

NPN POWER SILICON SWITCHING TRANSISTOR

Qualified per MIL-PRF-19500/455

Devices

2N5664 2N5665

Qualified Level

JAN
JANTX
JANTXV

Devices

2N5666 2N5667
2N5666S 2N5667S

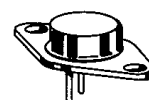
Qualified Level

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	
		2N5664 2N5665	2N5666, S 2N5667, S		
Total Power Dissipation	@ $T_A = +25^{\circ}\text{C}$	P_T	2.5 ⁽¹⁾	1.2 ⁽²⁾	W
	@ $T_C = +100^{\circ}\text{C}$		30 ⁽³⁾	15 ⁽⁴⁾	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 $T_C > +100^{\circ}\text{C}$



TO-66* (TO-213AA)
2N5664, 2N5665



TO-5*
2N5666, 2N5667



TO-39* (TO-205AD)
2N5666S, 2N5667S

*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	μAdc

ELECTRICAL CHARACTERISTICS (con't)

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

ON CHARACTERISTICS ⁽⁵⁾

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

DYNAMIC CHARACTERISTICS

Forward Current Transfer Ratio				
$I_C = 0.5 \text{ Adc}, V_{CE} = 5.0 \text{ Vdc}, f = 10 \text{ MHz}$	$ h_{fe} $	2.0	7.0	
Output Capacitance				
$V_{CB} = 10 \text{ Vdc}, I_E = 0, 100 \text{ kHz} \leq f \leq 1.0 \text{ MHz}$	C_{obo}		120	pF

SWITCHING CHARACTERISTICS

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

SAFE OPERATING AREA

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

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