



## NPN DARLINGTON POWER SILICON TRANSISTOR

Qualified per MIL-PRF-19500/502

Devices Qualified Level

2N6058 2N6059

JANTX JANTXV

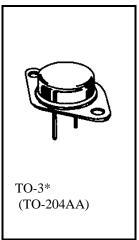
#### **MAXIMUM RATINGS**

Ratings	Symbol	2N6058	2N6059	Units
Collector-Emitter Voltage	$V_{CEO}$	80	100	Vdc
Collector-Base Voltage	$V_{CBO}$	80	100	Vdc
Emitter-Base Voltage	$V_{EBO}$	5	.0	Vdc
Base Current	$I_{\mathrm{B}}$	0	.2	Adc
Collector Current	$I_{C}$	1	2	Adc
Total Power Dissipation <sup>(1)</sup> @ $T_C = +25^{\circ}C$	D	1:	50	W
$^{\circ}$	$P_{T}$	7	5	W
Operating & Storage Junction Temperature Range	T <sub>J</sub> , T <sub>stg</sub>	-55 to	+175	°C

#### THERMAL CHARACTERISTICS

Characteristics	Symbol	Max.	Unit
Thermal Resistance, Junction-to-Case	$R_{ heta JC}$	1.0	<sup>0</sup> C/W

<sup>1)</sup> Derate linearly at 1.0 W/ $^{\circ}$ C above T<sub>C</sub> > +25 $^{\circ}$ C



\*See appendix A for package outline

## ELECTRICAL CHARACTERISTICS ( $T_C = 25^{\circ}$ C unless otherwise noted)

Characteristic	es	Symbol	Min.	Max.	Unit
OFF CHARACTERISTICS					
Collector-Emitter Breakdown Voltage					
$I_C = 100 \text{ mAdc}$	2N6058	$V_{(BR)CEO}$	80		Vdc
	2N6059		100		
Collector-Emitter Cutoff Current					
$V_{CE} = 40 \text{ Vdc}$	2N6058	$I_{CEO}$		1.0	mAdc
$V_{CE} = 50 \text{ Vdc}$	2N6059			1.0	
Collector-Emitter Cutoff Current					
$V_{CE} = 80 \text{ Vdc}, V_{BE} = 1.5 \text{ Vdc}$	2N6058	$I_{CEX}$		0.5	mAdc
$V_{CE} = 100 \text{ Vdc}, V_{BE} = 1.5 \text{ Vdc}$	2N6059			0.5	
Emitter-Base Cutoff Current					
$V_{EB} = 5.0 \text{ Vdc}$		$I_{\mathrm{EBO}}$		2.0	mAdc

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### 2N6058, 2N6059 JAN SERIES

ELECTRICAL CHARACTERISTICS (con't)

Characteristics	Symbol	Min.	Max.	Unit
ON CHARACTERISTICS (2)				
Forward-Current Transfer Ratio				
$I_C = 1.0 \text{ Adc}, V_{CE} = 3.0 \text{ Vdc}$		1,000		
$I_C = 6.0 \text{ Adc}, V_{CE} = 3.0 \text{ Vdc}$	$h_{FE}$	1,000	18,000	
$I_C = 12 \text{ Adc}, V_{CE} = 3.0 \text{ Vdc}$		150		
Collector-Emitter Saturation Voltage				
$I_C = 12 \text{ Adc}, I_B = 120 \text{ mAdc}$	$V_{CE(sat)}$		3.0	Vdc
$I_C = 6.0 \text{ Adc}, I_B = 24 \text{ mAdc}$	, ,		2.0	
Base-Emitter Saturation Voltage				
$I_C = 12 \text{ Adc}, I_B = 120 \text{ mAdc}$	$V_{BE(sat)}$		4.0	Vdc
Base-Emitter Voltage				
$I_C = 6.0 \text{ Adc}, V_{CE} = 3.0 \text{ Vdc}$	$ m V_{BE}$		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} $	10	250	
Small-Signal Short-Circuit Forward Current Transfer Ratio				
$I_C = 5.0 \text{ Adc}, V_{CE} = 3.0 \text{ Vdc}, f = 1.0 \text{ kHz}$	$h_{fe}$	1,000		
Output Capacitance				
$V_{CB} = 10 \text{ Vdc}, I_{E} = 0, 100 \text{ kHz} \le f \le 1.0 \text{ MHz}$	$C_{ m obo}$		300	pF
SWITCHING CHARACTERISTICS				
Turn-On Time				
$V_{CC} = 30 \text{ Vdc}; I_C = 5.0 \text{ Adc}; I_B = 20 \text{ mAdc}$	<sup>t</sup> on		2.0	μs
Turn-Off Time				
$V_{CC} = 30 \text{ Vdc}$ ; $I_C = 5.0 \text{ Adc}$ ; $I_{B1} = I_{B2} = 20 \text{ mAdc}$	<sup>t</sup> off		10	μs
SAFE OPERATING AREA				
DC Tests				
$T_C = +25^{\circ}C + 10^{\circ}C$ , $-0^{\circ}$ , 1 Cycle, $t \ge 1.0$ s				
Test 1				
$V_{CE} = 12.5 \text{ Vdc}, I_{C} = 12 \text{ Adc}$				
Test 2				

 $V_{CE} = 30 \text{ Vdc}, I_C = 5.0 \text{ Adc}$ 

Test 3

 $V_{CE} = 70 \text{ Vdc}, I_C = 200 \text{ mAdc}$ 

2N6058

 $V_{CE} = 90 \text{ Vdc}, I_C = 155 \text{ mAdc}$ 

2N6059

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<sup>(2)</sup> Pulse Test: Pulse Width = 300µs, Duty Cycle ≤ 2.0%.

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