

LOW COLLECTOR SATURATION VOLTAGE LARGE CURRENT

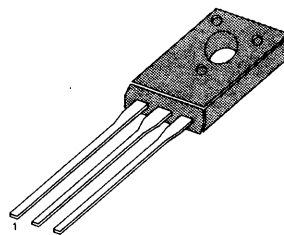
HIGH POWER DISSIPATION : $P_T = 1.3W$ ($T_a = 25^\circ C$)
Complementary to KSB1151

ABSOLUTE MAXIMUM RATINGS ($T_a = 25^\circ C$)

Characteristic	Symbol	Rating	Unit
Collector-Base Voltage	V_{CBO}	60	V
Collector-Emitter Voltage	V_{CEO}	60	V
Emitter-Base Voltage	V_{EBO}	7	V
Collector Current (DC)	I_C	5	A
*Collector Current (Pulse)	I_C	8	A
Base Current (DC)	I_B	1	A
Collector Dissipation ($T_a = 25^\circ C$)	P_C	1.3	W
Collector Dissipation ($T_c = 25^\circ C$)	P_C	20	W
Junction Temperature	T_J	150	$^\circ C$
Storage Temperature	T_{stg}	$-55 \sim 150$	$^\circ C$

* $PW \leq 10ms$, duty cycle $\leq 50\%$

TO-126



1. Emitter 2. Collector 3. Base

3

ELECTRICAL CHARACTERISTICS ($T_a = 25^\circ C$)

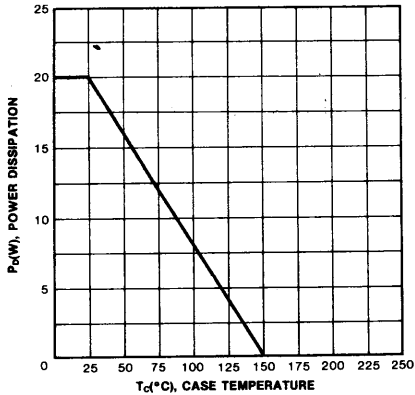
Characteristic	Symbol	Test Condition	Min	Typ	Max	Unit
Collector Cutoff Current	I_{CBO}	$V_{CB} = 50V, I_E = 0$			10	μA
Emitter Cutoff Current	I_{EBO}	$V_{EB} = 7V, I_C = 0$			10	μA
*DC Current Gain	h_{FE1}	$V_{CE} = 1V, I_C = 0.1A$	60			
	h_{FE2}	$V_{CE} = 1V, I_C = 2A$	100		400	
	h_{FE3}	$V_{CE} = 1V, I_C = 5A$	50			
*Collector-Emitter Saturation Voltage	$V_{CE(sat)}$	$I_C = 2A, I_B = 0.2A$		0.1	0.3	V
*Base-Emitter Saturation Voltage	$V_{BE(sat)}$	$I_C = 2A, I_B = 0.2A$		0.9	1.2	V
Turn On Time	t_{on}	$I_C = 2A, I_{B1} = -I_{B2} = 0.2A$		0.2	1	μS
Storage Time	t_{stg}	$R_L = 5\Omega, V_{CC} = 10V$		1.1	2.5	μS
Fall Time	t_f			0.2	1	μS

