

## NPN MEDIUM POWER SILICON SWITCHING TRANSISTOR

Qualified per MIL-PRF-19500/99

### Devices

2N696  
2N696S

2N697  
2N697S

### Qualified Level

JAN

### MAXIMUM RATINGS

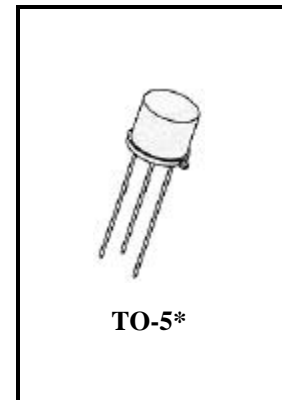
Ratings	Symbol	Value	Units
Collector-Base Voltage	$V_{CBO}$	60	Vdc
Emitter-Base Voltage	$V_{EBO}$	5.0	Vdc
Total Power Dissipation @ $T_A = 25^{\circ}\text{C}$ <sup>(1)</sup> @ $T_C = 25^{\circ}\text{C}$ <sup>(2)</sup>	$P_T$	0.6 2.0	W W
Operating & Storage Junction Temperature Range	$T_J, T_{stg}$	-65 to +200	$^{\circ}\text{C}$

### THERMAL CHARACTERISTICS

Characteristics	Symbol	Max.	Unit
Thermal Resistance, Junction-to-Case	$R_{\theta JC}$	0.075	$^{\circ}\text{C}/\text{mW}$

1) Derate linearly 4.0 mW/ $^{\circ}\text{C}$  for  $T_A > 25^{\circ}\text{C}$

2) Derate linearly 13.3 mW/ $^{\circ}\text{C}$  for  $T_C > 25^{\circ}\text{C}$



\*See appendix A for package outline

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

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

Collector-Emitter Breakdown Voltage $R_{BE} = 10 \Omega, I_C = 100 \text{ mAdc}$	$V_{(BR)CER}$	40		Vdc
Collector-Base Cutoff Current $V_{CB} = 100 \text{ Vdc}$ $V_{CB} = 30 \text{ Vdc}$	$I_{CBO}$		10 0.1	$\mu\text{Adc}$
Emitter-Base Cutoff Current $V_{EB} = 7.0 \text{ Vdc}$	$I_{EBO}$		10	$\mu\text{Adc}$

#### ON CHARACTERISTICS <sup>(3)</sup>

Forward-Current Transfer Ratio $I_C = 150 \text{ mAdc}, V_{CE} = 10 \text{ Vdc}$	2N696,s 2N697,s	$h_{FE}$	20 40	60 120	
$I_C = 500 \text{ mAdc}, V_{CE} = 10 \text{ Vdc}$	2N696,s 2N697,s		12.5 20.0		
Collector-Emitter Saturation Voltage $I_C = 150 \text{ mAdc}, I_B = 15 \text{ mAdc}$	$V_{CE(sat)}$	0.3	1.5	Vdc	
Base-Emitter Saturation Voltage $I_C = 150 \text{ mAdc}, I_B = 15 \text{ mAdc}$	$V_{BE(sat)}$		1.3	Vdc	

**2N696, 2N696s, 2N697, 2N697s SERIES**

**ELECTRICAL CHARACTERISTICS (con't)**

Characteristics	Symbol	Min.	Max.	Unit
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**DYNAMIC CHARACTERISTICS**

Magnitude of Common Emitter Small-Signal Short-Circuit Forward-Current Transfer Ratio $I_C = 50 \text{ mA dc}, V_{CE} = 10 \text{ V dc}; f = 20 \text{ MHz}$	$ h_{fe} $	2N696,s 2N697,s	2.5 3.0	10 12	
Output Capacitance $V_{CB} = 10 \text{ V dc}, I_E = 0, 100 \text{ kHz} \leq f \leq 1.0 \text{ MHz}$		$C_{obo}$	2.0	25	pF

**SWITCHING CHARACTERISTICS**

Turn-On Time (See Figure 3 of MIL-PRF-19500/ 99)	$t_{on}$		200	$\eta\text{s}$
Turn-Off Time (See Figure 4 of MIL-PRF-19500/99)	$t_{off}$		1,000	$\eta\text{s}$

(3) Pulse Test: Pulse Width 250 to 350 $\mu\text{s}$ , Duty Cycle  $\leq 2.0\%$ .

