

**2N3720**

**Silicon PNP  
 Power Transistors**

**APPLICATIONS:**

- High-Speed Switching
- Medium-Current Switching
- High-Frequency Amplifiers

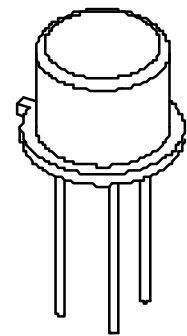
**FEATURES:**

- Collector-Emitter Sustaining Voltage:  
 $V_{CEO(SUS)} = 60 \text{ Vdc (Min) - 2N3720}$
- DC Current Gain:  
 $h_{FE} = 25-180 @ I_C = 1.0 \text{ Adc}$
- Low Collector-Emitter Saturation Voltage:  
 $V_{CE(sat)} = 0.75 \text{ Vdc @ } I_C = 1.0 \text{ Adc}$
- High Current-Gain - Bandwidth Product:  
 $f_T = 90 \text{ MHz (Typ)}$

**DESCRIPTION:**

These power transistors are produced by PPC's DOUBLE DIFFUSED PLANAR process. This technology produces high voltage devices with excellent switching speeds, frequency response, gain linearity, saturation voltages, high current gain, and safe operating areas. They are intended for use in Commercial, Industrial, and Military power switching, amplifier, and regulator applications.

Ultrasonically bonded leads and controlled die mount techniques are utilized to further increase the SOA capability and inherent reliability of these devices. The temperature range to 200°C permits reliable operation in high ambients, and the hermetically sealed package insures maximum reliability and long life.



**TO-5**

**ABSOLUTE MAXIMUM RATINGS:**

SYMBOL	CHARACTERISTIC	VALUE	UNITS
$V_{CEO}^*$	Collector-Emitter Voltage	60	Vdc
$V_{CB}^*$	Collector-Base Voltage	60	Vdc
$V_{EB}^*$	Emitter-Base Voltage	4.0	Vdc
$I_C^*$	Peak Collector Current	10	Adc
$I_C^*$	Continuous Collector Current	3.0	Adc
$I_B^*$	Base Current	0.5	Adc
$T_{STG}^*$	Storage Temperature	-65 to 200	°C
$T_J^*$	Operating Junction Temperature	-65 to 200	°C
$P_D^*$	Total Device Dissipation $T_C = 25^\circ\text{C}$	6.0	Watts
	Derate above 25°C	34.3	mW/°C
$P_D^*$	Total Device Dissipation $T_A = 25^\circ\text{C}$	1.0	Watts
	Derate above 25°C	5.71	mW/°C
$\theta_{JC}$	Thermal Resistance Junction to Case	29	°C/W
	Junction to Ambient	175	°C/W

\* Indicates JEDEC registered Data.

**ELECTRICAL CHARACTERISTICS:  
 (25°C Case Temperature Unless Otherwise Noted)**

SYMBOL	CHARACTERISTIC	TEST CONDITIONS	VALUE		Units
			Min.	Max.	
V <sub>CEO(sus)</sub> *	Collector-Emitter Sustaining Voltage	I <sub>C</sub> = 20 mAdc, I <sub>B</sub> = 0 (Note 1)	60	----	Vdc
I <sub>CEX</sub> *	Collector Cutoff Current	V <sub>CE</sub> = 60 Vdc, V <sub>BE(off)</sub> = 2.0 Vdc V <sub>CE</sub> = 60 Vdc, V <sub>BE(off)</sub> = 2.0 Vdc, T <sub>C</sub> = 150°C	----	10 1.0	μAdc mAdc
I <sub>CBO</sub> *	Collector Cutoff Current	V <sub>CB</sub> = 60 Vdc, I <sub>E</sub> = 0	----	10	μAdc
I <sub>EBO</sub> *	Emitter Cutoff Current	V <sub>BE</sub> = 4.0 Vdc, I <sub>C</sub> = 0	----	1.0	mAdc
h <sub>FE</sub> *	DC Current Gain (Note 1)	I <sub>C</sub> = 500 mAdc, V <sub>CE</sub> = 1.5 Vdc I <sub>C</sub> = 1.0 Adc, V <sub>CE</sub> = 1.5 Vdc I <sub>C</sub> = 1.0 Adc, V <sub>CE</sub> = 1.5 Vdc, T <sub>C</sub> = -40°C	20 25 15	---- 180 ----	---- ---- ----
V <sub>CE(sat)</sub> *	Collector-Emitter Saturation Voltage (Note 1)	I <sub>C</sub> = 1.0 Adc, I <sub>B</sub> = 100 mAdc, T <sub>C</sub> = -40°C to +100°C I <sub>C</sub> = 3.0 Adc, I <sub>B</sub> = 300 mAdc, T <sub>C</sub> = -40°C to +100°C	---- ----	0.75 1.5	Vdc Vdc
V <sub>BE(sat)</sub> *	Base-Emitter Saturation Voltage (Note 1)	I <sub>C</sub> = 1.0 Adc, I <sub>B</sub> = 100 mAdc, T <sub>C</sub> = -40°C to +100°C I <sub>C</sub> = 3.0 Adc, I <sub>B</sub> = 300 mAdc, T <sub>C</sub> = -40°C to +100°C	---- ----	1.5 2.3	Vdc Vdc
f <sub>T</sub> *	Current-Gain Bandwidth Product (Note 2)	I <sub>C</sub> = 500 mAdc, V <sub>CE</sub> = 10 Vdc, f <sub>test</sub> = 30 MHz	60	----	MHz
C <sub>ob</sub> *	Output Capacitance	V <sub>CB</sub> = 10 Vdc, I <sub>E</sub> = 0, f = 0.1 MHz	----	120	pF
C <sub>ib</sub> *	Input Capacitance	V <sub>EB</sub> = 0.5 Vdc, I <sub>C</sub> = 0, f = 0.1 MHz	----	1000	pF
t <sub>on</sub> *	Turn-on Time	V <sub>CC</sub> = 12 Vdc, V <sub>BE(off)</sub> = 0, I <sub>C</sub> = 1.0 Adc, I <sub>B1</sub> = 0.1 Adc	----	100	ns
t <sub>off</sub> *	Turn-off Time	V <sub>CC</sub> = 12 Vdc, I <sub>C</sub> = 1.0 Adc, I <sub>B1</sub> = I <sub>B2</sub> = 100 mAdc	----	400	ns

Note 1: Pulse Test: Pulse width ≤ 300μS, Duty Cycle = 2.0%.

Note 2: f<sub>T</sub> = | h<sub>fe</sub> | \* f<sub>test</sub>

\* Indicates JEDEC registered data

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**PACKAGE MECHANICAL DATA:**

