

NPN EPITAXIAL SILICON DARLINGTON TRANSISTOR

KSD560

T-33-29

LOW FREQUENCY POWER AMPLIFIER
LOW SPEED SWITCHING
INDUSTRIAL USE

- Complement to KSB601

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}	100	V
Emitter-Base Voltage	V_{EB0}	7	V
Collector Current (DC)	I_C	± 5	A
*Collector Current (Pulse)	I_C	± 8	A
Base Current	I_B	0.5	A
Collector Dissipation ($T_a=25^\circ\text{C}$)	P_C	1.5	W
Collector Dissipation ($T_c=25^\circ\text{C}$)	P_C	30	W
Junction Temperature	T_J	150	$^\circ\text{C}$
Storage Temperature	T_{stg}	$-55\sim 150$	$^\circ\text{C}$

- $PW \leq 10\text{ms}$, Duty Cycle $\leq 50\%$

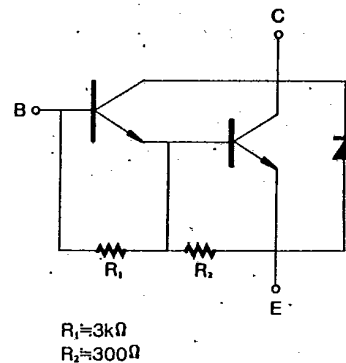
ELECTRICAL CHARACTERISTICS ($T_a=25^\circ\text{C}$)

Characteristic	Symbol	Test Condition	Min	Typ	Max	Unit
Collector Cutoff Current	I_{CBO}	$V_{CB}=100\text{V}$, $I_E=0$			1	μA
*DC Current Gain	h_{FE1}	$V_{CE}=2\text{V}$, $I_C=3\text{A}$	2000	6000	15000	
	h_{FE2}	$V_{CE}=2\text{V}$, $I_C=5\text{A}$	500			
*Collector-Emitter Saturation Voltage	$V_{CE}(\text{sat})$	$I_C=3\text{A}$, $I_B=3\text{mA}$		0.9	1.5	V
*Base-Emitter Saturation Voltage	$V_{BE}(\text{sat})$	$I_C=3\text{A}$, $I_B=3\text{mA}$		1.6	2	V
Turn On Time	t_{on}	$I_C=3\text{A}$, $R_L=16.7\Omega$		1		μs
Storage Time	t_s	$I_B1=-I_B2=3\text{mA}$		3.5		μs
Fall time	t_f	$V_{CC}=50\text{V}$		1.2		μs

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

$h_{FE}(1)$ CLASSIFICATION

Classification	R	O	Y
$h_{FE}(1)$	2000-5000	3000-7000	5000-15000

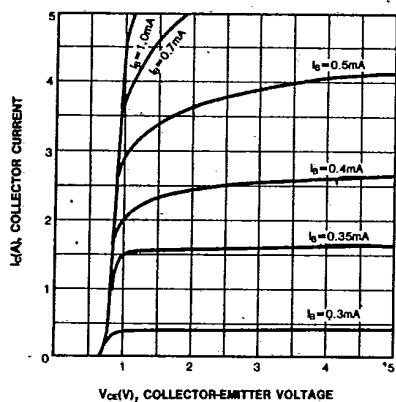


KSD560

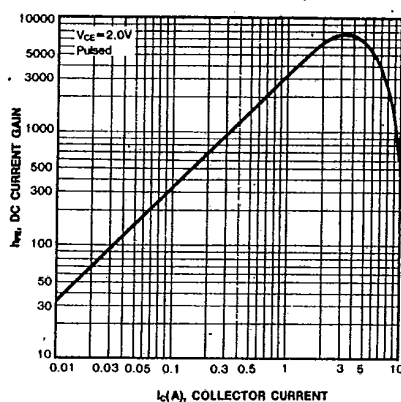
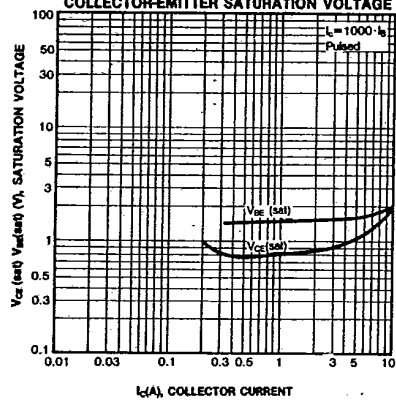
NPN EPITAXIAL SILICON
DARLINGTON TRANSISTOR

