

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

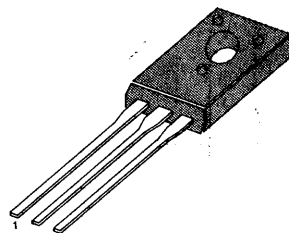
HIGH POWER DISSIPATION: $P_T=1.3W$ ($T_a=25^\circ C$)

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

Characteristic	Symbol	Rating	Unit
Collector-Base Voltage	V_{CBO}	-100	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	$^\circ C$

* $PW \leq 10ms$, Duty Cycle $\leq 50\%$

TO-126



1. Emitter 2. Collector 3. Base

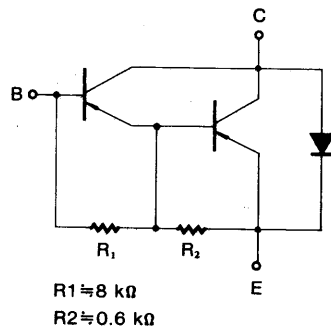
ELECTRICAL CHARACTERISTICS ($T_a=25^\circ C$)

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		15000	
	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}	$I_C = -1.5A$		0.5		μS
Storage Time	t_{stg}	$I_B1 = -I_B2 = -1.5mA$		2		μS
Fall Time	t_f	$R_L = 27\Omega, V_{CC} = -40V$		1		μS

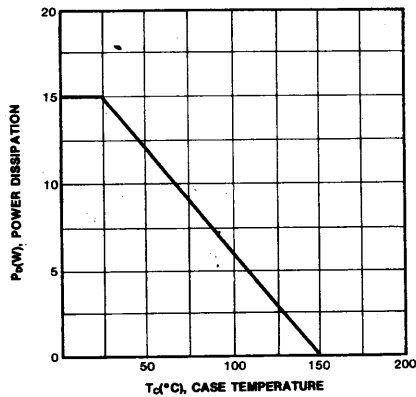
* Pulse test: $PW \leq 350\mu s$, duty cycle $\leq 2\%$ Pulsed

$h_{FE}(1)$ CLASSIFICATION

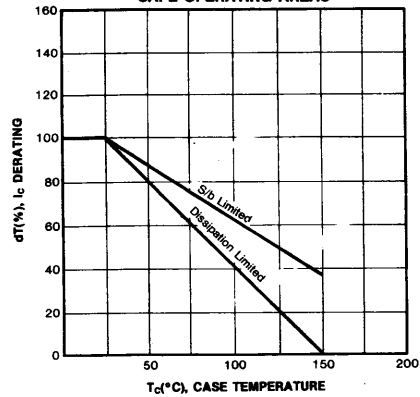
Classification	O	Y	G
h_{FE1}	2000-5000	4000-12000	6000-20000



