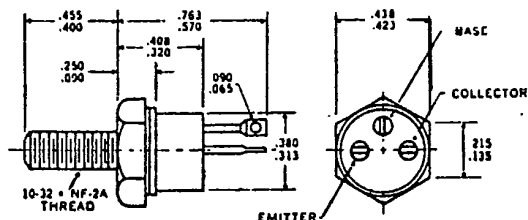


SFT102 0.5 AMP HIGH VOLTAGE NPN TRANSISTOR 450 VOLTS	SSDI 14830 VALLEY VIEW LA MIRADA, CA. 90638 (213) 921-9660 TWX 910-583-4807 FAX 213-921-2396
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CASE STYLE TO-59
ALL TERMINALS ISOLATED FROM CASE



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, $t_{on} = 500ns$ 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 @ $T_c = 25^\circ C$	PD	25	Watts
Derate Above $25^\circ C$		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

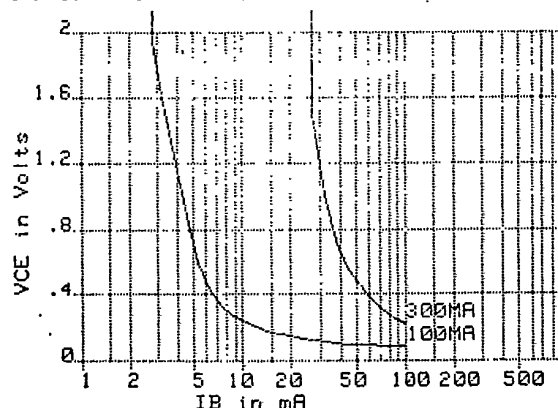
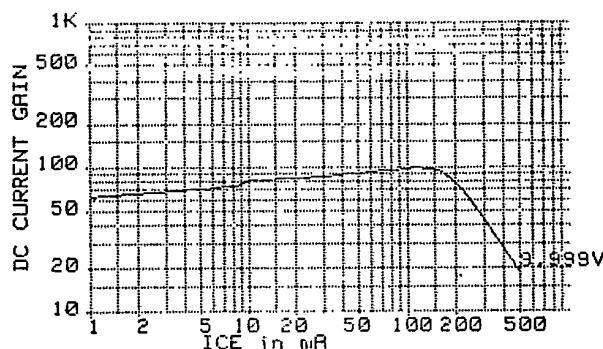
Characteristics	Symbol	Min	Max	Unit
Collector-Emitter Breakdown Voltage* (IC = 10mA _{dc})	BVCEO	350		Volts
Collector-Base Breakdown Voltage (IC = 10μA _{dc})	BVCBO	450		Volts

ELECTRICAL CHARACTERISTICS

Characteristics	Symbol	Min	Max	Unit
Emitter-Base Breakdown Voltage ($I_E = 10\mu\text{A}$, $V_{CE} = 10\text{V}$)	BVEBO	7		Vdc
Collector Cutoff Current ($V_{CE} = 300\text{V}$, $I_B = 0$)	ICEO		10	μA
Collector Cutoff Current ($V_{CB} = 400\text{V}$, $I_E = 0$)	ICBO		1	μA
Emitter Cutoff Current ($V_{EB} = 6\text{V}$, $I_C = 0$)	IEBO		500	nA
DC Current Gain* ($I_C = 100\mu\text{A}$, $V_{CE} = 10\text{V}$) ($I_C = 10\text{mA}$, $V_{CE} = 10\text{V}$) ($I_C = 300\text{mA}$, $V_{CE} = 10\text{V}$)	hFE	50 70 30		
Collector-Emitter Saturation Voltage* ($I_C = 100\text{mA}$, $I_B = 10\text{mA}$) ($I_C = 300\text{mA}$, $I_B = 30\text{mA}$)	VCE(SAT)		0.4 1.5	Vdc
Base-Emitter Saturation Voltage* ($I_C = 100\text{mA}$, $I_B = 10\text{mA}$) ($I_C = 300\text{mA}$, $I_B = 30\text{mA}$)	VBE(SAT)		0.8 1.0	Vdc
Current Gain Bandwidth Product ($I_C = 10\text{mA}$, $V_{CE} = 10\text{V}$, $f = 10\text{MHz}$)	fT	25		MHz
Output Capacitance ($V_{CB} = 10\text{V}$, $I_E = 0$, $f = 1\text{MHz}$)	Cob		20	pF
Input Capacitance ($V_{BE} = 0.5\text{V}$, $I_C = 0$, $f = 1\text{MHz}$)	Cib		150	pF
Turn On Time ($V_{CC} = 50\text{V}$, $I_C = 10\text{mA}$, $I_{B1} = I_{B2} = 5.0\text{mA}$)	ton		500	ns
Turn Off Time	toff		2.5	us

