Preliminary Data Sheet

T-33-09

SFT102

0.5 AMP

HIGH VOLTAGE NPN TRANSISTOR

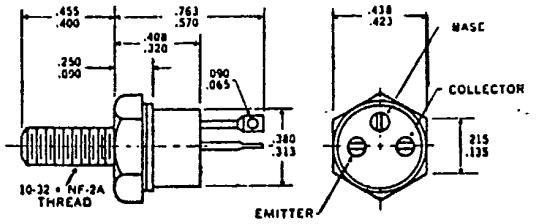
450 VOLTS

SSDI

14830 VALLEY VIEW
LA MIRADA, CA.90638
(213)921-9660
TWX 910-583-4807
FAX 213-921-2396

CASE STYLE TO-59

ALL TERMINALS ISOLATED FROM CASE



FEATURES

- BVCEO 350 VOLTS MIN.
- HIGH GAIN FROM 1mA TO 200mA
- VERY LOW LEAKAGE
- CHIP TO CASE CAPACITANCE LESS THAN 5pf
- 200 °C OPERATING TEMPERATURE
- GOLD EUTECTIC DIE ATTACH
- IDEAL FOR HIGH VOLTAGE VIDEO AMPLIFIERS
- FAST SWITCHING, ton = 500ns MAX.

MAXIMUM RATINGS

RATING	SYMBOL	VALUE	UNIT
Collector-Emitter Voltage	VCEO	350	Volts
Collector-Base Voltage	VCBO	450	Volts
Emitter-Base Voltage	VEBO	7.0	Volts
Collector Current	IC	0.5	Amps
Base Current	IB	0.1	Amps
Total Device Dissipation @ Tc = 25°C	PD	25	Watts
Derate Above 25°C		166	mW/°C
Operating and Storage Temperature	TJ,Tstg	-65 to +200	°C

THERMAL CHARACTERISTICS

CHARACTERISTIC	SYMBOL	VALUE	UNIT
Thermal Resistance, Junction to Case	RθJC	6.0	°C/W

ELECTRICAL CHARACTERISTICS

Characteristics	Symbol	Min	Max	Unit
Collector-Emitter Breakdown Voltage* (IC = 10mAdc)	BVCEO	350		Volts
Collector-Base Breakdown Voltage (IC = 10uAdc)	BVCBO	450		Volts

 Note: Specifications subject to change without notice.

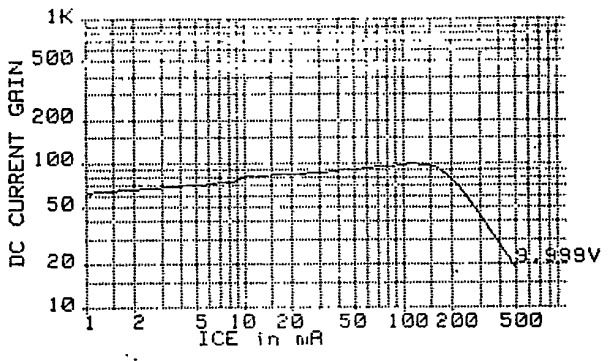
ELECTRICAL CHARACTERISTICS

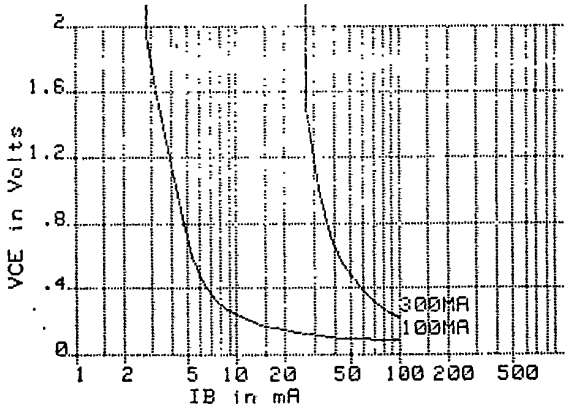
Characteristics	Symbol	Min	Max	Unit
Emitter-Base Breakdown Voltage (IE = 10uAdc)	BVEBO	7		Vdc
Collector Cutoff Current (VCE = 300Vdc)	ICEO		10	uAdc
Collector Cutoff Current (VCB = 400Vdc)	ICBO		1	uAdc
Emitter Cutoff Current (VEB = 6Vdc)	IEBO		500	nAdc
DC Current Gain* (IC = 100uAdc, VCE = 10Vdc) (IC = 10mAdc, VCE = 10Vdc) (IC = 300mAdc, VCE = 10Vdc)	hFE	50 70 30		
Collector-Emitter Saturation Voltage* (IC = 100mAdc, IB = 10mAdc) (IC = 300mAdc, IB = 30mAdc)	VCE(SAT)		0.4 1.5	Vdc
Base-Emitter Saturation Voltage* (IC = 100mAdc, IB = 10mAdc) (IC = 300mAdc, IB = 30mAdc)	VBE(SAT)		0.8 1.0	Vdc
Current Gain Bandwidth Product (IC = 10mAdc, VCE = 10Vdc, f = 10MHz)	fT	25		MHz
Output Capacitance (VCB = 10Vdc, IE = 0Adc, f = 1MHz)	Cob		20	pf
Input Capacitance (VBE = 0.5Vdc, IC = 0Adc, f = 1MHz)	Cib		150	pf
Turn On Time	ton		500	ns
Turn Off Time	toff		2.5	us

