

2N5659

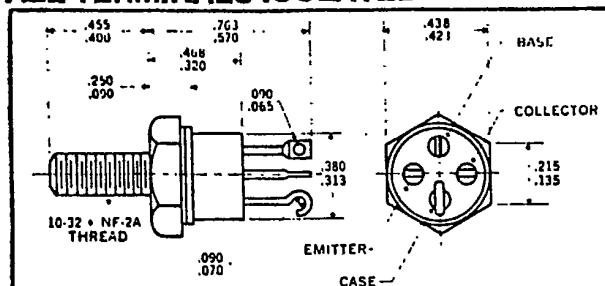
10 AMP

HIGH SPEED NPN TRANSISTOR

120 VOLTS



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

CASE STYLE Z**JEDEC TO-111****ALL TERMINALS ISOLATED FROM CASE****FEATURES**

- RADIATION TOLERANT
- FAST SWITCHING, 150 NSEC MAX t_{on}
- 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 2N6188 AND 2N6189

MAXIMUM RATINGS

Rating	Symbol	Value	Unit
Collector - Emitter Voltage	V_{CE0}	80	Volts
Collector - Base Voltage	V_{CB0}	120	Volts
Emitter - Base Voltage	V_{EB0}	7	Volts
Collector Current	I_C	10	Amps
Base Current	I_B	2	Amps
Total Device Dissipation @ $T_C = 100^\circ\text{C}$	P_D	30	Watts
Derate above 100 °C		300	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	$R_{\theta JC}$	3.33	°C/W

ELECTRICAL CHARACTERISTICS

Characteristics	Symbol	Min.	Max.	Unit
Collector - Emitter Breakdown Voltage* ($I_C = 100$ mA dc)	BV_{CE0}	80		Vdc
($I_C = 100$ mA dc, $R_{BE} = 10$ ohms)	BV_{CE0}	120		Vdc
Collector - Base Breakdown Voltage ($I_C = 200$ uA dc)	BV_{CB0}	120		Vdc
Emitter - Base Breakdown Voltage ($I_E = 200$ uA dc)	BV_{EB0}	7		Vdc

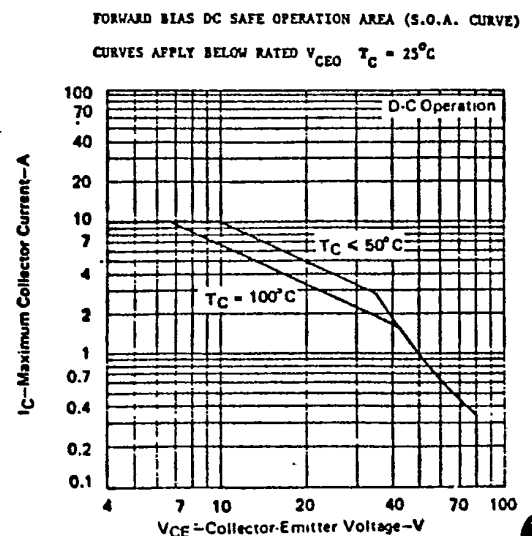
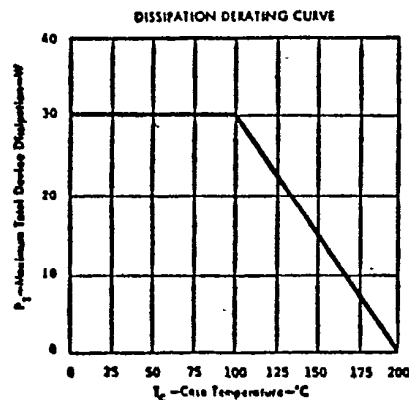
SOLID STATE DEVICES INC **T-33-09**
ELECTRICAL CHARACTERISTICS

