

2N6192 AND 2N6193

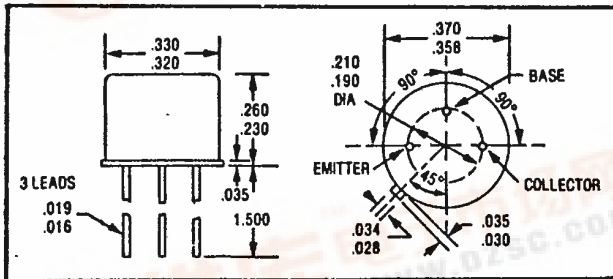
5 AMP

HIGH SPEED PNP TRANSISTOR

100 VOLTS

14830 Valley View Avenue
La Mirada, California 90638
(213) 921-9660
TWX 910-583-4807
FAX 213-921-2396

CASE STYLE W
JEDEC TO-5



FEATURES

- RADIATION TOLERANT
- FAST SWITCHING, 100 NSEC MAX t_d
- HIGH FREQUENCY, TYPICAL f_T 100 MZH
- V_{CE0} 100 VOLTS MIN
- HIGH LINEAR GAIN, LOW SATURATION VOLTAGE
- 200°C OPERATING, GOLD EUTECTIC DIE ATTACH
- DESIGNED FOR COMPLEMENTARY USE WITH 2N5338 AND 2N5339
- 2N6190 AND 2N6191 ALSO AVAILABLE

MAXIMUM RATINGS

Rating	Symbol	Value	Unit
Collector - Emitter Voltage	V_{CE0}	100	Volts
Collector - Base Voltage	V_{CB0}	100	Volts
Emitter - Base Voltage	V_{EB0}	6	Volts
Collector Current	I_C	5	Amps
Base Current	I_B	1	Amps
Total Device Dissipation @ $T_C = 25^\circ C$	P_D	10	Watts
Derate above $25^\circ C$		57.1	mW/°C
Operating and Storage Temperature	T_j, T_{stg}	-65 to +200	°C

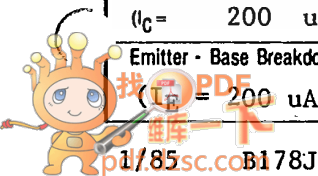
THERMAL CHARACTERISTICS

Characteristics	Symbol	Value	Unit
Thermal Resistance, Junction to Case	$R_{\theta JC}$	17.5	°C/W

ELECTRICAL CHARACTERISTICS

Characteristics	Symbol	Min.	Max.	Unit
Collector - Emitter Breakdown Voltage* ($I_C = 50$ mA)	BV_{CE0}	100	-	Vdc
Collector - Base Breakdown Voltage ($I_C = 200$ μ A)	BV_{CB0}	100	-	Vdc
Emitter - Base Breakdown Voltage ($I_E = 200$ μ A)	BV_{EB0}	6	-	Vdc

NOTE: All specifications subject to change without notice.