* Pulse test: $PW \leq 350\mu s$, duty cycle $\leq 2\%$ Pulsed

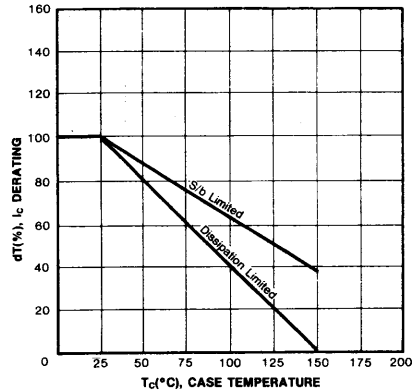
h_{FE} (2) CLASSIFICATION

Classification	O	Y	G
$h_{FE} 2$	100-200	160-320	200-400

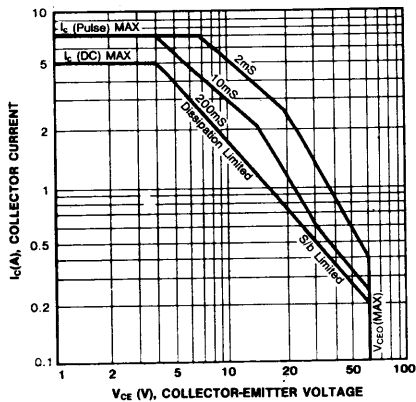
POWER DERATING



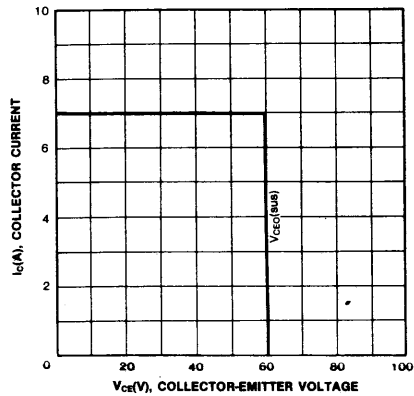
DERATING CURVE OF SAFE OPERATING AREAS



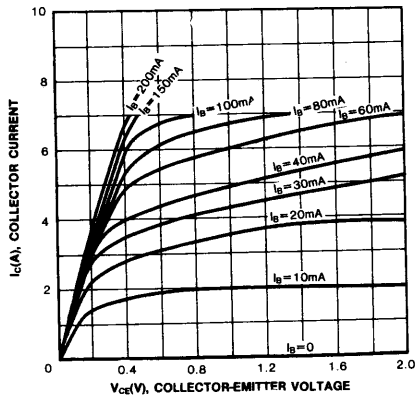
FORWARD BIAS SAFE OPERATING AREA



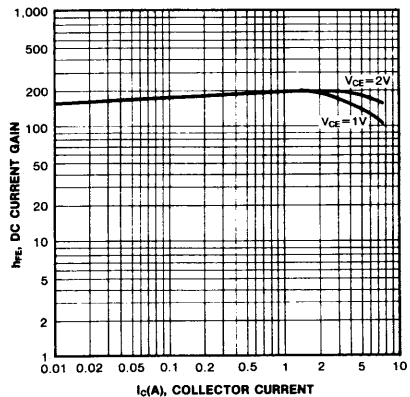
REVERSE BIAS SAFE OPERATING AREA

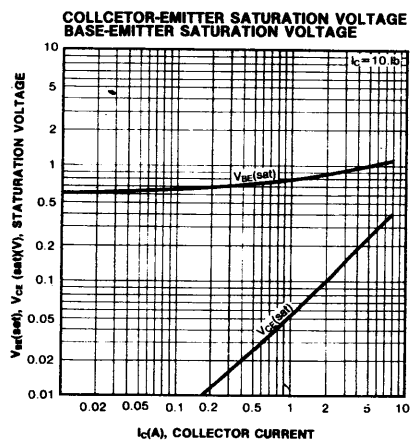


STATIC CHARACTERISTIC



DC CURRENT GAIN





HIGH DC CURRENT GAIN
LOW COLLECTOR SATURATION VOLTAGE
BUILT-IN A DAMPER DIODE AT E-C

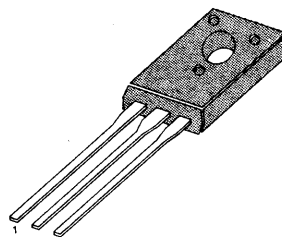
HIGH POWER DISSIPATION : $P_T = 1.3W$ ($T_a = 25^\circ C$)

ABSOLUTE MAXIMUM RATINGS ($T_a = 25^\circ C$)

Characteristic	Symbol	Rating	Unit
Collector-Base Voltage	V_{CBO}	150	V
Collector-Emitter Voltage	V_{CEO}	100	V
Emitter-Base Voltage	V_{EBO}	8	V
Collector Current (DC)	I_C	3	A
* Collector Current (Pulse)	I_C	5	A
Collector Dissipation ($T_a = 25^\circ C$)	P_C	1.3	W
Collector Dissipation ($T_c = 25^\circ C$)	P_C	15	W
Junction Temperature	T_J	150	$^\circ C$
Storage Temperature	T_{stg}	-55~150	$^\circ C$

* $PW \leq 10$ mS duty cycle $\leq 50\%$

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1. Emitter 2. Collector 3. Base