12E D 8366011 0002082 T

Characteristics	Symbol	Min.	Max.	Unit
Collector Cutoff Current ($V_{CE} = 120 \text{ Vdc}$)	I_{CES}		200	nAdc
Collector Cutoff Current ($V_{CE} = 80 \text{ Vdc}$, $T_C = 150^\circ\text{C}$)	I_{CES}		100	uAdc
Emitter Cutoff Current ($V_{EB} = 7 \text{ Vdc}$)	I_{EBO}		10	uAdc
DC Current Gain* ($I_C = 500 \text{ mAdc}$, $V_{CE} = 2 \text{ Vdc}$) ($I_C = 5 \text{ Adc}$, $V_{CE} = 5 \text{ Vdc}$) ($I_C = 10 \text{ Adc}$, $V_{CE} = 5 \text{ Vdc}$)	h_{FE}	40 50 30	250 150	
Collector - Emitter Saturation Voltage* ($I_C = 5 \text{ Adc}$, $I_B = 500 \text{ mAdc}$) ($I_C = 10 \text{ Adc}$, $I_B = 1 \text{ Adc}$)	$V_{CE(SAT)}$		0.5 1.0	Vdc
Base - Emitter Saturation Voltage* ($I_C = 5 \text{ Adc}$, $I_B = 500 \text{ mAdc}$) ($I_C = 10 \text{ Adc}$, $I_B = 1 \text{ Adc}$)	$V_{BE(SAT)}$		1.3 1.8	Vdc
Current - Gain - Bandwidth Product ($I_C = 500 \text{ mAdc}$, $V_{CE} = 5 \text{ Vdc}$, $f = 10 \text{ MHz}$)	f_T	30		M Hz
Output Capacitance ($V_{CB} = 10 \text{ Vdc}$, $I_E = 0$, $f = 1 \text{ MHz}$)	C_{ob}		150	pF
Delay Time ($V_{CC} = 25 \text{ Vdc}$, $I_C = 5 \text{ Adc}$, $I_{B1} = I_{B2} = 250 \text{ mAdc}$, Base - Emitter clamp diode= 1N5802 or equivalent)	t_d t_r + t_s + t_f +		150	ns
Rise Time				
Storage Time				
Fall Time			800	ns

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

TYPICAL OPERATING CURVES



SSD SOLID STATE DEVICES, INC.

2N5006 AND 2N5008

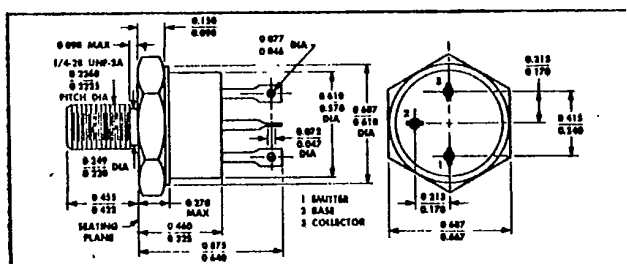
10 AMP

HIGH SPEED NPN TRANSISTOR

100 VOLTS



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

CASE STYLE T**JEDEC TO-61****ALL TERMINALS ISOLATED FROM CASE****FEATURES**

- RADIATION TOLERANT
- FAST SWITCHING, 100 NSEC MAX t_d
- HIGH FREQUENCY, TYPICAL f_T 100 MHZ
- V_{CE0} 80 VOLTS MIN
- HIGH LINEAR GAIN, LOW SATURATION VOLTAGE
- 200 °C OPERATING, GOLD EUTECTIC DIE ATTACH
- DESIGNED FOR COMPLEMENTARY USE WITH 2N5007 AND 2N5009

MAXIMUM RATINGS

Rating	Symbol	Value	Unit
Collector - Emitter Voltage	V_{CE0}	80	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	3	Amps
Total Device Dissipation @ $T_C = 50^\circ\text{C}$	P_D	100	Watts
Derate above 50 °C		667	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	$R_{\theta JC}$	1.5	°C/W

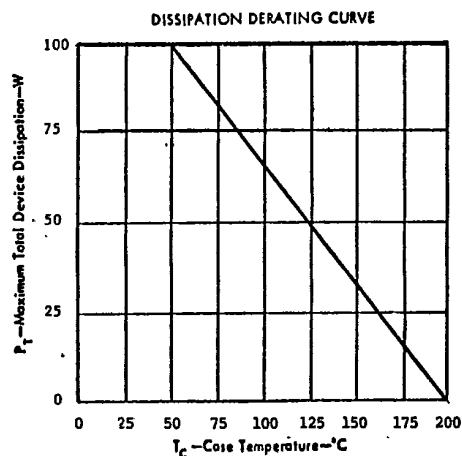
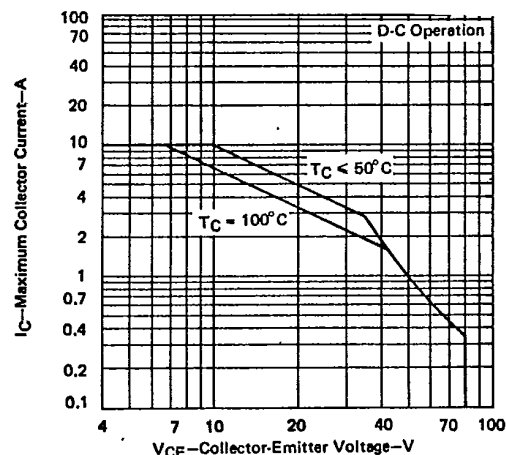
ELECTRICAL CHARACTERISTICS

