

# 2N6676 & 2N6678



## NPN High Power Silicon Transistor

Rev. V1

### Features

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



### Electrical Characteristics

Parameter	Test Conditions	Symbol	Units	Min.	Max.
<b>Off Characteristics</b>					
Collector - Emitter Breakdown Voltage	$I_C = 200 \text{ mAdc}$ , 2N6676 $I_C = 200 \text{ mAdc}$ , 2N6678	$V_{(BR)CEO}$	Vdc	300 400	—
Collector - Emitter Cutoff Current	$V_{CE} = 450 \text{ Vdc}$ , $V_{BE} = -1.5 \text{ Vdc}$ , 2N6676 $V_{CE} = 650 \text{ Vdc}$ , $V_{BE} = -1.5 \text{ Vdc}$ , 2N6678	$I_{CEX}$	$\mu\text{Adc}$	—	1.0
Emitter - Base Cutoff Current	$V_{EB} = 7 \text{ Vdc}$	$I_{EBO}$	mAdc	—	2.0
Collector - Base Cutoff Current	$V_{CB} = 450 \text{ Vdc}$ , 2N6676 $V_{CB} = 650 \text{ Vdc}$ , 2N6678	$I_{CBO}$	mAdc	—	1.0
<b>On Characteristics<sup>1</sup></b>					
Forward Current Transfer Ratio	$I_C = 1 \text{ Adc}$ , $V_{CE} = 3 \text{ Vdc}$ $I_C = 15 \text{ Adc}$ , $V_{CE} = 3 \text{ Vdc}$	$H_{FE}$	-	15 8	40 20
Collector - Emitter Sustaining Voltage	$I_C = 15 \text{ Adc}$ , $I_B = 3 \text{ Adc}$	$V_{CE(SAT)}$	Vdc	—	1.0
Base - Emitter Saturation Voltage	$I_C = 15 \text{ Adc}$ , $I_B = 3 \text{ Adc}$	$V_{BE(SAT)}$	Vdc	—	1.5
<b>Dynamic Characteristics</b>					
Small-Signal Short-Circuit Forward Current Transfer Ratio	$I_C = 1 \text{ Adc}$ , $V_{CE} = 10 \text{ Vdc}$ , $f = 5 \text{ kHz}$	$ H_{FE} $	-	3	10
Output Capacitance	$V_{CB} = 10 \text{ Vdc}$ , $I_E = 0$ , $100 \text{ kHz} \leq f \leq 1 \text{ MHz}$	$C_{OBO}$	pF	150	500

1. Pulse Test: Pulse Width = 300  $\mu\text{s}$ , Duty Cycle  $\leq 2.0\%$ .

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Parameter	Test Conditions	Symbol	Units	Min.	Max.
<b>Switching Characteristics</b>					
Delay Time	See figure 12 of MIL-PRF-19500/538	$T_D$	$\mu\text{s}$	—	0.1
Rise Time		$T_R$			0.6
Storage Time		$T_S$			2.5
Fall Time		$T_F$			0.5
Cross-Over Time		$T_C$			0.5
<b>Safe Operating Area</b>					
DC Tests: $T_C = +25^\circ\text{C}$ , 1 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: $V_{CE} = 300\text{ Vdc}$ , $I_C = 20\text{ mAdc}$ , (for 2N6676) Test 5: $V_{CE} = 400\text{ Vdc}$ , $I_C = 10\text{ mAdc}$ , (for 2N6678)  Clamped Switch: $T_A = +25^\circ\text{C}$ , $V_{CC} = 15\text{ Vdc}$ Clamp Voltage = 350; $I_C = 15\text{ Adc}$ , (2N6676) Clamp Voltage = 450; $I_C = 15\text{ Adc}$ , (2N6678)					

### Absolute Maximum Ratings

Ratings	Symbol	2N6676	2N6678	Units
Collector - Emitter Voltage	$V_{CEO}$	300	400	Vdc
Collector - Base Voltage	$V_{CBO}/V_{CBX}$	450	650	Vdc
Emitter - Base Voltage	$V_{EBO}$	8		Vdc
Collector Current	$I_C$	15		Adc
Base Current	$I_B$	5		Adc
Total Power Dissipation @ $T_A = +25^\circ\text{C}^2$ @ $T_A = +25^\circ\text{C}$	$P_T$	6 175		W
Operating & Storage Temperature Range	$T_{OP}, T_{STG}$	-65 to +200		$^\circ\text{C}$

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

### Thermal Characteristics

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

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