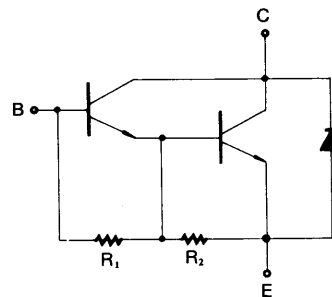
ELECTRICAL CHARACTERISTICS ($T_a = 25^\circ C$)

Characteristic	Symbol	Test Condition	Min	Typ	Max	Unit
Collector Cutoff Current	I_{CBO}	$V_{CB} = 100V, I_E = 0$			10	μA
Emitter Cutoff Current	I_{EBO}	$V_{EB} = 5V, I_C = 0$			2	mA
* DC Current Gain	h_{FE1}	$V_{CE} = 2V, I_C = 1.5A$	2000		20000	
	h_{FE2}	$V_{CE} = 2V, I_C = 3A$	1000			
* Collector-Emitter Saturation Voltage	$V_{CE(sat)}$	$I_C = 1.5A, I_B = 1.5mA$		0.9	1.2	V
* Base-Emitter Saturation Voltage	$V_{BE(sat)}$	$I_C = 1.5A, I_B = 1.5mA$		1.5	2	V
Turn On Time	t_{on}	$I_C = 1.5A, I_{B1} = -I_{B2} = 1.5mA$		0.5		μS
Storage Time	t_{stg}	$R_L = 27\Omega, V_{CC} = 40V$		2		μS
Fall Time	t_f			1		μS