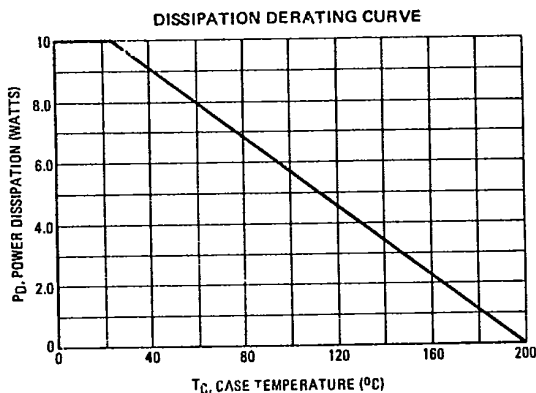


ELECTRICAL CHARACTERISTICS

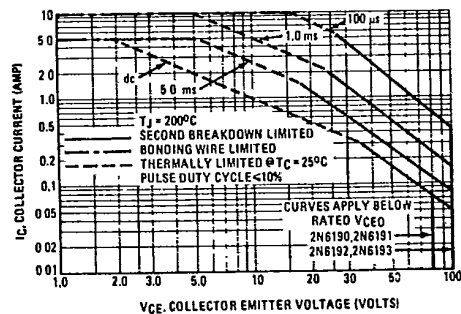
Characteristics	Symbol	Min.	Max.	Unit
Collector Cutoff Current (VCE = 90 Vdc) (VCE = 90 Vdc, VEB = 1.5 Vdc) (VCE = 90 Vdc, VEB = 1.5 Vdc, TC = 150°C)			100 10 1.0	uAdc uAdc mAdc
Collector Cutoff Current (VCB = 100 Vdc)	ICBO		10	u Adc
Emitter Cutoff Current (VEB = 6 Vdc)	IEBO		100	u Adc
DC Current Gain* (IC = 500 mAdc, VCE = 2 Vdc) (IC = 2 Adc, VCE = 2 Vdc) (IC = 5 Adc, VCE = 2 Vdc)	hFE*	30 60 30 60 20 40	120 240	
Collector - Emitter Saturation Voltage* (IC = 2 Adc, IB = 200 mAdc) (IC = 5 Adc, IB = 500 mAdc)	VCE (SAT)*		0.7 1.2	Vdc
Base - Emitter Saturation Voltage* (IC = 2 Adc, IB = 200 mAdc) (IC = 5 Adc, IB = 500 mAdc)	VBE (SAT)*		1.2 1.8	Vdc
Current - Gain - Bandwith Product (IC = 500 mAdc VCE = 10 Vdc, f = 10 MHz)	fT	30		M Hz
Output Capacitance (VCB = 10 Vdc, IE = 0, f = 100 KHz)	COB		300	pf
Input Capacitance (VBE = 2 Vdc, IC = 0, f = 100 KHz)	CIB		1250	pf
Delay Time (VCC = 40 Vdc, IC = 2.0 Adc, VEB(Off) = 3.0 Vdc, IB1 = IB2 = 200 mAdc)	td		100	ns
Rise Time	tr		100	ns
Storage Time	ts		2.0	us
Fall Time	tf		200	ns

*Pulse Test: Pulse width = 300 us, DutyCycle = 2%

TYPICAL OPERATING CURVES

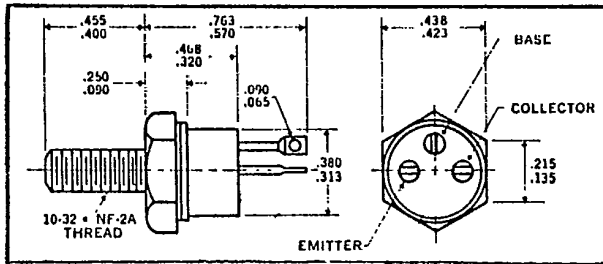


FORWARD BIAS DC SAFE OPERATION AREA (S.O.A.) CURVE
CURVES APPLY BELOW RATED VCEO TC = 25°C



<h1 style="margin: 0;">2N5003 AND 2N5005</h1> <h2 style="margin: 0;">5 AMP</h2> <h3 style="margin: 0;">HIGH SPEED PNP TRANSISTOR</h3> <h3 style="margin: 0;">100 VOLTS</h3>	
<p>14830 Valley View Avenue La Mirada, California 90638 (213) 921-9660 TWX 910-583-4807 FAX 213-921-2396</p>	

CASE STYLE X
JEDEC TO-59
ALL TERMINALS ISOLATED FROM CASE



FEATURES

- RADIATION TOLERANT
- FAST SWITCHING, TYPICAL 200 NSEC ton
- HIGH FREQUENCY, TYPICAL f_T 100 MHZ
- BVCEO 80 VOLTS MIN
- HIGH LINEAR GAIN, LOW SATURATION VOLTAGE
- 200°C OPERATING, GOLD EUTECTIC DIE ATTACH
- DESIGNED FOR COMPLEMENTARY USE WITH 2N5002 AND 2N5004

MAXIMUM RATINGS

Rating	Symbol	Value	Unit
Collector - Emitter Voltage	V_{CEO}	80	Volts
Collector - Base Voltage	V_{CBO}	100	Volts
Emitter - Base Voltage	V_{EBO}	6	Volts
Collector Current	I_C	5	Amps
Base Current	I_B	2	Amps
Total Device Dissipation @ TC = 50°C	P_D	50	Watts
Derate above 50 °C		333	mW/°C
Operating and Storage Temperature	T_j, T_{stg}	-65 to +200	°C

THERMAL CHARACTERISTICS

Characteristics	Symbol	Value	Unit
Thermal Resistance, Junction to Case	$R_{\theta JC}$	3.0	°C/W

