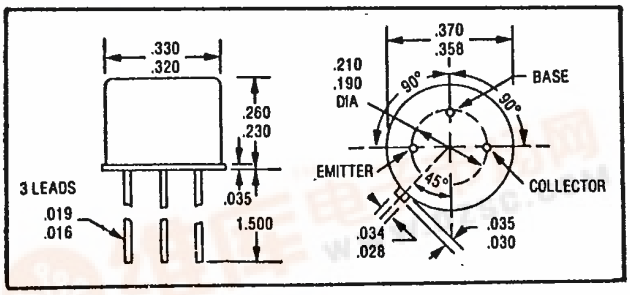
2N5338 AND 2N5339
5 AMP
HIGH SPEED NPN TRANSISTOR
100 VOLTS

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

CASE STYLE W
JEDEC TO-5



FEATURES

- RADIATION TOLERANT
- FAST SWITCHING, 100 NSEC MAX td
- 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 2N6192 AND 2N6193
- 2N5334 THRU 2N5337 ALSO AVAILABLE

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	5	Amps
Base Current	I_B	1	Amps
Total Device Dissipation @ TC = 25 °C	P_D	6	Watts
Derate above 25 °C		34.3	mW/°C
Operating and Storage Temperature	Tj, Tstg	-65 to +200	°C

THERMAL CHARACTERISTICS

Characteristics	Symbol	Value	Unit
Thermal Resistance, Junction to Case	RθJC	29.2	°C/W

ELECTRICAL CHARACTERISTICS

Characteristics	Symbol	Min.	Max.	Unit
Collector - Emitter Breakdown Voltage* (I_C = 50 m Adc)	BV_{CEO}*	100		Vdc
Collector - Base Breakdown Voltage (I_C = 200 u Adc)	BV_{CBO}	100		Vdc
Emitter - Base Breakdown Voltage (I_E = 200 uAdc)	BV_{EBO}	6		Vdc

NOTE: All specifications subject to change without notice.

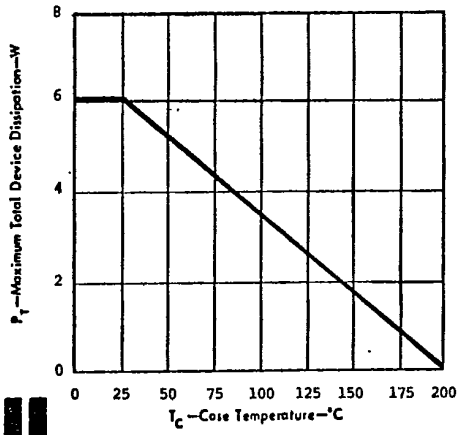
ELECTRICAL CHARACTERISTICS

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 (V_{CB} = 100 Vdc)		I_{CBO}		10	u Adc
Emitter Cutoff Current (V_{EB} = 6 Vdc)		I_{EBO}		100	u Adc
DC Current Gain*	2N5338 2N5339	h_{FE}*	30 60		
(I_C = 500 mAdc, V_{CE} = 2 Vdc)	2N5338		30	120	
(I_C = 2 Adc, V_{CE} = 2 Vdc)	2N5339		60	240	
(I_C = 5 Adc, V_{CE} = 2 Vdc)	2N5338 2N5339		20 40		
Collector - Emitter Saturation Voltage*					
(I_C = 2 Adc, I_B = 200 mAdc)		$V_{CE\ (SAT)}$*		0.7	Vdc
(I_C = 5 Adc, I_B = 500 mAdc)				1.2	
Base - Emitter Saturation Voltage*					
(I_C = 2 Adc, I_B = 200 mAdc)		$V_{BE\ (SAT)}$*		1.2	Vdc
(I_C = 5 Adc, I_B = 500 mAdc)				1.8	
Current - Gain - Bandwith Product (I_C = 500 mAdc V_{CE} = 10 Vdc, f = 10 M Hz)		f_T	30		M Hz
Output Capacitance (V_{CB} = 10 Vdc, I_E = 0, f = 100 KHz)		C_{ob}		250	pf
Input Capacitance (V_{BE} = 2 Vdc, I_C = 0, f = 100 KHz)		C_{ib}		1000	pf
Delay Time	(V_{CC} = 40 Vdc,	t_d		100	ns
Rise Time	I_C = 2.0 Adc,	t_r		100	ns
Storage Time	$V_{EB(Off)}$ = 3.0 Vdc,	t_s*		2.0	us
Fall Time	I_{B1} = I_{B2} = 200 mAdc)	t_f		200	ns