Characteristics	Symbol	Min.	Max.	Unit
Collector - Emitter Breakdown Voltage* ($I_C = 200$ mA dc)	BV_{CE0}^*	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

Characteristics	Symbol	Min.	Max.	Unit
Collector Cutoff Current ($V_{CE} = 40 \text{ Vdc}$)	I_{CEO}		50	μAdc
($V_{CE} = 60 \text{ Vdc}$)	I_{CES}		1.0	μAdc
Collector Cutoff Current ($V_{CE} = 100 \text{ Vdc}$)	I_{CEX}		1.0	mAdc
($V_{CE} = 60 \text{ Vdc}$, $V_{BE} = 2 \text{ Vdc}$, $T_C = 150^\circ\text{C}$)	I_{CEX}		500	μAdc
Emitter Cutoff Current ($V_{EB} = 4 \text{ Vdc}$)	I_{EBO}		1.0	μAdc
($V_{EB} = 5.5 \text{ Vdc}$)			1.0	mAdc
DC Current Gain*				
($I_C = 100 \text{ mAdc}$, $V_{CE} = 5 \text{ Vdc}$)	h_{FE}	20		
($I_C = 5 \text{ Adc}$, $V_{CE} = 5 \text{ Vdc}$)		50		
($I_C = 10 \text{ Adc}$, $V_{CE} = 5 \text{ Vdc}$)		30		
		70	90	
		20	200	
		45		
Collector - Emitter Saturation Voltage*				
($I_C = 5 \text{ Adc}$, $I_B = 500 \text{ mAdc}$)	$V_{CE(SAT)}$		0.9	Vdc
($I_C = 10 \text{ Adc}$, $I_B = 500 \text{ mAdc}$)			1.5	
Base - Emitter Saturation Voltage*				
($I_C = 5 \text{ Adc}$, $I_B = 500 \text{ mAdc}$)	$V_{BE(SAT)}$		1.8	Vdc
($I_C = 10 \text{ Adc}$, $I_B = 1 \text{ Adc}$)			2.2	
Current - Gain - Bandwidth Product ($I_C = 500 \text{ mAdc}$, $V_{CE} = 5 \text{ Vdc}$, $f = 20 \text{ MHz}$)	f_T	35		MHz
		40		
Output Capacitance ($V_{CB} = 10 \text{ Vdc}$, $I_E = 0$, $f = 1 \text{ MHz}$)	C_{ob}		275	pF
Base - Emitter Voltage* ($V_{CE} = 5 \text{ Vdc}$, $I_C = 5 \text{ Adc}$)	$V_{BE(ON)}$		1.8	Vdc
Delay Time ($V_{CC} = 40 \text{ Vdc}$)	t_d		100	ns
Rise Time $V_{EB(off)} = 3.0 \text{ Vdc}$	t_r		100	ns
Storage Time $I_C = 2 \text{ Adc}$	t_s		2.0	μs
Fall Time $I_{B1} = I_{B2} = 200 \text{ mAdc}$	t_f		200	ns

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

TYPICAL OPERATING CURVES

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

SSD

SOLID STATE DEVICES, INC.