* Pulse test: $PW \leq 350\mu s$, duty cycle $\leq 2\%$ Pulsed

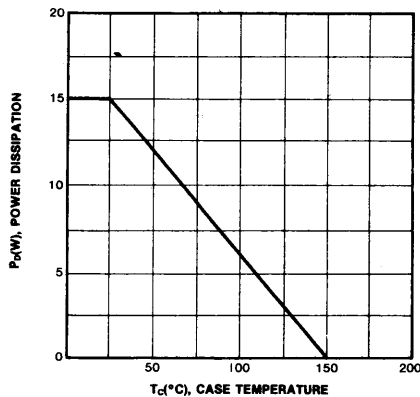
h_{FE} (1) CLASSIFICATION

Classification	O	Y	G
$h_{FE} 1$	2000-5000	4000-12000	6000-20000

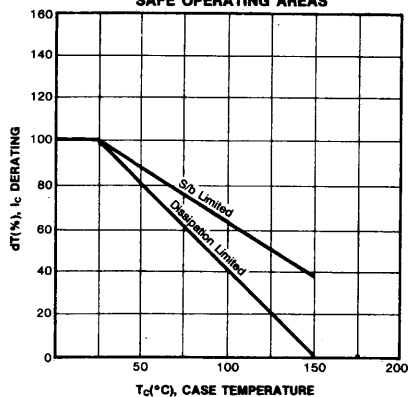


$R1 = 8 k\Omega$
 $R2 = 0.6 k\Omega$

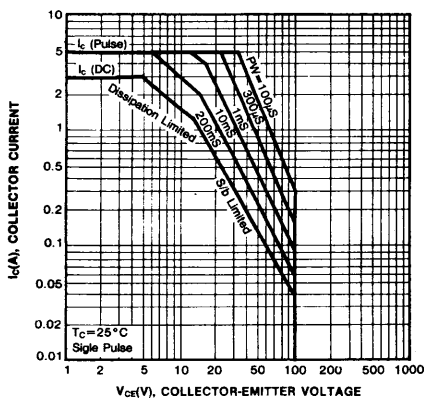
POWER DERATING



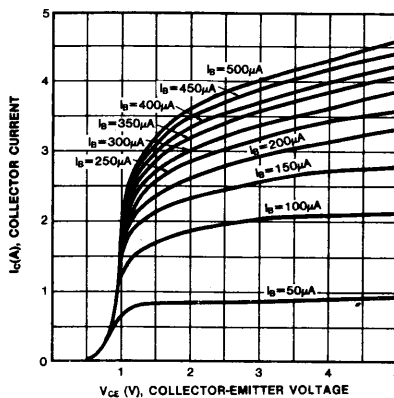
DERATING CURVE OF SAFE OPERATING AREAS



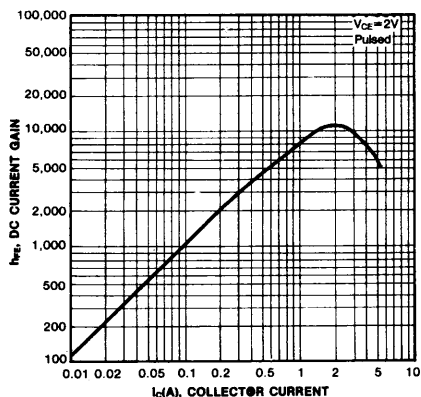
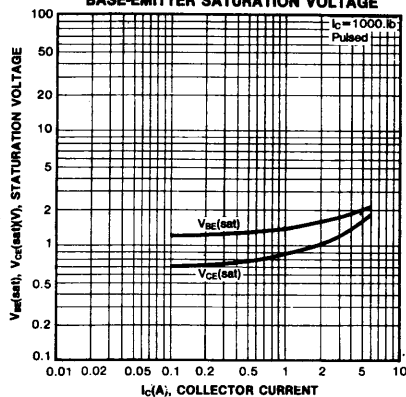
FORWARD BIAS SAFE OPERATING AREA



STATIC CHARACTERISTIC



DC CURRENT GAIN

COLLECTOR-EMITTER SATURATION VOLTAGE
BASE-EMITTER SATURATION VOLTAGE

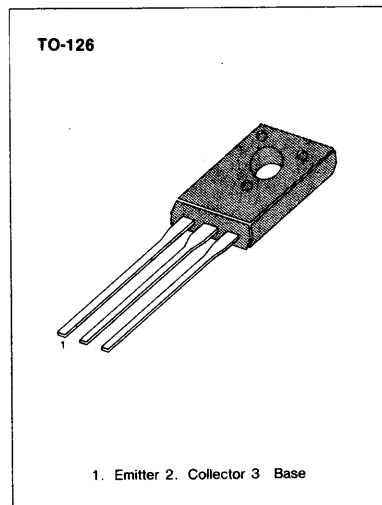
HIGH DC CURRENT GAIN
LOW COLLECTOR SATURATION VOLTAGE
BUILT-IN A ZENER DIODE AT B-C AND
A DAMPER DIODE AT E-C

HIGH POWER DISSIPATION : $P_T = 1.3W$ ($T_a = 25^\circ C$)

ABSOLUTE MAXIMUM RATINGS ($T_a = 25^\circ C$)

Characteristic	Symbol	Rating	Unit
Collector-Base Voltage	V_{CBO}	60 ± 10	V
Collector-Emitter Voltage	V_{CEO}	60 ± 10	V
Emitter-Base Voltage	V_{EBO}	8	V
Collector Current (DC)	I_C	3	A
* Collector Current (Pulse)	I_C	5	A
Collector Dissipation ($T_a = 25^\circ C$)	P_C	1.3	W
Collector Dissipation ($T_c = 25^\circ C$)	P_C	15	W
Junction Temperature	T_J	150	$^\circ C$
Storage Temperature	T_{stg}	$-55 \sim 150$	$^\circ C$

* $PW \leq 10ms$, duty cycle $\leq 50\%$



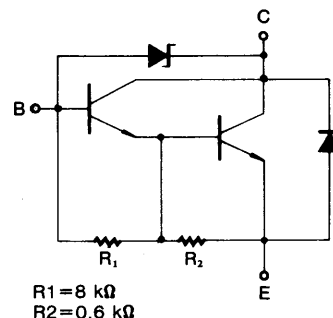
ELECTRICAL CHARACTERISTICS ($T_a = 25^\circ C$)