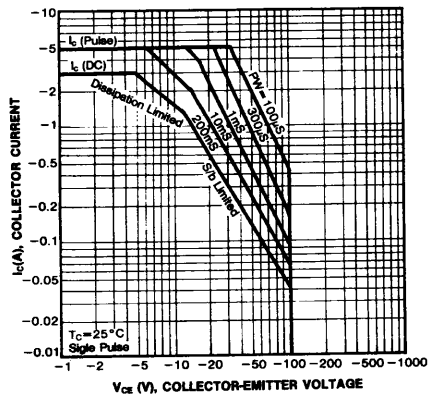
POWER DERATING



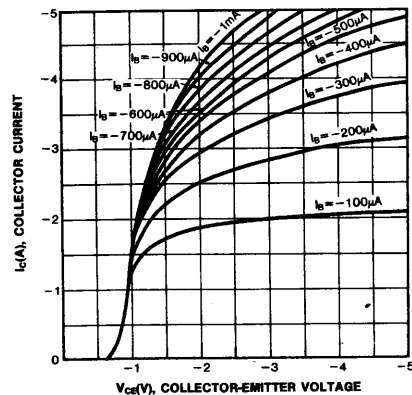
DERATING CURVE OF SAFE OPERATING AREAS



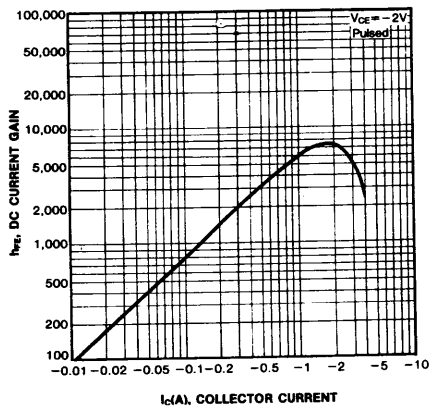
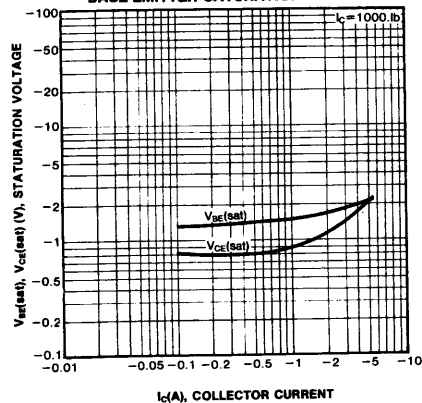
FORWARD BIAS SAFE OPERATING AREA



STATIC CHARACTERISTIC



DC CURRENT GAIN

COLLECTOR-EMITTER SATURATION VOLTAGE
BASE-EMITTER SATURATION VOLTAGE

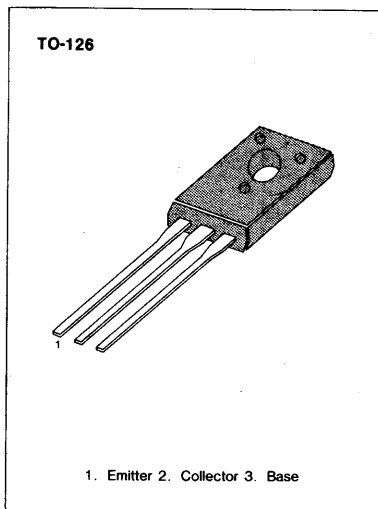
HIGH DC CURRENT GAIN
LOW COLLECTOR SATURATION VOLTAGE
BUILT-IN A ZENER DIODE AT B-C AND
A DAMPER DIODE AT E-C

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

ABSOLUTE MAXIMUM RATINGS (T_a=25°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 ($T_a = 25^\circ\text{C}$)	P_C	1.3	W
Collector Dissipation ($T_C = 25^\circ\text{C}$)	P_C	15	W
Junction Temperature	T_j	150	$^\circ\text{C}$
Storage Temperature	T_{stg}	$-55 \sim 150$	$^\circ\text{C}$

* PW≤10ms, Duty Cycle≤50%



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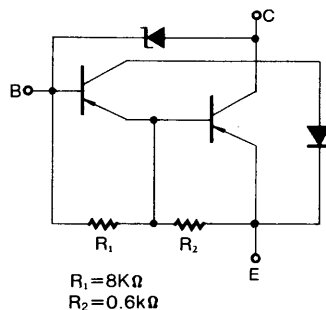
ELECTRICAL CHARACTERISTICS (T_a=25°C)

Characteristic	Symbol	Test Condition	Min	Typ	Max	Unit
Collector-Base Voltage	V_{CBO}	$I_C = -1\text{mA}, I_E = 0$	-50	-60	-70	V
Collector-Emitter Voltage	V_{CEO}	$I_C = -10\text{mA}, R_{BE} = \infty$	-50	-60	-70	V
Collector Cutoff Current	I_{CBO}	$V_{CB} = -40\text{V}, I_E = 0$			-10	μA
Emitter Cutoff Current	I_{EBO}	$V_{EB} = -5\text{V}, I_C = 0$			-2	mA
*DC Current Gain	h_{FE1} h_{FE2}	$V_{CE} = -2\text{V}, I_C = -1.5\text{A}$ $V_{CE} = -2\text{V}, I_C = -3\text{A}$	2000 1000		15000	
*Collector-Emitter Saturation Voltage	$V_{CE(sat)}$	$I_C = -1.5\text{A}, I_B = -1.5\text{mA}$		-0.9	-1.2	V
*Base-Emitter Saturation Voltage	$V_{BE(sat)}$	$I_C = -1.5\text{A}, I_B = -1.5\text{mA}$		-1.5	-2	V
Turn On Time	t_{on}	$I_C = 1.5\text{A}$		0.5		μS
Storage Time	t_{stg}	$I_{B1} = -I_{B2} = 1.5\text{mA}$		2		μS
Fall Time	t_f	$R_L = 27\Omega, V_{CC} = 40\text{V}$		1		μS