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

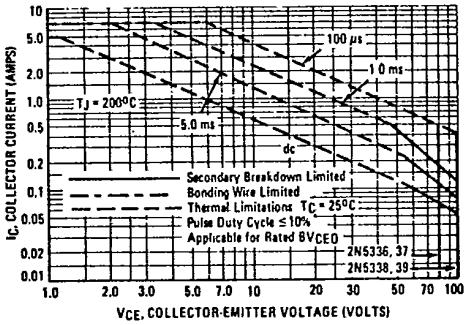
TYPICAL OPERATING CURVES

DISSIPATION DERATING CURVE



FORWARD BIAS DC SAFE OPERATION AREA (S.O.A. CURVE)

CURVES APPLY BELOW RATED V_{CEO} T_C = 25°C



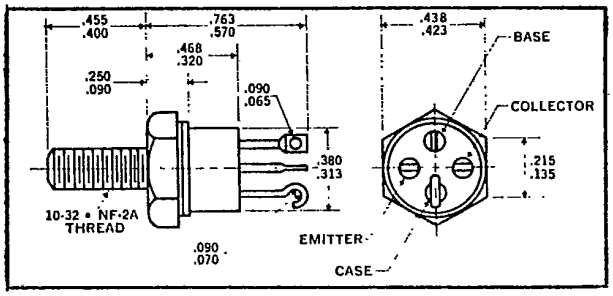
SOLID STATE DEVICES, INC.

P.O. Box 577, La Mirada, California 90637 Telephone: (213) 921-9660 • TWX 910-583-4807 • FAX#213-921-2396

2N3996 AND 2N3997
5 AMP
HIGH SPEED NPN TRANSISTOR
100 VOLTS

SSDI
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, 300 NSEC MAX 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 2N4999 AND 2N5001

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}	8	Volts
Collector Current	I_C	5	Amps
Base Current	I_B	1	Amps
Total Device Dissipation @ TC = 100°C Derate above 100 °C	P_D	30 300	Watts mW/°C
Operating and Storage Temperature	Tj, Tstg	-65 to +200	°C

THERMAL CHARACTERISTICS

Characteristics	Symbol	Value	Unit
Thermal Resistance, Junction to Case	RθJC	3.33	°C/W

ELECTRICAL CHARACTERISTICS

Characteristics	Symbol	Min.	Max.	Unit
Collector - Emitter Breakdown Voltage* (I_C = 50 mAdc)	BV_{CEO}*	80		Vdc
Collector - Base Breakdown Voltage (I_C = 200 uAdc)	BV_{CBO}	100		Vdc
Emitter - Base Breakdown Voltage (I_E = 200 uAdc)	BV_{EBO}	8		Vdc

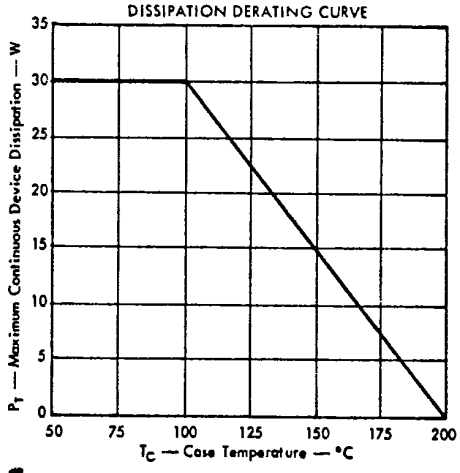
NOTE: All specifications subject to change without notice.