*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

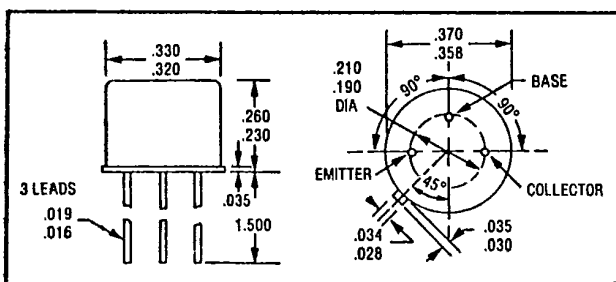
800—1000 VOLTS



14830 Valley View Avenue
La Mirada, California 90638
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CASE STYLE W

JEDEC TO-5



FEATURES

- BV_{CER} AND BV_{CBO} 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, $R_{BE} = 1K \text{ Ohms}$			Volts
2N5013	V_{CER}	800	
2N5014		900	
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 @ $T_C = 100^\circ C$	P_D	2	Watts
Derate above 100 °C		20	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	$R_{\theta JC}$	50	°C/W

ELECTRICAL CHARACTERISTICS

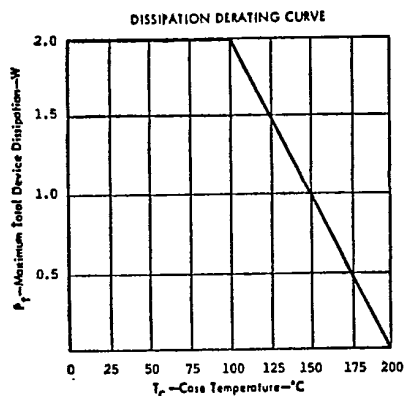
Characteristics	Symbol	Min.	Max.	Unit
Collector - Emitter Breakdown Voltage*				Vdc
2N5013		800		
2N5014		900		
2N5015	BV_{CER}^*	1000		
($I_C = 200 \text{ } \mu\text{A dc}, R_{BE} = 1 \text{ K ohms}$)				
Collector - Base Breakdown Voltage				Vdc
2N5013		800		
2N5014		900		
2N5015	BV_{CBO}	1000		
($I_C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

ELECTRICAL CHARACTERISTICS

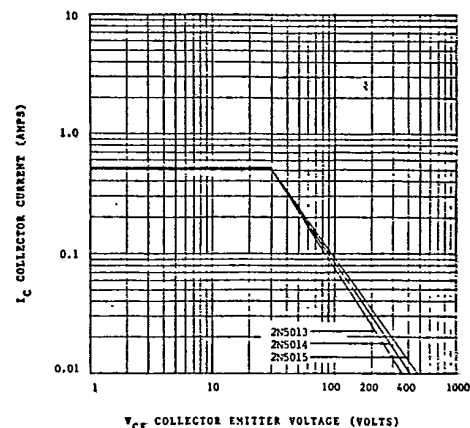
Characteristics	Symbol	Min.	Max.	Unit
Collector Cutoff Current (VCB = 650 Vdc) (VCB = 700 Vdc) (VCB = 750 Vdc)	2N5013 2N5014 2N5015	I_{CBO}	12**	μA_{dc}
Collector Cutoff Current (VCB = 650 Vdc, TA=100°C) (VCB = 700 Vdc, TA=100°C) (VCB = 750 Vdc, TA=100°C)	2N5013 2N5014 2N5015	I_{CBO}	100**	μA_{dc}
DC 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*	2N5013 2N5014 2N5015	$V_{CE(SAT)}$	1.6 1.6 1.8	Vdc
Base - Emitter Saturation Voltage*		$V_{BE(SAT)}$	1.0	Vdc
Current - Gain - Bandwidth 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, $I_C = 100$ mAdc, $I_{B1} = I_{B2} = 10$ mAdc)	t_d t_r t_s t_f		200 1200 3.0 800	ns ns us ns

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

**Typically 1 uA

TYPICAL OPERATING CURVES

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

CURVES APPLY BELOW RATED V_{CEO} $T_C = 25^\circ C$ 

SOLID STATE DEVICES, INC.