Characteristic	Symbol	Test Condition	Min	Typ	Max	Unit
Collector-Base Voltage	V_{CBO}	$I_C = 1mA, I_E = 0$	50	60	70	V
Collector-Emitter Voltage	V_{CEO}	$I_C = 10mA, R_{BE} = \infty$	50	60	70	V
Collector Cutoff Current	I_{CBO}	$V_{CB} = 40V, I_E = 0$			10	μA
Emitter Cutoff Current	I_{EBO}	$V_{EB} = 5V, I_C = 0$			2	mA
* DC Current Gain	h_{FE1}	$V_{CE} = 2V, I_C = 1.5A$	2000		20000	
	h_{FE2}	$V_{CE} = 2V, I_C = 3A$	1000			
* Collector-Emitter Saturation Voltage	$V_{CE(sat)}$	$I_C = 1.5A, I_B = 1.5mA$		0.9	1.2	V
* Base-Emitter Saturation Voltage	$V_{BE(sat)}$	$I_C = 1.5A, I_B = 1.5mA$		1.5	2	V
Turn On Time	t_{on}	$I_C = 1.5A, I_{B1} = -I_{B2} = 1.5mA$		0.5		μS
Storage Time	t_{stg}	$R_L = 27\Omega, V_{CC} = 40V$		2		μS
Fall Time	t_f			1		μS

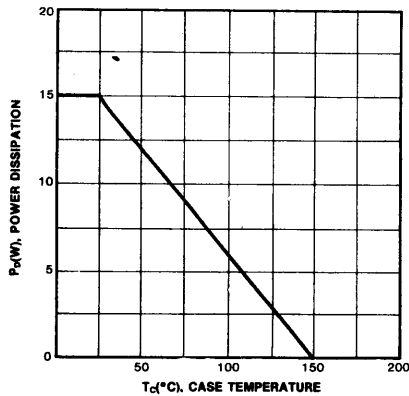
* Pulse test: $PW \leq 350\mu s$, duty cycle $\leq 2\%$ Pulsed

h_{FE} (1) CLASSIFICATION

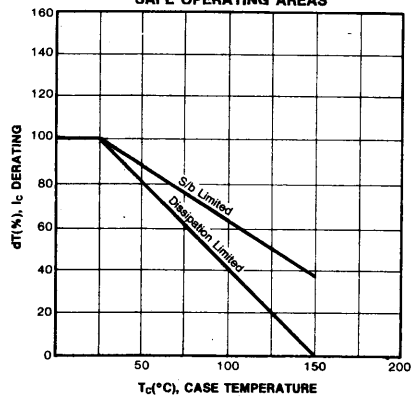
Classification	O	Y	G
$h_{FE} 1$	2000-5000	4000-12000	6000-20000



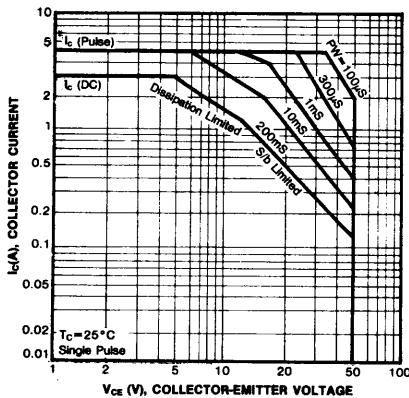
POWER DERATING



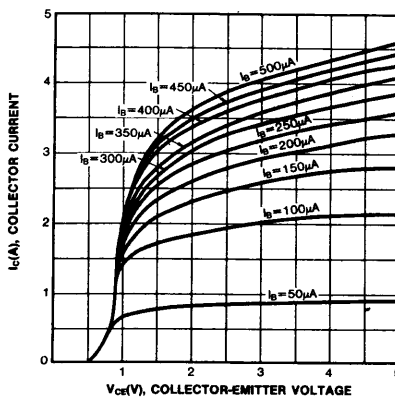
DERATING CURVE OF SAFE OPERATING AREAS



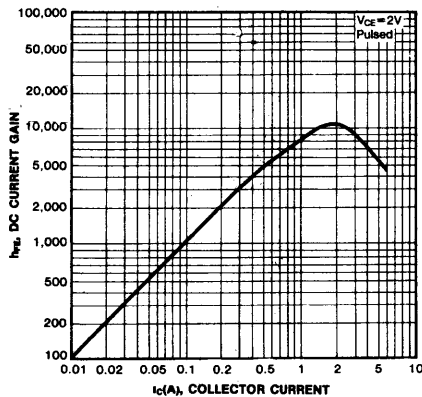
FORWARD BIAS SAFE OPERATING AREA



STATIC CHARACTERISTIC



DC CURRENT GAIN

COLLECTOR-EMITTER SATURATION VOLTAGE
BASE-EMITTER SATURATION VOLTAGE