ELECTRICAL CHARACTERISTICS

Characteristics	Symbol	Min.	Max.	Unit
Collector - Emitter Breakdown Voltage* ($I_C = 100$ mA dc)	BV_{CEO}^*	80		Vdc
Collector - Base Breakdown Voltage ($I_C = 200$ uA dc)	BV_{CBO}	100		Vdc
Emitter - Base Breakdown Voltage ($I_E = 200$ uA dc)	BV_{EBO}	6		Vdc

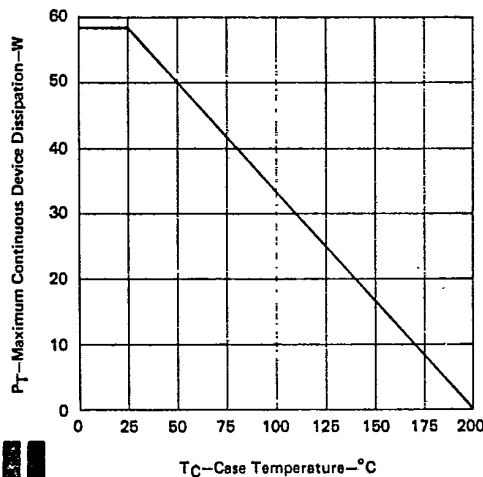
ELECTRICAL CHARACTERISTICS

Characteristics	Symbol	Min.	Max.	Unit
Collector Cutoff Current ($V_{CE} = 60 \text{ Vdc}$, $V_{BE} = 2 \text{ Vdc}$, $T_C = 150^\circ\text{C}$) ($V_{CE} = 40 \text{ Vdc}$)	I_{CEV} I_{CEO}		500 50	μAdc μAdc
Collector Cutoff Current ($V_{CE} = 60 \text{ Vdc}$) ($V_{CE} = 100 \text{ Vdc}$)	I_{CES}		1.0 1.0	μAdc mAdc
Emitter Cutoff Current ($V_{EB} = 5 \text{ Vdc}$) ($V_{EB} = 6 \text{ Vdc}$)	I_{EBO}		1.0 1.0	μAdc mAdc
DC Current Gain* ($I_C = 50 \text{ mAdc}$, $V_{CE} = 5 \text{ Vdc}$) ($I_C = 2.5 \text{ Adc}$, $V_{CE} = 5 \text{ Vdc}$) ($I_C = 5 \text{ Adc}$, $V_{CE} = 5 \text{ Vdc}$)	h_{FE}	20 50 30 70 20 40	90 200	
Collector - Emitter Saturation Voltage* ($I_C = 2.5 \text{ Adc}$, $I_B = 250 \text{ mAdc}$) ($I_C = 5 \text{ Adc}$, $I_B = 500 \text{ mAdc}$)	$V_{CE(SAT)}$		0.75 1.5	Vdc
Base - Emitter Saturation Voltage* ($I_C = 2.5 \text{ Adc}$, $I_B = 250 \text{ mAdc}$) ($I_C = 5 \text{ Adc}$, $I_B = 500 \text{ mAdc}$)	$V_{BE(SAT)}$		1.45 2.2	Vdc
Current - Gain - Bandwith Product ($I_C = 500 \text{ mAdc}$, $V_{CE} = 5 \text{ Vdc}$, $f = 20 \text{ MHz}$)	f_T	60 70		M Hz
Output Capacitance ($V_{CB} = 10 \text{ Vdc}$, $I_E = 0.1 = 1 \text{ MHz}$)	C_{ob}		250	pf
Base - Emitter Voltage* ($V_{CE} = 5 \text{ Vdc}$, $I_C = 2.5 \text{ Adc}$)	$V_{BE(ON)}$ *		1.45	Vdc
Delay Time ($V_{CC} = 30 \text{ Vdc}$, $I_C = 5 \text{ Adc}$, $V_{EB(Off)} = 3.7 \text{ Vdc}$, $I_{B1} = I_{B2} = 500 \text{ mAdc}$, $R_L = 6 \text{ Ohms}$)	t_d			
Rise Time	t_r		500	ns
Storage Time	t_s			
Fall Time	t_f		1.3	us

