



NPN High Power Silicon Transistors

2N6676 & 2N6678

Features

- Available in JAN, JANTX, and JANTXV per MIL-PRF-19500/538
- TO-3 (TO-204AA) Package



Maximum Ratings

Ratings	Symbol	2N6676	2N6678	Units
Collector - Emitter Voltage	V_{CEO}	300	400	Vdc
Collector - Base Voltage	V_{CBO}	450	650	Vdc
Collector - Base Voltage	V_{CBX}	450	650	Vdc
Emitter - Base Voltage	V_{EBO}	8.0		Vdc
Base Current	I_B	5.0		Adc
Collector Current	I_C	15		Adc
Total Power Dissipation @ $T_A = +25^\circ\text{C}$ ⁽¹⁾ @ $T_A = +25^\circ\text{C}$	P_T	6.0 ⁽²⁾ 175	3.0 ⁽³⁾ 175	W W
Operating & Storage Temperature Range	T_{op}, T_{stg}	-65 to +200		$^\circ\text{C}$

Thermal Characteristics

Characteristics	Symbol	Maximum	Units
Thermal Resistance, Junction-to-Case	$R_{\theta JC}$	1.0	$^\circ\text{C}/\text{W}$

1) Derate linearly @ 1.0 mW/ $^\circ\text{C}$ for $T_A > +25^\circ\text{C}$

2) Derate linearly @ 34.2 mW/ $^\circ\text{C}$ for $T_A > +25^\circ\text{C}$

3) Derate linearly @ 17.1 mW/ $^\circ\text{C}$ for $T_A > +25^\circ\text{C}$

Electrical Characteristics

OFF Characteristics	Symbol	Mimimum	Maximum	Units
Collector - Emitter Breakdown Voltage $I_C = 200 \text{ mAdc}$	$V_{(BR)CEO}$	2N6676 300	---	Vdc
2N6678 400				
Collector - Emitter Cutoff Current $V_{CE} = 450 \text{ Vdc}, V_{BE} = -1.5 \text{ Vdc}$ $V_{CE} = 650 \text{ Vdc}, V_{BE} = -1.5 \text{ Vdc}$	I_{CEX}	2N6676 ---	0.1 0.1	Adc
2N6678 ---				
Emitter - Base Cutoff Current $V_{EB} = 7.0 \text{ Vdc}$	I_{EBO}	---	2.0	mAdc
Collector - Base Cutoff Current $V_{CB} = 450 \text{ Vdc}$ $V_{CB} = 650 \text{ Vdc}$	I_{CBO}	2N6676 ---	1.0 1.0	mAdc
2N6678 ---				

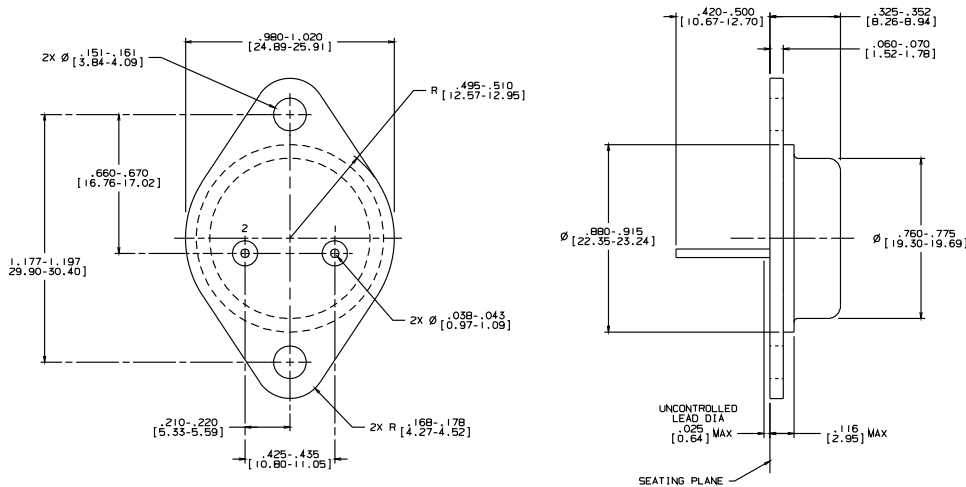


Electrical Characteristics -con't

ON Characteristics (2)				
	Symbol	Minimum	Maximum	Unit
Forward Current Transfer Ratio $I_C = 1.0 \text{ Adc}, V_{CE} = 3.0 \text{ Vdc}$ $I_C = 15.0 \text{ Adc}, V_{CE} = 3.0 \text{ Vdc}$	H_{FE}	15 8	40 20	
Collector - Emitter Saturation Voltage $I_C = 15.0 \text{ Adc}, I_B = 3.0 \text{ Adc}$	$V_{CE(sat)}$	- - -	1.0	Vdc
Base - Emitter Saturation Voltage $I_C = 15.0 \text{ Adc}, I_B = 3.0 \text{ Vdc}$	$V_{BE(sat)}$	- - -	1.5	Vdc
DYNAMIC Characteristic				
Small-Signal Short-Circuit Forward Current Transfer Ratio $I_C = 1.0 \text{ Adc}, V_{CE} = 10 \text{ Vdc}, f = 5.0 \text{ kHz}$	$ h_{fe} $	3.0	10	
Output Capacitance $V_{CB} = 10 \text{ Vdc}, I_E = 0, 100 \text{ kHz} \leq f \leq 1.0 \text{ MHz}$	C_{obo}	150	500	pF
Switching Characteristic				
Delay Time	t_d		0.1	μs
Rise Time	t_r		0.6	μs
Storage Time	t_s	See Figure 3 of MIL-PRF-19500/538	2.5	μs
Fall Time	t_f		0.5	μs
Cross-Over Time	t_c		0.5	μs
SAFE OPERATING AREA				
DC Tests:	$T_C = +25 \text{ }^\circ\text{C}, 1 \text{ Cycle}, t = 1.0 \text{ s}$ (See Figure 4 of MIL-PRF-19500/537)			
Test 1:	$V_{CE} = 11.7 \text{ Vdc}, I_C = 15 \text{ Adc}$			
Test 2:	$V_{CE} = 30 \text{ Vdc}, I_C = 5.9 \text{ Adc}$			
TEST 3:	$V_{CE} = 100 \text{ Vdc}, I_C = 0.25 \text{ Adc}$			
TEST 4:	$V_{CE} = 25 \text{ Vdc}, I_C = 7.0 \text{ Adc}$			
TEST 5:	$V_{CE} = 300 \text{ Vdc}, I_C = 20 \text{ mAdc}$	2N6676		
	$V_{CE} = 400 \text{ Vdc}, I_C = 10 \text{ mAdc}$	2N6678		
Clamped Switching				
$T_A = 25 \text{ }^\circ\text{C}, V_{CC} = 15 \text{ Vdc}$				
$I_C = 15 \text{ Adc}, \text{Clamp Voltage} = 350$	2N6676			
$I_C = 15 \text{ Adc}, \text{Clamp Voltage} = 450$	2N6678			

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

Outline Drawing



- NOTES:
 1. STANDARD HEADER TYPE SOLID BASE.
 2. STANDARD LEAD FINISH PER MIL-M-58510 TYPE X OR EQUIVALENT.
 3. LEAD NOT BENT GREATER THAN 15°.
 4. DIMENSIONS BASED ON JEDEC STANDARD TO-3 PUBLICATION 95, PA

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Our passion for performance is defined by three attributes represented by these three icons: solution-minded, performance-driven and customer-focused.