(VCC = 50Vdc, IC = 10mAdc, IB1 = IB2 = 5.0mAdc)

*Pulse Test: Pulse Width = 300us, Duty Cycle = 2%

TYPICAL OPERATING CURVES



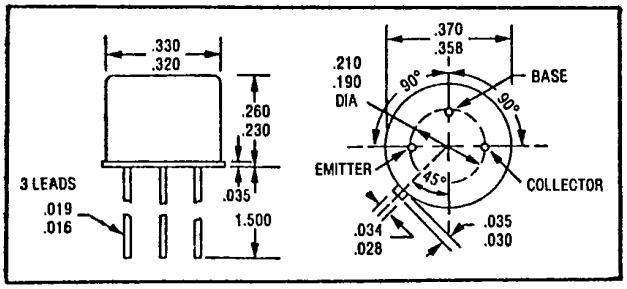


SSDI SOLID STATE DEVICES, INC.
P.O. Box 577, La Mirada, California 90637
Telephone (213) 921-9660 ♦ TWX 910-583-4807 ♦ FAX 213-921-2396

2N5013 THRU 2N5015
500 mA
HIGH VOLTAGE NPN TRANSISTOR
800—1000 VOLTS

SSDI
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

- BVCER AND BVCBO TO 1000 VOLTS
- LOW SATURATION VOLTAGE
- LOW LEAKAGE AT HIGH TEMPERATURE
- 200°C OPERATING, GOLD EUTECTIC DIE ATTACH
- 2N5010 THRU 2N5012 ALSO AVAILABLE

MAXIMUM RATINGS

Rating		Symbol	Value	Unit
Collector - Emitter Voltage, R_{BE} = 1K Ohms	2N5013	V_{CER}	800	Volts
	2N5014		900	
Collector - Base Voltage	2N5015	V_{CBO}	1000	
Emitter - Base Voltage		V_{EBO}	5	Volts
Collector Current		I_C	500	m Amps
Base Current		I_B	50	m Amps
Total Device Dissipation @ TC = 100°C		P_D	2	Watts
Derate above 100 °C			20	mW/°C
Operating and Storage Temperature		Tj, Tstg	-65 to +200	°C

THERMAL CHARACTERISTICS

Characteristics	Symbol	Value	Unit
Thermal Resistance, Junction to Case	RθJC	50	°C/W

ELECTRICAL CHARACTERISTICS

Characteristics		Symbol	Min.	Max.	Unit
Collector - Emitter Breakdown Voltage*	2N5013		800		Vdc
	2N5014		900		
(I_C = 200 u Adc, R_{BE} = 1 K ohms)	2N5015	BV_{CER}*	1000		
Collector - Base Breakdown Voltage	2N5013		800		Vdc
	2N5014		900		
(I_C = 200 u Adc)	2N5015	BV_{CBO}	1000		
Emitter - Base Breakdown Voltage (I_E = 50 uAdc)		BV_{EBO}	5		Vdc

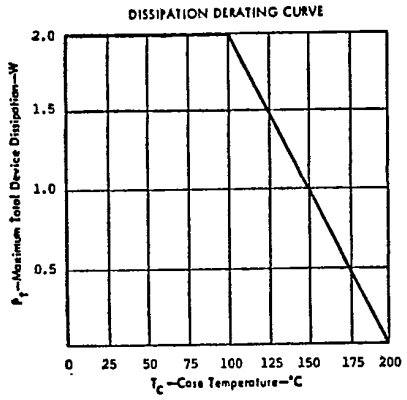
NOTE: All specifications subject to change without notice.