2N5095 AND 2N5097

1 AMP

HIGH VOLTAGE NPN TRANSISTOR

500-600 VOLTS

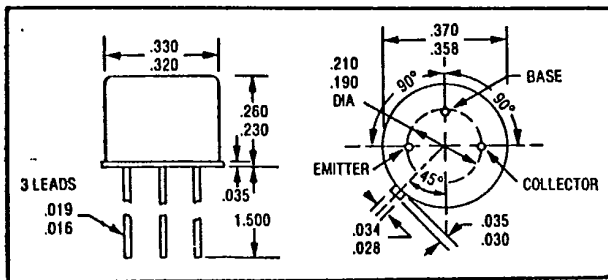


14830 Valley View Avenue
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(213) 921-9660
TWX 910-583-4807
FAX 213-921-2396

CASE STYLE W

JEDEC TO-5

FEATURES



- BV_{CEO} 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	T _J , T _{stg}	-65 to +200		°C

THERMAL CHARACTERISTICS

Characteristics	Symbol	Value	Unit
Thermal Resistance, Junction to Case	R _{θJC}	50	°C/W

ELECTRICAL CHARACTERISTICS

Characteristics		Symbol	Min.	Max.	Unit
Collector - Emitter Breakdown Voltage* (I _C = 50 mA dc)	2N5095 2N5097	BV _{CEO} *	400 450		Vdc
(I _C = 100 uA dc, R _{BE} = 1K Ohms)	2N5095 2N5097	BV _{CER} *	500 600		Vdc
Collector - Base Breakdown Voltage (I _C = 100 uA dc)	2N5095 2N5097	BV _{CBO}	500 600		Vdc
Emitter - Base Breakdown Voltage (I _E = 20 uA dc)		BV _{EBO}	6		Vdc

ELECTRICAL CHARACTERISTICS

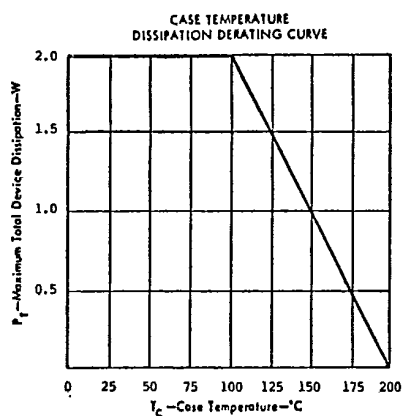
Characteristics	Symbol	Min.	Max.	Unit
Collector Cutoff Current 2N5095 VCB = 400 Vdc 2N5097 VCB = 500 Vdc	I_{CBO}		500	nAdc
Emitter Cutoff Current ($V_{EB} = 4$ Vdc)	I_{EBO}		250	nAdc
DC Current Gain* ($I_C = 1$ mAdc, $V_{CE} = 10$ Vdc) ($I_C = 25$ mAdc, $V_{CE} = 5$ Vdc) ($I_C = 100$ mAdc, $V_{CE} = 5$ Vdc)	h_{FE}^*	25 50 15	250 300 250	
Collector - Emitter Saturation Voltage* ($I_C = 25$ mAdc, $I_B = 2.5$ mAdc)	$V_{CE(SAT)}^*$		0.5	Vdc
Base - Emitter Voltage* ($I_C = 25$ mAdc, $V_{CE} = 5$ 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

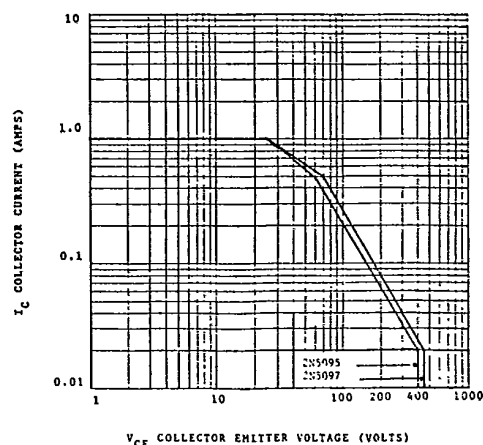
Delay Time	$V_{CC} = 125$ Vdc	t_d	200	ns
Rise Time	$I_C = 100$ mAdc,	t_r	1200	ns
Storage Time		t_s	3.0	us
Fall Time	$I_{B1} = I_{B2} = 10$ mAdc)	t_f	800	ns

*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 V_{CEO} $T_C = 25^\circ\text{C}$



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