

NPN EPITAXIAL SILICON DARLINGTON TRANSISTOR

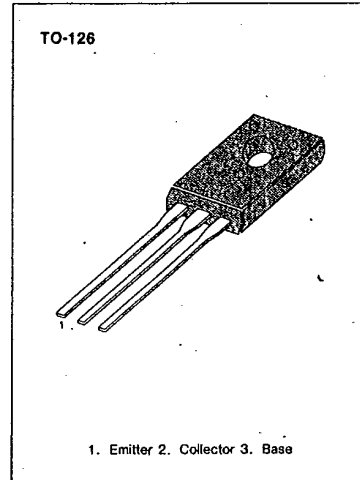
KSD986
SAMSUNG SEMICONDUCTOR INC
T-33-29

**LOW FREQUENCY POWER AMPLIFIER
LOW SPEED SWITCHING
INDUSTRIAL USE**

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

Characteristic	Symbol	Rating	Unit
Collector-Base Voltage	V_{CB0}	150	V
Collector-Emitter Voltage	V_{CE0}	80	V
Emitter-Base Voltage	V_{EB0}	8.0	V
Collector Current (DC)	I_C	± 1.5	A
*Collector Current (Pulse)	I_C	± 3.0	A
Base Current (DC)	I_B	0.15	A
Collector Dissipation ($T_a=25^{\circ}\text{C}$)	P_C	1.0	W
Collector Dissipation ($T_c=25^{\circ}\text{C}$)	P_C	10	W
Junction Temperature	T_J	150	$^{\circ}\text{C}$
Storage Temperature	T_{stg}	$-55\sim 150$	$^{\circ}\text{C}$

* $PW \leq 300\mu\text{s}$, Duty Cycle $\leq 10\%$



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

Characteristic	Symbol	Test Condition	Min	Typ	Max	Unit
Collector Cutoff Current	I_{CBO}	$V_{CB}=80\text{V}$, $I_E=0$			10	μA
Collector Cutoff Current	I_{CER}	$V_{CE}=80\text{V}$, $R_{BE}=51\Omega$ $T_a=125^{\circ}\text{C}$			1.0	mA
Collector Cutoff Current	I_{CEX1}	$V_{CE}=80\text{V}$, $V_{BE}(\text{off})=-1.5\text{V}$			10	μA
Collector Cutoff Current	I_{CEX2}	$V_{CE}=80\text{V}$, $V_{BE}(\text{off})=-1.5\text{V}$ $T_a=125^{\circ}\text{C}$			1.0	mA
Emitter Cutoff Current	I_{EBO}	$V_{EB}=5\text{V}$, $I_C=0$			1.0	mA
*DC Current Gain	h_{FE1}	$V_{CE}=2\text{V}$, $I_C=0.5\text{A}$	1000			
	h_{FE2}	$V_{CE}=2\text{V}$, $I_C=1\text{A}$	2000		30000	
*Collector-Emitter Saturation Voltage	$V_{CE}(\text{sat})$	$I_C=1\text{A}$, $I_B=1\text{mA}$			1.5	V
*Base-Emitter Saturation Voltage	$V_{BE}(\text{sat})$	$I_C=1\text{A}$, $I_B=1\text{mA}$			2.0	V
Turn On Time	t_{on}	$I_C=1\text{A}$, $R_L=50\Omega$		0.5		μs
Storage Time	t_s	$I_B1=-I_B2=1\text{mA}$		1.0		μs
Fall time	t_f	$V_{CC} \approx 50\text{V}$		1.0		μs