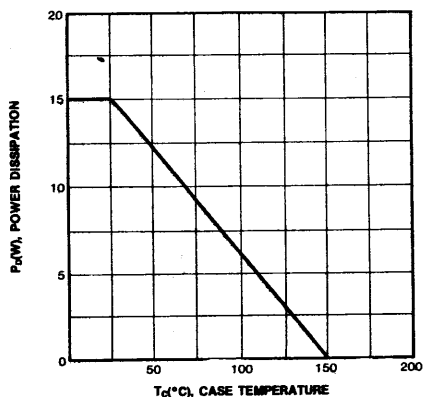
* Pulse test: $PW \leq 350\mu s$, Duty Cycle $\leq 2\%$ Pulsed

h_{FE}(1) CLASSIFICATION

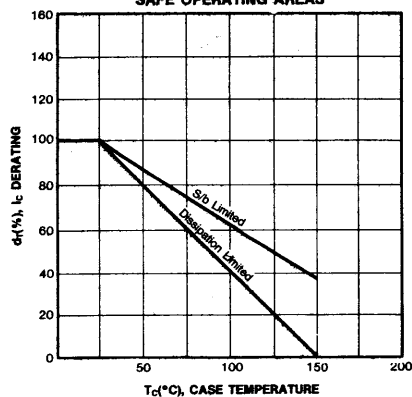
Classification	O	Y	G
h _{FE} 1	2000-5000	4000-12000	6000-20000



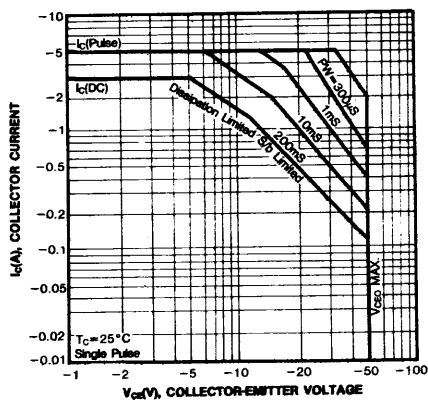
POWER DERATING



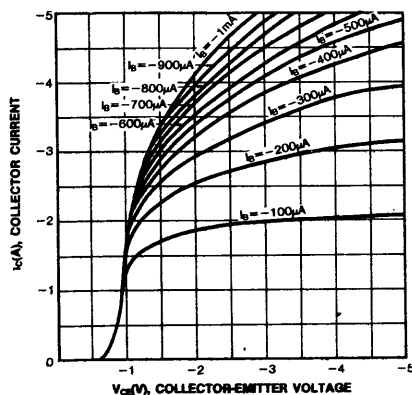
DERATING CURVE OF SAFE OPERATING AREAS



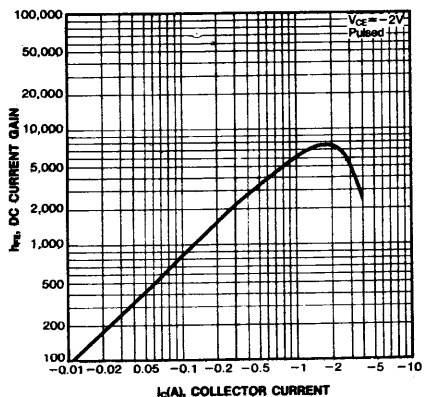
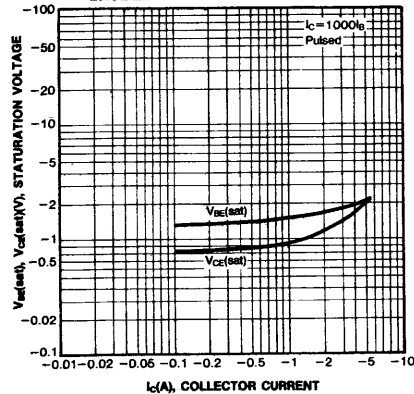
FORWARD BIAS SAFE OPERATING AREA