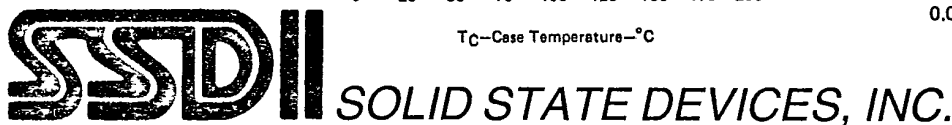
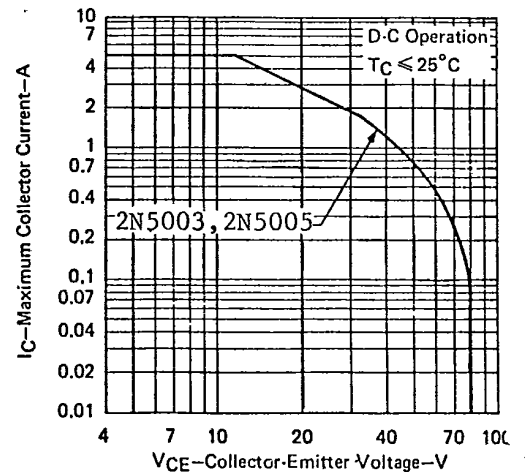
*Pulse Test: Pulse width = 300 us, DutyCycle = 2%

TYPICAL OPERATING CURVES

DISSIPATION DERATING CURVE



FORWARD BIAS DC SAFE OPERATION AREA (S.O.A. CURVE)
CURVES APPLY BELOW RATED V_{CEO} $T_C = 25^\circ\text{C}$



2N6188 AND 2N6189

10 AMP

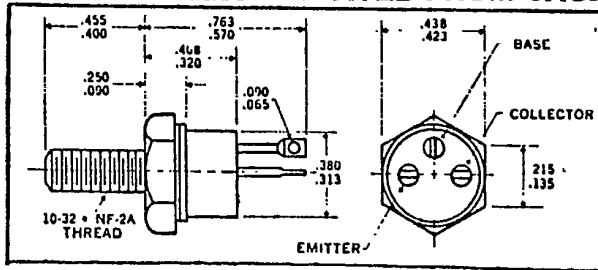
HIGH SPEED PNP TRANSISTOR

100 VOLTS



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CASE STYLE X JEDEC TO-59 ALL TERMINALS ISOLATED FROM CASE



FEATURES

- RADIATION TOLERANT
- FAST SWITCHING, 200 NSEC MAX t_{on}
- HIGH FREQUENCY, TYPICAL f_T 100 MHZ
- BVCEO 100 VOLTS MIN
- HIGH LINEAR GAIN, LOW SATURATION VOLTAGE
- 200°C OPERATING, GOLD EUTECTIC DIE ATTACH
- DESIGNED FOR COMPLEMENTARY USE WITH 2N5659

MAXIMUM RATINGS

Rating	Symbol	Value	Unit
Collector - Emitter Voltage	V_{CEO}	100	Volts
Collector - Base Voltage	V_{CBO}	100	Volts
Emitter - Base Voltage	V_{EBO}	6	Volts
Collector Current	I_C	10	Amps
Base Current	I_B	2	Amps
Total Device Dissipation @ $T_C = 25^\circ C$	P_D	60	Watts
Derate above 25 °C		343	mW/°C
Operating and Storage Temperature	T_j, T_{stg}	-65 to +200	°C

THERMAL CHARACTERISTICS

Characteristics	Symbol	Value	Unit
Thermal Resistance, Junction to Case	$R_{\theta JC}$	2.91	°C/W

ELECTRICAL CHARACTERISTICS

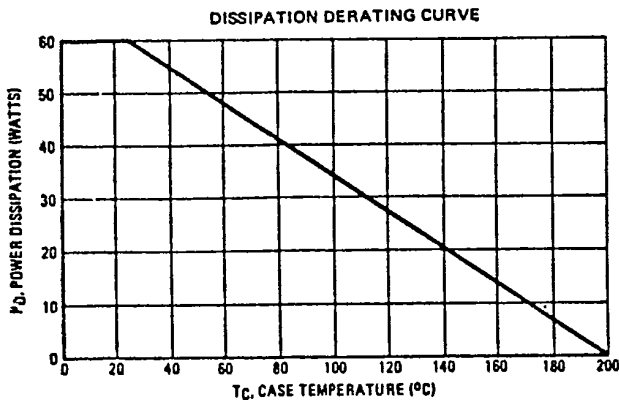
Characteristics	Symbol	Min.	Max.	Unit
Collector - Emitter Breakdown Voltage* ($I_C = 50$ mA dc)	BV_{CEO}	100		Vdc
Collector - Base Breakdown Voltage ($I_C = 200$ uA dc)	BV_{CBO}	100		Vdc
Emitter - Base Breakdown Voltage ($I_E = 200$ uA dc)	BV_{EBO}	6		Vdc