ELECTRICAL CHARACTERISTICS

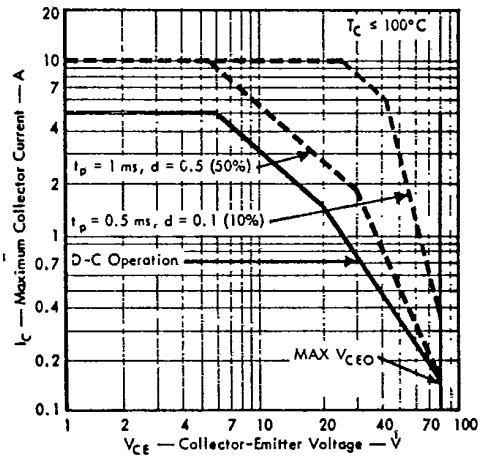
Characteristics		Symbol	Min.	Max.	Unit
Collector Cutoff Current (V_{CE} = 60 Vdc)		I_{CEO}		10	uAdc
Collector Cutoff Current (V_{CE} = 90 Vdc)		I_{CES}		5	uAdc
(V_{CE} = 90 Vdc, TC = 150°C)				50	uAdc
Emitter Cutoff Current (V_{EB} = 5 Vdc)		I_{EBO}		500	nAdc
(V_{EB} = 8 Vdc)				10	uAdc
DC Current Gain* (I_C = 50 mAdc, V_{CE} = 2 Vdc)	2N3996	h_{FE}*	30		
	2N3997		60		
(I_C = 1 Adc, V_{CE} = 2 Vdc)	2N3996		40	120	
	2N3997		80	240	
(I_C = 5 Adc, V_{CE} = 2 Vdc)	2N3996		15		
	2N3997		20		
Collector - Emitter Saturation Voltage* (I_C = 1 Adc, I_B = 100 mAdc)		$V_{CE(SAT)}$*		0.25	Vdc
(I_C = 5 Adc, I_B = 500 mAdc)				2.0	
Base - Emitter Saturation Voltage* (I_C = 1 Adc, I_B = 100 mAdc)		$V_{BE(SAT)}$*	0.6	1.2	Vdc
(I_C = 5 Adc, I_B = 500 mAdc)				1.6	
Current - Gain - Bandwith Product (I_C = 1 Adc V_{CE} = 5 Vdc, f = 10 MHz)		f_T	40		MHz
Output Capacitance (V_{CB} = 10 Vdc I_E = 0, f = 1 MHz)		C_{ob}		150	pf
Delay Time / Rise Time (V_{CC} = 20 Vdc, I_C = 1 Adc, $V_{EB(Off)}$ = 3.7 Vdc, I_{B1} = I_{B2} = 100 mAdc, R_L = 20 Ohms)	(t_{on})	t_d + t_r		300	ns
Storage Time / Fall Time	(t_{off})	t_s + t_f		1.5	us

*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°C



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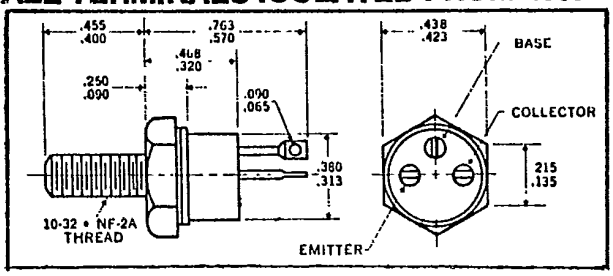
2N5002 AND 2N5004
5 AMP
HIGH SPEED NPN TRANSISTOR
100 VOLTS

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

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 2N5003 AND 2N5005

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	Tj, Tstg	-65 to +200	°C

THERMAL CHARACTERISTICS

Characteristics	Symbol	Value	Unit
Thermal Resistance, Junction to Case	RθJC	3.0	°C/W

ELECTRICAL CHARACTERISTICS

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

NOTE: All specifications subject to change without notice.

