

## NPN POWER SILICON SWITCHING TRANSISTOR

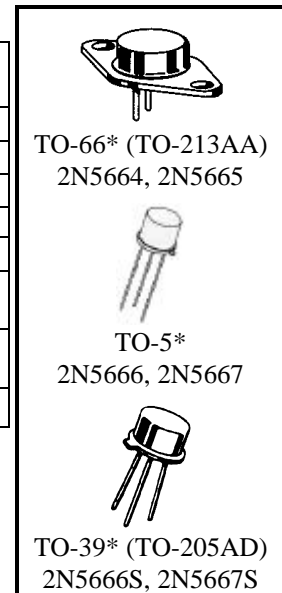
Qualified per MIL-PRF-19500/455

Devices	Qualified Level	Devices	Qualified Level
2N5664 2N5665	JAN JANTX JANTXV	2N5666 2N5667 2N5666S 2N5667S	JAN JANTX JANTXV JANS

### MAXIMUM RATINGS

Ratings	Symbol	2N5664 2N5666, S	2N5665 2N5667, S	Unit	
Collector-Emitter Voltage	$V_{CEO}$	200	300	Vdc	
Collector-Base Voltage	$V_{CBO}$	250	400	Vdc	
Emitter-Base Voltage	$V_{EBO}$	6.0		Vdc	
Base Current	$I_B$	1.0		Adc	
Collector Current	$I_C$	5.0		Adc	
Total Power Dissipation	@ $T_A = +25^{\circ}\text{C}$ @ $T_C = +100^{\circ}\text{C}$	$P_T$	2.5 <sup>(1)</sup>	1.2 <sup>(2)</sup>	W
			30 <sup>(3)</sup>	15 <sup>(4)</sup>	W
Operating & Storage Junction Temperature Range	$T_J, T_{stg}$	-65 to +200		$^{\circ}\text{C}$	

- 1) Derate linearly 14.3 mW/ $^{\circ}\text{C}$  for  $T_A > +25^{\circ}\text{C}$
- 2) Derate linearly 6.9 mW/ $^{\circ}\text{C}$  for  $T_A > +25^{\circ}\text{C}$
- 3) Derate linearly 300 mW/ $^{\circ}\text{C}$  for  $T_C > +100^{\circ}\text{C}$
- 4) Derate linearly 150 mW/ $^{\circ}\text{C}$  for  $T_C > +100^{\circ}\text{C}$



\*See appendix A for package outline

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

Characteristics	Symbol	Min.	Max.	Unit
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#### OFF CHARACTERISTICS

Collector-Emitter Breakdown Voltage $I_C = 10 \text{ mAdc}$	2N5664, 2N5666, S 2N5665, 2N5667, S	$V_{(BR)CER}$	250 400	Vdc
Emitter-Base Breakdown Voltage $I_E = 10 \mu\text{Adc}$		$V_{(BR)EBO}$	6.0	Vdc
Collector-Emitter Cutoff Current $V_{CE} = 200 \text{ Vdc}$ $V_{CE} = 300 \text{ Vdc}$	2N5664, 2N5666, S 2N5665, 2N5667, S	$I_{CES}$	0.2 0.2	$\mu\text{Adc}$

**ELECTRICAL CHARACTERISTICS (con't)**

Characteristics	Symbol	Min.	Max.	Unit
Collector-Base Cutoff Current				
$V_{CB} = 200$ Vdc 2N5664, 2N5666, S	I <sub>CBO</sub>		0.1	μAdc
$V_{CB} = 250$ Vdc		1.0	mAdc	
$V_{CB} = 300$ Vdc 2N5665, 2N5667, S		0.1	μAdc	
$V_{CB} = 400$ Vdc		1.0	mAdc	

**ON CHARACTERISTICS <sup>(5)</sup>**

Forward-Current Transfer Ratio				
$I_C = 0.5$ Adc, $V_{CE} = 2.0$ Vdc 2N5664, 2N5666, S	h <sub>FE</sub>	40		
		25		
$I_C = 1.0$ Adc, $V_{CE} = 5.0$ Vdc 2N5664, 2N5666, S		40	120	
		25	75	
$I_C = 3.0$ Adc, $V_{CE} = 5.0$ Vdc 2N5664, 2N5666, S		15		
		10		
$I_C = 5.0$ Adc, $V_{CE} = 5.0$ Vdc All Types		5.0		
Collector-Emitter Saturation Voltage				
$I_C = 3.0$ Adc, $I_B = 0.3$ Adc 2N5664, 2N5666, S	V <sub>CE(sat)</sub>		0.4	Vdc
$I_C = 3.0$ Adc, $I_B = 0.6$ Adc 2N5665, 2N5667, S		0.4		
$I_C = 5.0$ Adc, $I_B = 1.0$ Adc All Types		1.0		
Base-Emitter Saturation Voltage				
$I_C = 3.0$ Adc, $I_B = 0.3$ Adc 2N5664, 2N5666, S	V <sub>BE(sat)</sub>		1.2	Vdc
$I_C = 3.0$ Adc, $I_B = 0.6$ Adc 2N5665, 2N5667, S		1.2		
$I_C = 5.0$ Adc, $I_B = 1.0$ Adc All Types		1.5		

**DYNAMIC CHARACTERISTICS**

Forward Current Transfer Ratio				
$I_C = 0.5$ Adc, $V_{CE} = 5.0$ Vdc, $f = 10$ MHz	h <sub>fe</sub>	2.0	7.0	
Output Capacitance				
$V_{CB} = 10$ Vdc, $I_E = 0$ , $100$ kHz ≤ f ≤ $1.0$ MHz	C <sub>obo</sub>		120	pF

**SWITCHING CHARACTERISTICS**

Turn-On Time				
$V_{CC} = 100$ Vdc; $I_C = 1.0$ Adc; $I_{B1} = 30$ mAdc	t <sub>on</sub>		0.25	μs
Turn-Off Time				
$V_{CC} = 30$ Vdc; $I_C = 1.0$ Adc; $I_{B1} = -I_{B2} = 50$ mAdc 2N5664, 2N5666, S	t <sub>off</sub>		1.5	μs
2N5665, 2N5667, S		2.0		

**SAFE OPERATING AREA**

<b>DC Tests</b> (2N5664 and 2N5665 only)				
$T_C = 100^\circ\text{C}$ , 1 Cycle, $t \geq 1.0$ s, $t_r + t_f = 10$ μs				
<b>Test 1</b>				
$V_{CE} = 6.0$ Vdc, $I_C = 5.0$ Adc	2N5664 and 2N5665			
$V_{CE} = 3.0$ Vdc, $I_C = 5.0$ Adc	2N5666 and 2N5667			
<b>Test 2</b>				
$V_{CE} = 40$ Vdc, $I_C = 0.75$ Adc	2N5664 and 2N5665			
$V_{CE} = 37.5$ Vdc, $I_C = 0.4$ Adc	2N5666 and 2N5667			
<b>Test 3</b>				
$V_{CE} = 200$ Vdc, $I_C = 43$ mAdc	2N5664			
$V_{CE} = 200$ Vdc, $I_C = 27$ mAdc	2N5666			
<b>Test 4</b>				
$V_{CE} = 300$ Vdc, $I_C = 21$ mAdc	2N5665			
$V_{CE} = 300$ Vdc, $I_C = 14$ mAdc	2N5667			

(5) Pulse Test: Pulse Width = 300μs, Duty Cycle ≤ 2.0%.

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Datasheets for electronics components.