STATIC CHARACTERISTIC



DC CURRENT GAIN

COLLECTOR-EMITTER SATURATION VOLTAGE
BASE-EMITTER SATURATION VOLTAGE

LOW COLLECTOR SATURATION VOLTAGE LARGE CURRENT

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

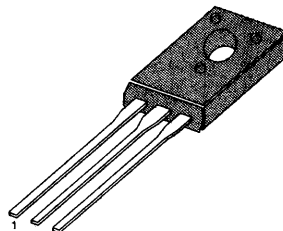
Complementary to KSD1691

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}	-55~150	$^\circ C$

* $P_W \leq 10ms$, Duty Cycle $\leq 50\%$

TO-126



1. Emitter 2. Collector 3. Base

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

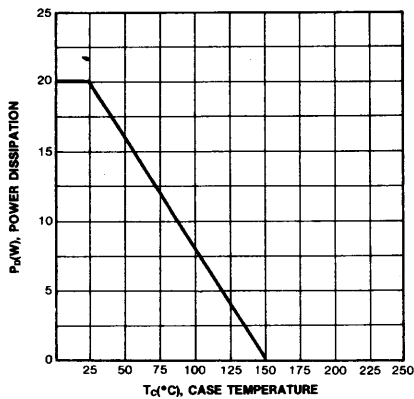
Characteristic	Symbol	Test Condition	Min	Typ	Max	Unit
Collector Cutoff Current	I_{CBO}	$V_{CB}=-50V, I_E=0$			-10	μA
Emitter Cutoff Current	I_{EBO}	$V_{EB}=-7V, I_C=0$			-10	μA
* DC Current Gain	h_{FE1}	$V_{CE}=-1V, I_C=-0.1A$	60			
	h_{FE2}	$V_{CE}=-1V, I_C=-2A$	100	200	400	
	h_{FE3}	$V_{CE}=-2V, I_C=-5A$	50			
* Collector-Emitter Saturation Voltage	$V_{CE(sat)}$	$I_C=-2A, I_B=-0.2A$		-0.14	-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}	$I_C=-2A, I_{B1}=-I_{B2}=0.2A$		0.15	1	μS
Storage Time	t_{stg}	$RL=5\Omega, V_{CC}=-10V$		0.78	2.5	μS
Fall Time	t_f			0.18	1	μS