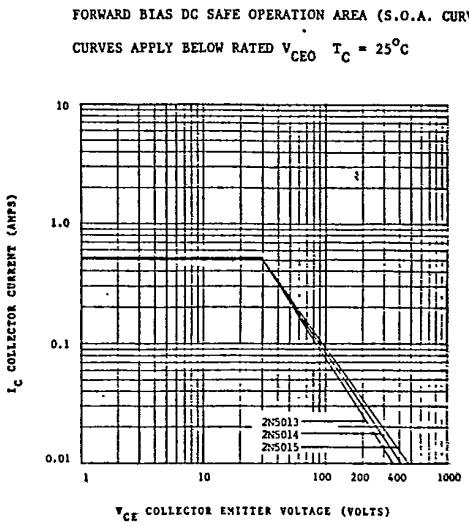
ELECTRICAL CHARACTERISTICS

Characteristics		Symbol	Min.	Max.	Unit
Collector Cutoff Current	(VCB = 650 Vdc) 2N5013 (VCB = 700 Vdc) 2N5014 (VCB = 750 Vdc) 2N5015	I_{CBO}		12**	uAdc
Collector Cutoff Current	(VCB = 650 Vdc, TA=100°C) 2N5013 (VCB = 700 Vdc, TA=100°C) 2N5014 (VCB = 750 Vdc, TA=100°C) 2N5015	I_{CBO}		100**	uAdc
DC Current Gain* (I_C = 5 mAdc, V_{CE} = 10 Vdc) (I_C = 20 mAdc, V_{CE} = 10 Vdc)		h_{FE}*	25 30	180	
Collector - Emitter Saturation Voltage* (I_C = 20 mAdc, I_B = 5 m Adc)	2N5013 2N5014 2N5015	$V_{CE\ (SAT)}$*		1.6 1.6 1.8	Vdc
Base - Emitter Saturation Voltage* (I_C = 20 mAdc, I_B = 5 m Adc)		$V_{BE\ (SAT)}$*		1.0	Vdc
Current - Gain - Bandwith Product (I_C = 20 mAdc, V_{CE} = 10 Vdc, f = 1 MHz)		f_T	25		MHz
Output Capacitance (V_{CB} = 10 Vdc, I_E = 0, f = 5 MHz)		C_{ob}		25	pf
Delay Time	(V_{CC} = 125 Vdc,	t_d		200	ns
Rise Time	I_C = 100 mAdc,	t_r		1200	ns
Storage Time		t_s*		3.0	us
Fall Time	$I_{B1} = I_{B2}$ = 10 mAdc)	t_f		800	ns

*Pulse Test: Pulse width = 300 us, DutyCycle = 2% **Typically 1 uA

TYPICAL OPERATING CURVES





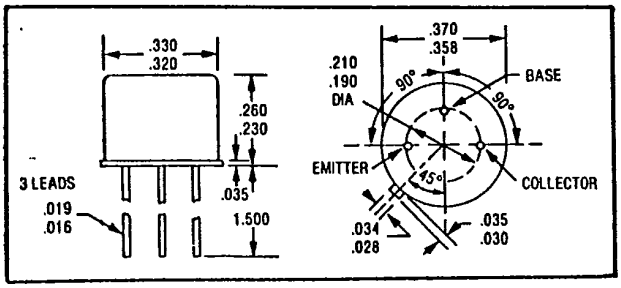
SSDI SOLID STATE DEVICES, INC.

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

2N5095 AND 2N5097
1 AMP
HIGH VOLTAGE NPN TRANSISTOR
500—600 VOLTS

SSDI
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

- BVCEO TO 450 VOLTS
- LOW SATURATION VOLTAGE
- VERY LOW LEAKAGE
- 200°C OPERATING, GOLD EUTECTIC DIE ATTACH
- DESIGNED FOR COMPLEMENTARY USE WITH 2N5094 AND 2N5096
- 2N5092 ALSO AVAILABLE

