

**TECHNICAL DATA**  
**DATA SHEET 4140, REV. -**

**SMALL SIGNAL TRANSISTOR**

**DESCRIPTION:** SINGLE PNP SMALL SIGNAL TRANSISTOR IN AN LCC-4 PACKAGE

**MAXIMUM RATINGS**

(ALL RATINGS ARE AT  $T_A = 25^\circ\text{C}$  UNLESS OTHERWISE SPECIFIED).

RATING	CONDITIONS	MIN.	TYP.	MAX.	UNITS
Collector-Emitter Voltage ( $V_{CE0}$ )	-	-	-	-175	Vdc
Collector-Base Voltage ( $V_{CBO}$ )	-	-	-	-175	Vdc
Emitter-Base Voltage ( $V_{EBO}$ )	-	-	-	-5.0	Vdc
Collector Current-Continuous ( $I_C$ )	-	-	-	-1	Adc
Total Power Dissipation $P_D$ @ $T_A = 25^\circ\text{C}$ Derate above $25^\circ\text{C}$	-	-	-	1 5.71	W mW/ $^\circ\text{C}$
Total Power Dissipation $P_D$ @ $T_C = 25^\circ\text{C}$ Derate above $25^\circ\text{C}$	-	-	-	5 28.6	W mW/ $^\circ\text{C}$
Thermal Resistance Junction to Case $R\theta_{JC}$	-	-	-	35	$^\circ\text{C}/\text{W}$
Operating Junction & Storage Temp ( $T_J$ & $T_{stg}$ )	-	-65	-	+200	$^\circ\text{C}$

**ELECTRICAL CHARACTERISTICS**

(ALL ELECTRICAL CHARACTERISTICS  $T_A = 25^\circ\text{C}$ )

OFF CHARACTERISTICS						
Collector-Emitter Breakdown Voltage $V_{(BR)CEO(1)}$	$I_C = -10\text{mAdc}, I_B = 0$	-175	-	-	-	Vdc
Collector-Base Breakdown Voltage $V_{(BR)CBO}$	$I_C = -10\mu\text{Adc}, I_E = 0$	-175	-	-	-	Vdc
Emitter-Base Breakdown Voltage $V_{(BR)EBO}$	$I_E = -10\mu\text{Adc}, I_C = 0$	-5.0	-	-	-	Vdc
Emitter Cutoff Current ( $I_{EBO}$ )	$V_{BE} = -3.0\text{V} \mid I_C = 0$	-	-	-50	-	nA
Collector Cutoff Current ( $I_{CBO}$ )	$V_{CB} = -100\text{V} \mid I_E = 0$	-	-	-100	-	nA
ON CHARACTERISTICS						
DC Current Gain ( $h_{FE}$ ) $V_{CE} = -10\text{Vdc}(1)$	$I_C = 0.1 \text{ mAdc}$	55	-	-	-	
	$I_C = 1 \text{ mAdc}$	90	-	-	-	
	$I_C = -10 \text{ mAdc}$	100	-	-	-	-
	$I_C = -50 \text{ mAdc}$	100	-	-	300	
	$I_C = -150 \text{ mAdc}$	60	-	-	-	
Collector-Emitter Saturation Voltage(1) $V_{CE(sat)}$	$(I_C = -10\text{mAdc}, I_B = -1\text{mAdc})$	-	-	-	-0.3	Vdc
	$(I_C = -50\text{mAdc}, I_B = -5\text{mAdc})$	-	-	-	-0.6	
Base-Emitter Saturation Voltage (1) $V_{BE(sat)}$	$(I_C = -10\text{mAdc}, I_B = -1\text{mAdc})$	-0.65	-	-	-0.8	Vdc
	$(I_C = -50\text{mAdc}, I_B = -5\text{mAdc})$	-	-	-	-0.9	

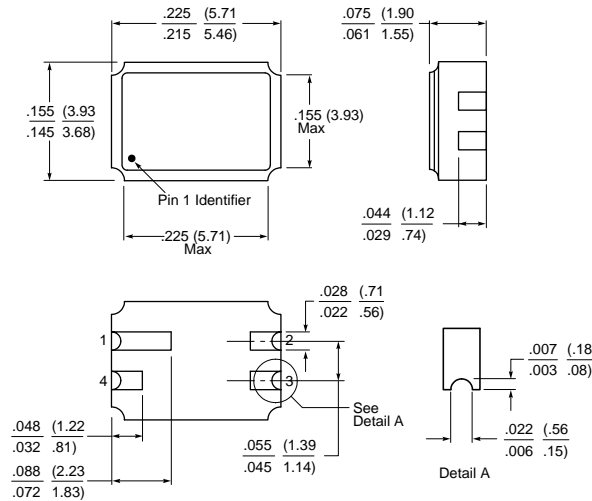
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DATASHEET 4140, REV. -**

RATING	CONDITIONS	MIN.	TYP.	MAX.	UNITS
<b>DYNAMIC CHARACTERISTICS</b>					
Current Gain, Bandwidth (2) (f <sub>T</sub> )	V <sub>CE</sub> = -30Vdc, I <sub>C</sub> = -30mAdc, f = 100MHz	200	-	-	MHz
Output Capacitance (C <sub>obo</sub> )	V <sub>CB</sub> = -20Vdc, I <sub>E</sub> = 0, 100 kHz < f < 1MHz	-	-	10	pF
Input Capacitance (C <sub>ibo</sub> )	V <sub>EB</sub> = -1.0 Vdc, I <sub>C</sub> = 0, 100 kHz < f < 1MHz	-	-	75	pF
<b>SMALL-SIGNAL CHARACTERISTICS</b>					
Delay Time (t <sub>d</sub> )	Conditions as in Mil-PRF-19500/357G	-		100	ns
Rise Time (t <sub>r</sub> )		-		100	
Turn-Off Time (t <sub>off</sub> )		-		600	
Storage Time (t <sub>s</sub> )		-		500	
Fall Time (t <sub>f</sub> )		-		150	

(1) Pulsed. Pulse Width ≤ 300 μs, Duty Cycle ≤ 2.0%.

(2) f<sub>T</sub> = |h<sub>fe</sub>| • f<sub>test</sub>

**MECHANICAL DIMENSIONS - in inches / mm**



**LCC-4**

**PIN ASSIGNMENTS**

DEVICE TYPE	PIN 1	PIN 2	PIN 3	PIN 4
PNP Transistor in a LCC-4 Package	COLLECTOR	EMITTER	BASE	N/C