

NPN POWER SILICON TRANSISTOR

2N5660

2N5661

2N5662

2N5663

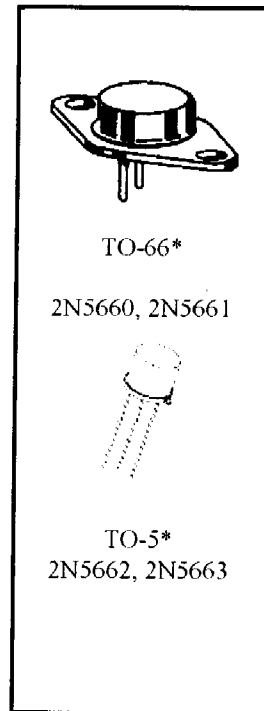
MAXIMUM RATINGS

Ratings	Symbol	2N5660	2N5661	Unit
		2N5662	2N5663	
Collector-Emitter Voltage	V_{CE0}	200	300	Vdc
Collector-Base Voltage	V_{CB0}	250	400	Vdc
Collector-Emitter Voltage	V_{CER}	250	400	Vdc
Emitter-Base Voltage	V_{EB0}	6.0		Vdc
Base Current	I_B	0.5		Adc
Collector Current	I_C	2.0		Adc
		2N5660	2N5662	
		2N5661	2N5663	
Total Power Dissipation (@ $T_A = +25^\circ\text{C}$ @ $T_C = +100^\circ\text{C}$)	P_T	2.0 ⁽¹⁾	1.0 ⁽²⁾	W
		20 ⁽³⁾	15 ⁽⁴⁾	W
Operating & Storage Junction Temperature Range	T_J, T_{stg}	-65 to +200		$^\circ\text{C}$

THERMAL CHARACTERISTICS

Characteristics	Symbol	2N5660	2N5662	Unit
		2N5661	2N5663	
Thermal Resistance, Junction-to-Case	$R_{\theta JC}$	5.0	6.67	$^\circ\text{C}/\text{W}$
Junction-to-Ambient	$R_{\theta JA}$	87.5	145.8	

- 1) Derate linearly 11.4 mW/ $^\circ\text{C}$ for $T_A > +25^\circ\text{C}$
- 2) Derate linearly 5.7 mW/ $^\circ\text{C}$ for $T_A > +25^\circ\text{C}$
- 3) Derate linearly 200 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)

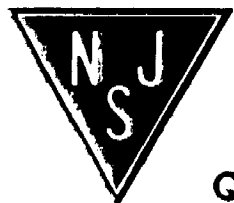
Characteristics	Symbol	Min.	Max.	Unit
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OFF CHARACTERISTICS

Collector-Emitter Breakdown Voltage $I_C = 10 \text{ mAdc}$	2N5660, 2N5662 2N5661, 2N5663	$V_{(BR)CE0}$	200 300	Vdc
Collector-Base Breakdown Voltage $I_C = 10 \text{ mAdc}, R_{BE} = 100\Omega$	2N5660, 2N5662 2N5661, 2N5663	$V_{(BR)CER}$	250 400	Vdc
Emitter-Base Breakdown Voltage $I_E = 10 \mu\text{Adc}$		$V_{(BR)EB0}$	6.0	Vdc

NJ Semi-Conductors reserves the right to change test conditions, parameters limits and package dimensions without notice information furnished by NJ Semi-Conductors is believed to be both accurate and reliable at the time of going to press. However NJ Semi-Conductors assumes no responsibility for any errors or omissions discovered in its use. NJ Semi-Conductors encourages customers to verify that datasheets are current before placing orders.