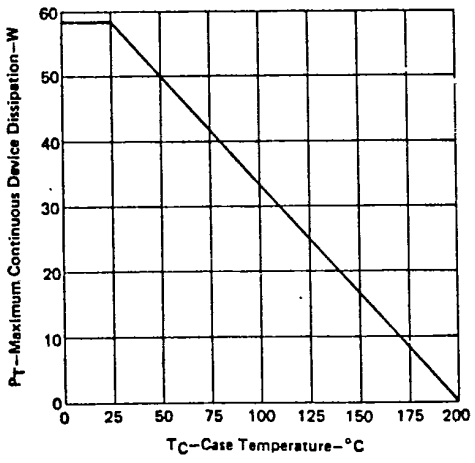
ELECTRICAL CHARACTERISTICS

Characteristics		Symbol	Min.	Max.	Unit
Collector Cutoff Current (VCE = 60 Vdc, VBE = 2 Vdc, TC = 150°C) (VCE = 40 Vdc)		I_{CEV} I_{CEO}		500 50	uAdc uAdc
Collector Cutoff Current (VCE = 60 Vdc) (VCE = 100 Vdc)		I_{CES}		1.0 1.0	uAdc mAdc
Emitter Cutoff Current (VEB = 5 Vdc) (VEB = 6 Vdc)		I_{EBO}		1.0 1.0	uAdc mAdc
DC Current Gain*	2N5002 2N5004	h_{FE}*	20 50		
(I_C = 50 mAdc, V_{CE} = 5 Vdc)	2N5002 2N5004		30 70	90 200	
(I_C = 2.5 Adc, V_{CE} = 5 Vdc)					
(I_C = 5 Adc, V_{CE} = 5 Vdc)	2N5002 2N5004		20 40		
Collector - Emitter Saturation Voltage* (I_C = 2.5 Adc, I_B = 250 mAdc) (I_C = 5 Adc, I_B = 500 mAdc)		$V_{CE(SAT)}$*		0.75 1.5	Vdc
Base - Emitter Saturation Voltage* (I_C = 2.5 Adc, I_B = 250 mAdc) (I_C = 5 Adc, I_B = 500 mAdc)		$V_{BE(SAT)}$*		1.45 2.2	Vdc
Current - Gain - Bandwith Product (I_C = 500 mAdc V_{CE} = 5 Vdc, f = 20 MHz)	2N5002 2N5004	f_T	60 70		M Hz
Output Capacitance (V_{CB} = 10 Vdc I_E = 0, f = 1 MHz)		C_{ob}		250	pf
Base - Emitter Voltage* (V_{CE} = 5 Vdc, I_C = 2.5 Adc)		$V_{BE(ON)}$*		1.45	Vdc
Delay Time Rise Time	(V_{CC} = 30 Vdc. I_C = 5 Adc. $V_{EB(Off)}$ = 3.7 Vdc, I_{B1} = I_{B2} = 500 mAdc, R_L = 6 Ohms) (t_{on})	t_d + t_r		500	ns
Storage Time Fall Time	(t_{off})	t_s + t_f		1.3	us

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

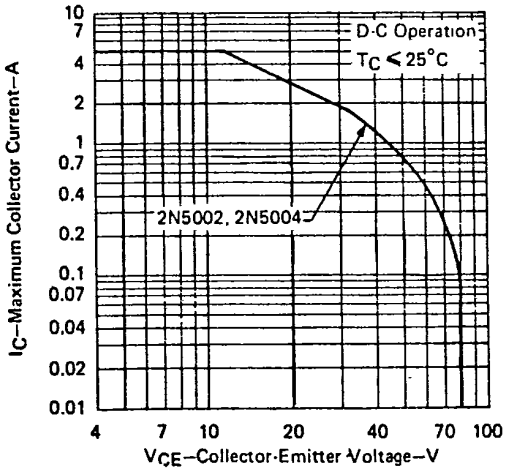
TYPICAL OPERATING CURVES

DISSIPATION DERATING CURVE



FORWARD BIAS DC SAFE OPERATION AREA (S.O.A. CURVE)

CURVES APPLY BELOW RATED V_{CEO} T_C = 25°C



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