SFT6200

10 AMP

RADIATION TOLLERANT NPN TRANSISTOR

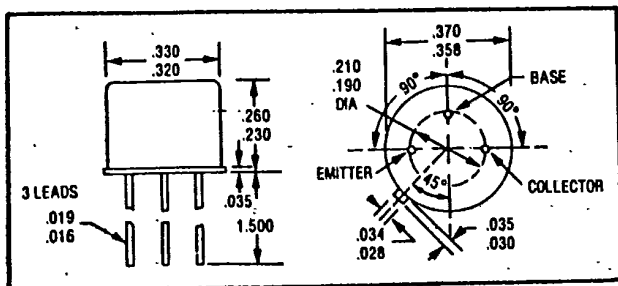
150 VOLTS

SSDII

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

- MIN h_{FE} OF 10 AT 1A, 10V. AFTER 1×10^{14} FAST NEUTRONS/ CM^2
- HIGH FREQUENCY, 150MHz TYPICAL
- ULTRA FAST, 150ns TYPICAL t_{on}
- V_{CEO} 80 VOLTS MIN
- HIGH LINEAR GAIN, VERY LOW SATURATION
- 200°C OPERATING TEMPERATURE
- GOLD EUTECTIC DIE ATTACH

MAXIMUM RATINGS

Rating	Symbol	Value	Unit
Collector - Emitter Voltage	V_{CEO}	80	Volts
$R_{BE} \sim 1K$ Ohms	V_{CER}	150	Volts
Collector - Base Voltage	V_{CBO}	150	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	10	Watts
Derate above $25^\circ C$		66.6	mW/ $^\circ C$
Operating and Storage Temperature	T_j, T_{stg}	-65 to 200	$^\circ C$

THERMAL CHARACTERISTICS

Characteristics	Symbol	Value	Unit
Thermal Resistance, Junction to Case	$R_{\theta JC}$	15	$^\circ C/W$

ELECTRICAL CHARACTERISTICS

Characteristics	Symbol	Min.	Max.	Unit
Collector - Emitter Breakdown Voltage* ($I_C = 10mA_{dc}$) ($I_C = 20\mu A_{dc}$, $R_{BE} = 1K\Omega$)	BV_{CEO} BV_{CER}	80 150		Vdc
Collector - Base Breakdown Voltage ($I_C = 20\mu A_{dc}$)	BV_{CBO}	150		Vdc
Emitter - Base Breakdown Voltage ($I_E = 20\mu A_{dc}$)	BV_{EBO}	6		Vdc

NOTE: All specifications subject to change without notice.

ELECTRICAL CHARACTERISTICS

Characteristics	Symbol	Min.	Max.	Unit
Collector Cutoff Current ($V_{CE} = 40 \text{ Vdc}$)	I_{CEO}		10	μA
Collector Cutoff Current ($V_{CB} = 100 \text{ Vdc}$)	I_{CBO}		10	μA
Emitter Cutoff Current ($V_{EB} = 4 \text{ Vdc}$)	I_{EBO}		1.0	μA
DC Current Gain* ($I_C = 500 \text{ mA}$, $V_{CE} = 10 \text{ Vdc}$) ($I_C = 1.0 \text{ A}$, $V_{CE} = 10 \text{ Vdc}$) ($I_C = 5.0 \text{ A}$, $V_{CE} = 5 \text{ Vdc}$)	h_{FE}	50 50 50	200	
Collector - Emitter Saturation Voltage* ($I_C = 5.0 \text{ A}$, $I_B = 500 \text{ mA}$)	$V_{CE(SAT)}$		0.5	Vdc
Base - Emitter Saturation Voltage* ($I_C = 5.0 \text{ A}$, $I_B = 500 \text{ mA}$)	$V_{BE(SAT)}$		1.2	Vdc
Current - Gain - Bandwidth Product ($I_C = 500 \text{ mA}$, $V_{CE} = 10 \text{ Vdc}$, $f = 1 \text{ MHz}$)	f_T	100		MHz
Output Capacitance ($V_{CB} = 10 \text{ Vdc}$, $f = 1 \text{ MHz}$)	C_{ob}		200	pf
Post Irradiation DC Current Gain* ($I_C = 1 \text{ A}$, $V_{CE} = 10 \text{ Vdc}$, $1 \times 10^{14} \text{ n/cm}^2$) (Fast Neutrons (n) at E = 10KeV Reactor Spectrum)	h_{FE}	10		
On Time ($V_{CC} = 30 \text{ Vdc}$, $I_C = 5.0 \text{ A}$)	t_{on}		200	ns
Off Time ($I_{B1} = I_{B2} = 500 \text{ mA}$)	t_{off}		800	ns

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

SOLID STATE DEVICES, INC.