Quality Semi-Conductors



ELECTRICAL CHARACTERISTICS (con't)

Characteristics	Symbol	Min.	Max.	Unit
Collector-Emitter Cutoff Current $V_{CE} = 200 \text{ Vdc}$ $V_{CE} = 300 \text{ Vdc}$	I_{CES}		0.2	$\mu\text{A dc}$
2N5660, 2N5662 2N5661, 2N5663			0.2	$\mu\text{A dc}$
Collector-Base Cutoff Current $V_{CB} = 200 \text{ Vdc}$ $V_{CB} = 250 \text{ Vdc}$ $V_{CB} = 300 \text{ Vdc}$ $V_{CB} = 400 \text{ Vdc}$	I_{CBO}		0.1	$\mu\text{A dc}$
2N5660, 2N5662			1.0	mA dc
2N5660, 2N5662			0.1	$\mu\text{A dc}$
2N5661, 2N5663 2N5661, 2N5663			1.0	mA dc

ON CHARACTERISTICS ⁽⁵⁾

Forward-Current Transfer Ratio $I_C = 50 \text{ mA dc}$, $V_{CE} = 2.0 \text{ Vdc}$ $I_C = 0.5 \text{ A dc}$, $V_{CE} = 5.0 \text{ Vdc}$ $I_C = 1.0 \text{ A dc}$, $V_{CE} = 5.0 \text{ Vdc}$ $I_C = 2.0 \text{ A dc}$, $V_{CE} = 5.0 \text{ Vdc}$	h_{FE}	2N5660, 2N5662 2N5661, 2N5663	40 25		
2N5660, 2N5662 2N5661, 2N5663		40 25	120 75		
All Types		15			
All Types		5.0			
Collector-Emitter Saturation Voltage $I_C = 1.0 \text{ A dc}$, $I_B = 0.1 \text{ A dc}$ $I_C = 2.0 \text{ A dc}$, $I_B = 0.4 \text{ A dc}$	$V_{CE(sat)}$		0.4 0.8		Vdc
Base-Emitter Saturation Voltage $I_C = 1.0 \text{ A dc}$, $I_B = 0.1 \text{ A dc}$ $I_C = 2.0 \text{ A dc}$, $I_B = 0.4 \text{ A dc}$	$V_{BE(sat)}$		1.2 1.5		Vdc

DYNAMIC CHARACTERISTICS

Magnitude of Common Emitter Small-Signal Short-Circuit Forward Current Transfer Ratio $I_C = 0.1 \text{ A dc}$, $V_{CE} = 5.0 \text{ Vdc}$, $f = 10 \text{ MHz}$	$ 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_{obe}		45		pF

SWITCHING CHARACTERISTICS

Turn-On Time $V_{CC} = 100 \text{ Vdc}$; $I_C = 0.5 \text{ A dc}$; $I_{B1} = 15 \text{ A dc}$ $V_{CC} = 100 \text{ Vdc}$; $I_C = 0.5 \text{ A dc}$; $I_{B1} = 25 \text{ A dc}$	t_{on}	2N5660, 2N5662 2N5661, 2N5663		0.25 0.25	μs
Turn-Off Time $V_{CC} = 100 \text{ Vdc}$; $I_C = 0.5 \text{ A dc}$; $I_{B1} = -I_{B2} = 15 \text{ A dc}$ $V_{CC} = 100 \text{ Vdc}$; $I_C = 0.5 \text{ A dc}$; $I_{B1} = -I_{B2} = 25 \text{ A dc}$		t_{off}	2N5660, 2N5662 2N5661, 2N5663		0.85 1.2

SAFE OPERATING AREA

DC Tests					
$T_C = +100^\circ\text{C}$, 1 Cycle, $t \geq 1.0 \text{ s}$					
Test 1					
$V_{CE} = 10 \text{ Vdc}$, $I_C = 2.0 \text{ A dc}$	2N5660, 2N5661				
$V_{CE} = 7.5 \text{ Vdc}$, $I_C = 2.0 \text{ A dc}$	2N5662, 2N5663				
Test 2					
$V_{CE} = 40 \text{ Vdc}$, $I_C = 500 \text{ mA dc}$	2N5660, 2N5661				
$V_{CE} = 25 \text{ Vdc}$, $I_C = 600 \text{ mA dc}$	2N5662, 2N5663				
Test 3					
$V_{CE} = 200 \text{ Vdc}$, $I_C = 36 \text{ mA dc}$	2N5660				
$V_{CE} = 200 \text{ Vdc}$, $I_C = 27 \text{ mA dc}$	2N5662				
Test 4					
$V_{CE} = 300 \text{ Vdc}$, $I_C = 19 \text{ mA dc}$	2N5661				
$V_{CE} = 300 \text{ Vdc}$, $I_C = 14 \text{ mA dc}$	2N5663				