*Pulse Test: $PW \leq 350\mu\text{s}$, Duty Cycle $\leq 2\%$

$h_{FE}(2)$ CLASSIFICATION

Classification	R	O	Y
$h_{FE}(2)$	2000-5000	4000-10000	8000-30000


SAMSUNG SEMICONDUCTOR

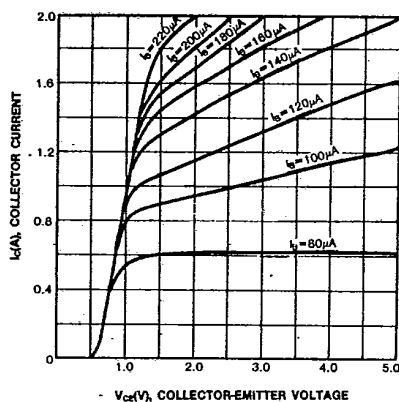
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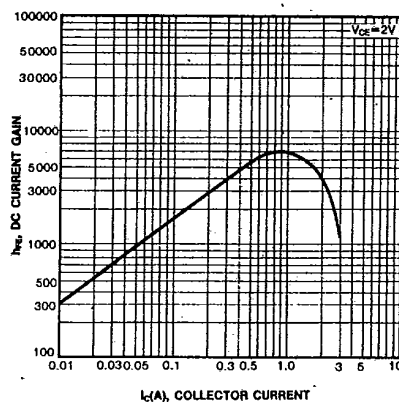
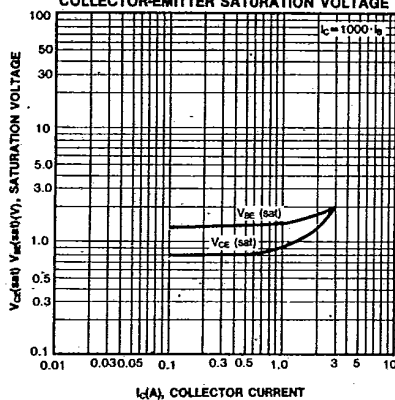
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DARLINGTON TRANSISTOR

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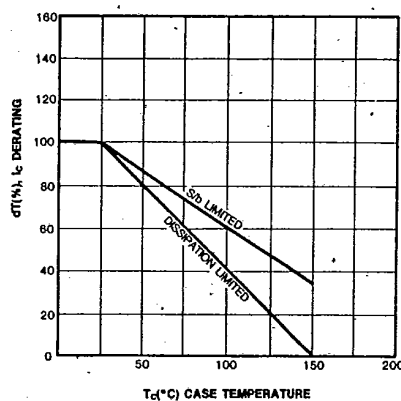
STATIC CHARACTERISTIC



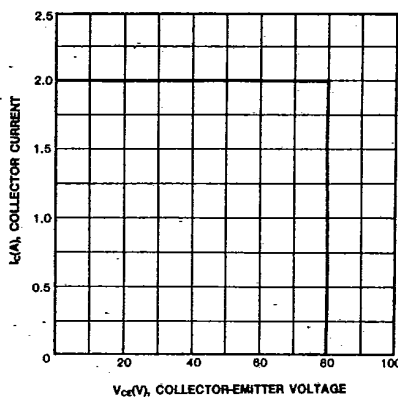
DC CURRENT GAIN

BASE-EMITTER SATURATION VOLTAGE
COLLECTOR-EMITTER SATURATION VOLTAGE

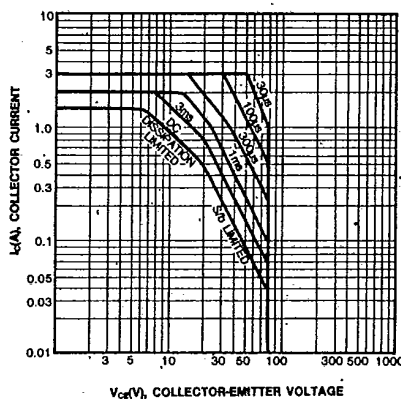
DERATING CURVE OF SAFE OPERATING AREAS



REVERSE BIAS SAFE OPERATING AREAS



SAFE OPERATING AREA



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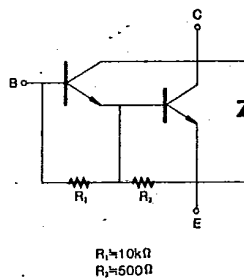
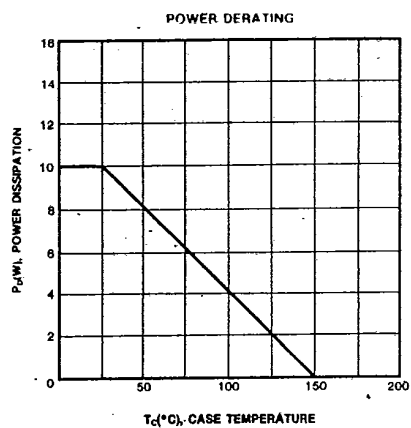
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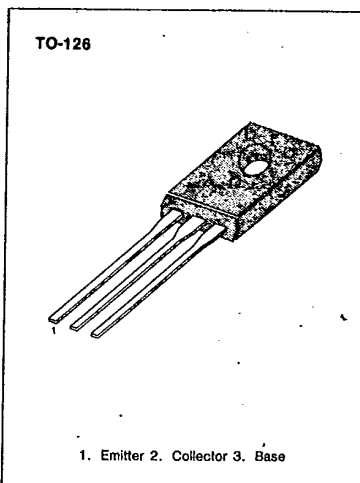
SAMSUNG SEMICONDUCTOR