ELECTRICAL CHARACTERISTICS

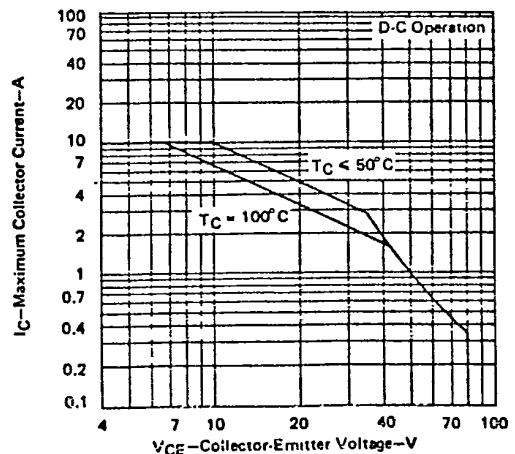
Characteristics	Symbol	Min.	Max.	Unit
Collector Cutoff Current ($V_{CE} = 90 \text{ Vdc}$) ($V_{CE} = 90 \text{ Vdc}, V_{BE} = 1.5 \text{ Vdc}$) ($V_{CE} = 90 \text{ Vdc}, V_{BE} = 1.5; -TC=150^{\circ}\text{C}$)	I_{CEO} I_{CEX}		100 10 1.0	μAdc μAdc mAdc
Collector Cutoff Current ($V_{CB} = 100 \text{ Vdc}$)	I_{CBO}		10	μAdc
Emitter Cutoff Current ($V_{EB} = 6 \text{ Vdc}$)	I_{EBO}		100	μAdc
DC Current Gain* ($I_C = 500 \text{ mAdc}, V_{CE} = 2 \text{ Vdc}$) ($I_C = 2 \text{ Adc}, V_{CE} = 2 \text{ Vdc}$) ($I_C = 2 \text{ Adc}, V_{CE} = 2 \text{ Vdc}$)	h_{FE}	30 60 30 60 20 40	120 240	
Collector - Emitter Saturation Voltage* ($I_C = 2 \text{ Adc}, I_B = 200 \text{ mAdc}$) ($I_C = 7 \text{ Adc}, I_B = 700 \text{ mAdc}$)	$V_{CE(SAT)}$		0.7 1.2	Vdc
Base - Emitter Saturation Voltage* ($I_C = 2 \text{ Adc}, I_B = 200 \text{ mAdc}$) ($I_C = 10 \text{ Adc}, I_B = 1 \text{ Adc}$)	$V_{BE(SAT)}$		1.2 2.0	Vdc
Current - Gain - Bandwith Product ($I_C = 500 \text{ mAdc}, V_{CE} = 10 \text{ Vdc}, f = 10 \text{ MHz}$)	f_T	30		MHz
Output Capacitance ($V_{CB} = 10 \text{ Vdc}, I_E = 0, f = 100 \text{ KHz}$)	C_{ob}		300	pf
Input Capacitance ($V_{BE} = 2 \text{ Vdc}, I_C = 0, f = 100 \text{ KHz}$)	C_{ib}		1250	pf
Delay Time ($V_{CC} = 40 \text{ Vdc}$)	t_d		100	n s
Rise Time ($V_{EB(Off)} = 3.0 \text{ Vdc}$)	t_r		100	n s
Storage Time ($I_C = 2 \text{ Adc}$)	t_s		2.0	μs
Fall Time ($I_{B1} = I_{B2} = 200 \text{ mAdc}$)	t_f		200	n s

*Pulse Test: Pulse width = 300 us, DutyCycle = 2%

TYPICAL OPERATING CURVES



FORWARD BIAS DC SAFE OPERATION AREA (S.O.A. CURVE)
CURVES APPLY BELOW RATED V_{CEO} $T_C = 25^{\circ}\text{C}$



SOLID STATE DEVICES, INC.