* Pulse test: $P_W \leq 350\mu s$, Duty Cycle $\leq 2\%$ Pulsed

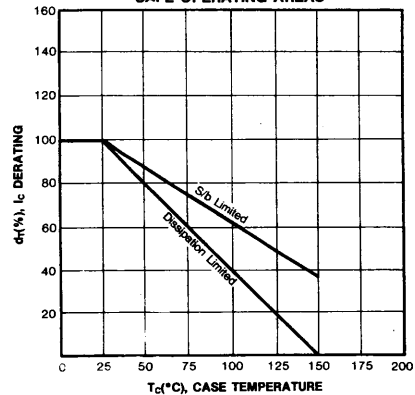
$h_{FE}(2)$ CLASSIFICATION

Classification	O	Y	G
h_{FE2}	100-200	160-320	200-400

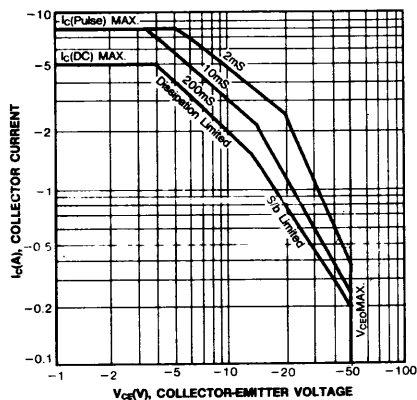
POWER DERATING



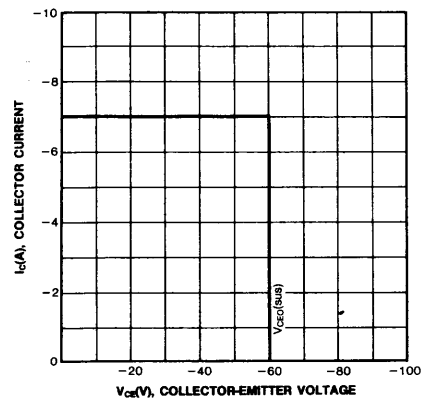
DERATING CURVE OF SAFE OPERATING AREAS



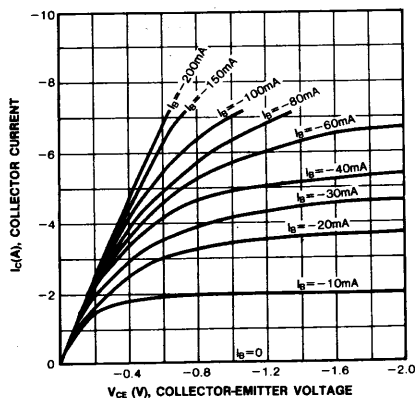
FORWARD BIAS OPERATING AREA



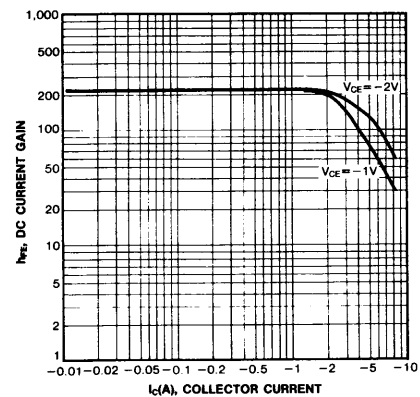
REVERSE BIAS SAFE OPERATING AREA

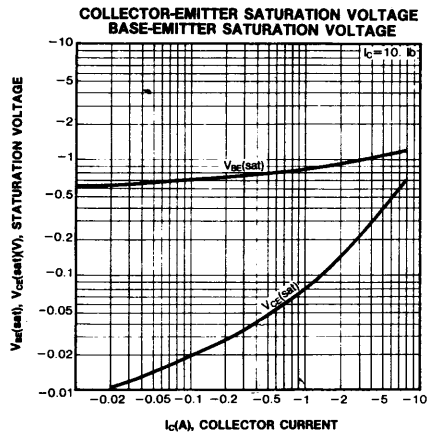


STATIC CHARACTERISTIC



DC CURRENT GAIN





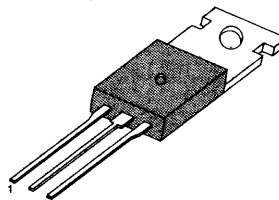
LOW FREQUENCY POWER AMPLIFIER

- Low Saturation Voltage

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

Characteristic	Symbol	Rating	Unit
Collector Base Voltage	V_{CBO}	70	V
Collector Emitter Voltage	V_{CEO}	50	V
Emitter Base Voltage	V_{EBO}	5	V
Collector Current (DC)	I_C	4	A
Collector Current (Pulse)	I_C	8	A
Collector Dissipation ($T_c = 25^\circ\text{C}$)	P_C	40	W
Junction Temperature	T_j	150	$^\circ\text{C}$
Storage Temperature	T_{stg}	$-55 \sim 150$	$^\circ\text{C}$

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1. Base 2. Collector 3. Emitter

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

Characteristic	Symbol	Test Condition	Min	Typ	Max	Unit
Collector Base Breakdown Voltage	BV_{CBO}	$I_C = 10\mu\text{A}, I_E = 0$	70			V
Collector Emitter Breakdown Voltage	BV_{CEO}	$I_C = 10\text{mA}, R_{BE} = \infty$	50			V
Emitter Base Breakdown Voltage	BV_{EBO}	$I_E = 10\mu\text{A}, I_C = 0$	5			V
Collector Cutoff Current	I_{CBO}	$V_{CB} = 50\text{V}, I_E = 0$			1	μA
DC Current Gain	h_{FE1}	$V_{CE} = 4\text{V}, I_C = 1\text{A}$	80		320	
	h_{FE2}	$V_{CE} = 4\text{V}, I_C = 0.1\text{A}$	35			
Collector Emitter Saturation Voltage	$V_{CE(sat)}$	$I_C = 2\text{A}, I_B = 0.2\text{A}$			1	V
Base Emitter Voltage	V_{BE}	$V_{CE} = 4\text{V}, I_C = 1\text{A}$			1	V
Current Gain Bandwidth Product	f_T	$V_{CE} = 4\text{V}, I_C = 0.5\text{A}$		7		MHz

 h_{FE} (1) CLASSIFICATION

Classification	B	C	D
h_{FE1}	80-120	100-200	160-320