MAXIMUM RATINGS

Rating	Symbol	2N5095	2N5097	Unit
Collector - Emitter Voltage	V_{CEO}	400	450	Volts
R_{BE} = 1 K Ohms	V_{CER}	500	600	Volts
Collector - Base Voltage	V_{CBO}	500	600	Volts
Emitter - Base Voltage	V_{EBO}	6.0		Volts
Collector Current	I_C	1.0		Amps
Base Current	I_B	0.5		Amps
Total Device Dissipation @ TC = 100°C	P_D	2		Watts
Derate above 100 °C		20		mW/°C
Operating and Storage Temperature	Tj, Tstg	-65 to +200		°C

THERMAL CHARACTERISTICS

Characteristics	Symbol	Value	Unit
Thermal Resistance, Junction to Case	RθJC	50	°C/W

ELECTRICAL CHARACTERISTICS

Characteristics		Symbol	Min.	Max.	Unit
Collector - Emitter Breakdown Voltage* (I_C= 50 mAdc)	2N5095 2N5097	BV_{CEO}*	400 450		Vdc
(I_C= 100 uAdc, R_{BE}= 1K Ohms	2N5095 2N5097	BV_{CER}*	500 600		Vdc
Collector - Base Breakdown Voltage (I_C= 100 u Adc)	2N5095 2N5097	BV_{CBO}	500 600		Vdc
Emitter - Base Breakdown Voltage (I_E = 20 uAdc)		BV_{EBO}	6		Vdc

NOTE: All specifications subject to change without notice.

ELECTRICAL CHARACTERISTICS

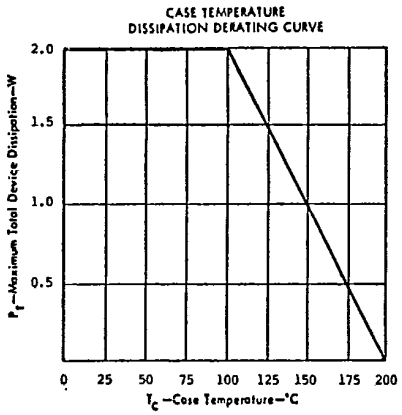
Characteristics	Symbol	Min.	Max.	Unit
Collector Cutoff Current 2N5095 V_{CB} = 400 Vdc 2N5097 V_{CB} = 500 Vdc	I_{CBO}		500	nAdc
Emitter Cutoff Current (V_{EB} = 4 Vdc)	I_{EBO}		250	nAdc
DC Current Gain* (I_C = 1 mAdc, V_{CE} = 10 Vdc) (I_C = 25 mAdc, V_{CE} = 5 Vdc) (I_C = 100 mAdc, V_{CE} = 5 Vdc)	h_{FE}*	25 50 15	250 300 250	
Collector - Emitter Saturation Voltage* (I_C = 25 m Adc, I_B = 2.5 mAdc)	$V_{CE\ (SAT)}$*		0.5	Vdc
Base - Emitter Voltage* (I_C = 25 mAdc, VCE = 5 Vdc)	$V_{BE(ON)}$*		1.0	Vdc
Current - Gain - Bandwith Product (I_C = 50 mAdc V_{CE} = 10 Vdc. f = 20 MHz)	f_T	25		MHz
Output Capacitance (V_{CB} = 15 Vdc. I_E = 0. f = 2 MHz)	C_{ob}		15	pf

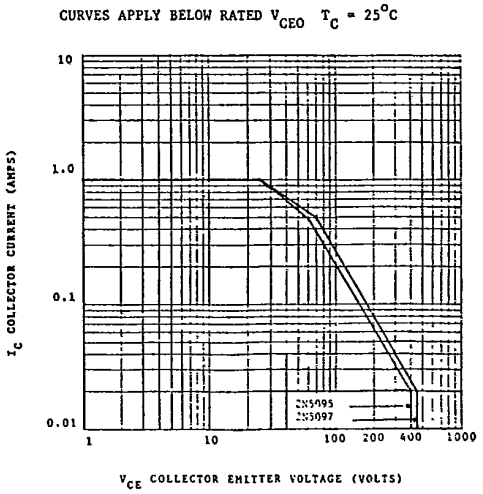
SWITCHING TIMES

Delay Time	(V_{CC} = 125 Vdc	t_d		200	ns
Rise Time	I_C= 100 mAdc,	t_r		1200	ns
Storage Time		t_s		3.0	us
Fall Time	I_{B1} = I_{B2} = 10 m Adc)	t_f		800	ns

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

TYPICAL OPERATING CURVES





SOLID STATE DEVICES, INC.
P. O. Box 577, La Mirada, California 90637
Telephone: (213) 921-9660 • TWX 910-583-4807