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NPN POWER SILICON TRANSISTOR

2N5660 2N5661 2N5662 2N5663

MAXIMUM RATINGS

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

THERMAL CHARACTERISTICS

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

1) Derate linearly 11.4 mW/°C for T_A > +25°C
2) Derate linearly 5.7 mW/°C for T_A > +25°C
3) Derate linearly 200 mW/°C for T_C > +100°C
4) Derate linearly 150 mW/°C for T_C > +100°C

TO-66*

2N5660, 2N5661

TO-5*
2N5662, 2N5663

*See appendix A for package outline

ELECTRICAL CHARACTERISTICS (T_C = 25°C unless otherwise noted)

Characteristics		Symbol	Min.	Max.	Unit
OFF CHARACTERISTICS					
Collector-Emitter Breakdown Voltage I_C = 10 mAdc	2N5660, 2N5662 2N5661, 2N5663	$V_{(BR)CEO}$	200 300		Vdc
Collector-Base Breakdown Voltage I_C = 10 mAdc, R_{BE} = 100Ω	2N5660, 2N5662 2N5661, 2N5663	$V_{(BR)CER}$	250 400		Vdc
Emitter-Base Breakdown Voltage I_E = 10 μAdc		$V_{(BR)EBO}$	6.0		Vdc

ELECTRICAL CHARACTERISTICS (con't)

Characteristics		Symbol	Min.	Max.	Unit
Collector-Emitter Cutoff Current					
V_{CE} = 200 Vdc	2N5660, 2N5662	I_{CES}		0.2	μAdc
V_{CE} = 300 Vdc	2N5661, 2N5663			0.2	μAdc
Collector-Base Cutoff Current					
V_{CB} = 200 Vdc	2N5660, 2N5662			0.1	μAdc
V_{CB} = 250 Vdc	2N5660, 2N5662	I_{CBO}		1.0	mAdc
V_{CB} = 300 Vdc	2N5661, 2N5663			0.1	μAdc
V_{CB} = 400 Vdc	2N5661, 2N5663			1.0	mAdc
ON CHARACTERISTICS [5]					
Forward-Current Transfer Ratio					
I_C = 50 mAdc, V_{CE} = 2.0 Vdc	2N5660, 2N5662		40		
	2N5661, 2N5663		25		
I_C = 0.5 Adc, V_{CE} = 5.0 Vdc	2N5660, 2N5662	h_{FE}	40	120	
	2N5661, 2N5663		25	75	
I_C = 1.0 Adc, V_{CE} = 5.0 Vdc	All Types		15		
I_C = 2.0 Adc, V_{CE} = 5.0 Vdc	All Types		5.0		
Collector-Emitter Saturation Voltage					
I_C = 1.0 Adc, I_B = 0.1 Adc		$V_{CE(sat)}$		0.4	Vdc
I_C = 2.0 Adc, I_B = 0.4 Adc				0.8	
Base-Emitter Saturation Voltage					
I_C = 1.0 Adc, I_B = 0.1 Adc		$V_{BE(sat)}$		1.2	Vdc
I_C = 2.0 Adc, I_B = 0.4 Adc				1.5	
DYNAMIC CHARACTERISTICS					
Magnitude of Common Emitter Small-Signal Short-Circuit Forward Current Transfer Ratio		$\lvert h_{fe} \rvert$	2.0	7.0	
I_C = 0.1 Adc, V_{CE} = 5.0 Vdc, f = 10 MHz					
Output Capacitance		C_{obo}		45	pF
V_{CB} = 10 Vdc, I_E = 0, 100 kHz ≤ f ≤ 1.0 MHz					
SWITCHING CHARACTERISTICS					
Turn-On Time					
V_{CC} = 100 Vdc; I_C = 0.5 Adc; I_{B1} = 15 Adc	2N5660, 2N5662	t_{on}		0.25	μs
V_{CC} = 100 Vdc; I_C = 0.5 Adc; I_{B1} = 25 Adc	2N5661, 2N5663			0.25	
Turn-Off Time					
V_{CC} = 100 Vdc; I_C = 0.5 Adc; I_{B1} = $-I_{B2}$ = 15 Adc	2N5660, 2N5662	t_{off}		0.85	μs
V_{CC} = 100 Vdc; I_C = 0.5 Adc; I_{B1} = $-I_{B2}$ = 25 Adc	2N5661, 2N5663			1.2	

SAFE OPERATING AREA

DC Tests

T_C = +100°C, 1 Cycle, t ≥ 1.0 s

Test 1

V_{CE} = 10 Vdc, I_C = 2.0 Adc	2N5660, 2N5661
V_{CE} = 7.5 Vdc, I_C = 2.0 Adc	2N5662, 2N5663

Test 2

V_{CE} = 40 Vdc, I_C = 500 mAdc	2N5660, 2N5661
V_{CE} = 25 Vdc, I_C = 600 mAdc	2N5662, 2N5663

Test 3

V_{CE} = 200 Vdc, I_C = 36 mAdc	2N5660
V_{CE} = 200 Vdc, I_C = 27 mAdc	2N5662

Test 4

V_{CE} = 300 Vdc, I_C = 19 mAdc	2N5661
V_{CE} = 300 Vdc, I_C = 14 mAdc	2N5663