KSD1691**NPN EPITAXIAL SILICON TRANSISTOR**

T-33-09

**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}	-55~150	$^\circ C$

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

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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		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

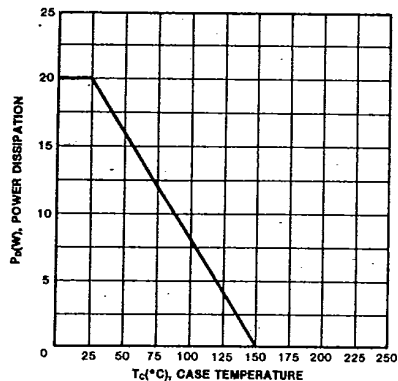
* Pulse test: $PW \leq 350\mu s$, duty cycle $\leq 2\%$ Pulsed **h_{FE} (2) CLASSIFICATION**

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

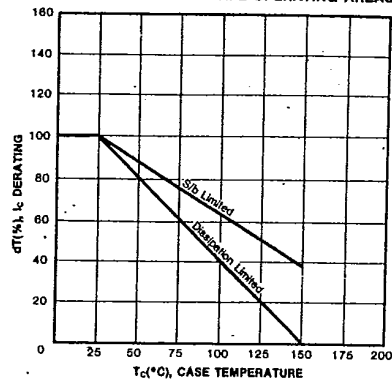


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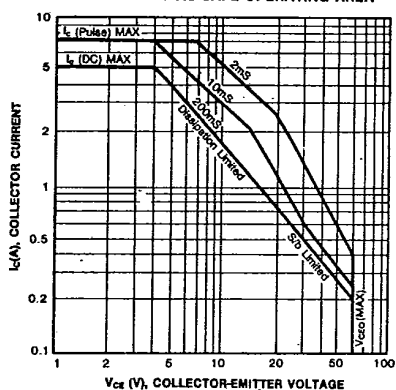
POWER DERATING



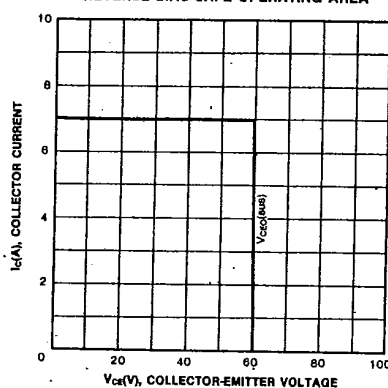
DERATING CURVE OF SAFE OPERATING AREAS



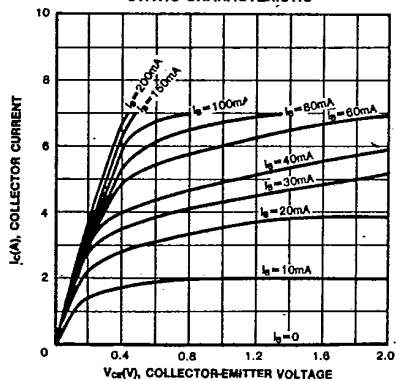
FORWARD BIAS SAFE OPERATING AREA



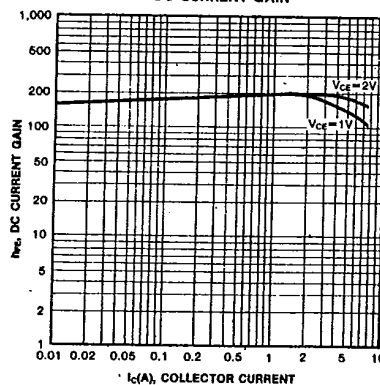
REVERSE BIAS SAFE OPERATING AREA



STATIC CHARACTERISTIC



DC CURRENT GAIN



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