANT THE ACCURACY OR COMPLETENESS OF THE INFORMATION, TEXT, GRAPHICS OR OTHER ITEMS CONTAINED WITHIN THESE MATERIALS. MACOM SHALL NOT BE LIABLE FOR ANY SPECIAL, INDIRECT, INCIDENTAL, OR CONSEQUENTIAL DAMAGES, INCLUDING WITHOUT LIMITATION, LOST REVENUES OR LOST PROFITS, WHICH MAY RESULT FROM THE USE OF THESE MATERIALS.

MACOM products are not intended for use in medical, lifesaving or life sustaining applications. MACOM customers using or selling MACOM products for use in such applications do so at their own risk and agree to fully indemnify MACOM for any damages resulting from such improper use or sale.