T-33-29

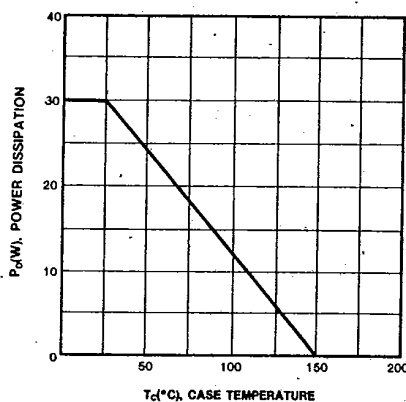
STATIC CHARACTERISTIC



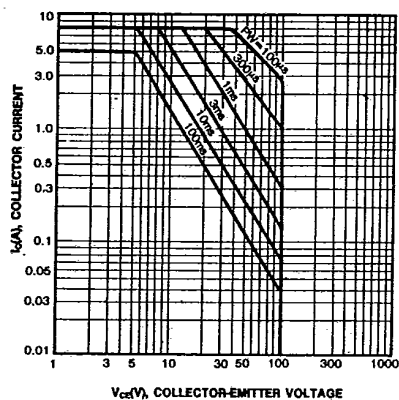
DC CURRENT GAIN

BASE-EMITTER SATURATION VOLTAGE
COLLECTOR-EMITTER SATURATION VOLTAGE

POWER DERATING



SAFE OPERATING AREA



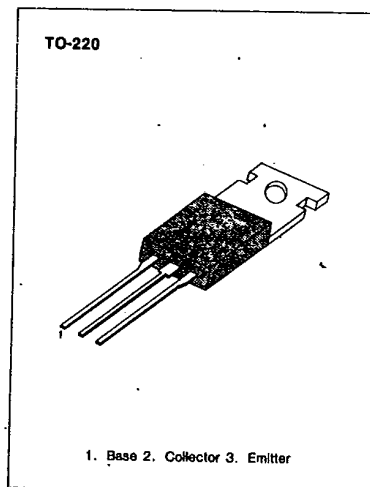
T-33-11

KSD568**NPN EPITAXIAL SILICON TRANSISTOR****LOW FREQUENCY POWER AMPLIFIER****LOW SPEED SWITCHING****INDUSTRIAL USE**

• Complement to KSB707

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

Characteristic	Symbol	Rating	Unit
Collector-Base Voltage	V_{CB0}	100	V
Collector-Emitter Voltage	V_{CE0}	60	V
Emitter-Base Voltage	V_{EB0}	7	V
Collector Current (DC)	I_C	7	A
* Collector Current (Pulse)	I_C	15	A
Base Current (DC)	I_B	3.5	A
Collector Dissipation ($T_c = 25^\circ\text{C}$)	P_C	40	W
Collector Dissipation ($T_a = 25^\circ\text{C}$)	P_C	1.5	W
Junction Temperature	T_J	150	$^\circ\text{C}$
Storage Temperature	T_{stg}	-55~150	$^\circ\text{C}$

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

3

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

Characteristic	Symbol	Test Condition	Min	Max	Unit
Collector Cutoff Current	I_{CB0}	$V_{CB} = 80\text{V}$, $I_E = 0$		10	μA
Emitter Cutoff Current	I_{EB0}	$V_{EB} = 5\text{V}$, $I_C = 0$		10	μA
* DC Current Gain	h_{FE1}	$V_{CE} = 1\text{V}$, $I_C = 3\text{A}$	40	200	
	h_{FE2}	$V_{CE} = 1\text{V}$, $I_C = 5\text{A}$	20		
* Collector-Emitter Saturation Voltage	$V_{CE(sat)}$	$I_C = 5\text{A}$, $I_B = 0.5\text{A}$		0.5	V
* Base-Emitter Saturation Voltage	$V_{BE(sat)}$	$I_C = 5\text{A}$, $I_B = 0.5\text{A}$		1.5	V

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

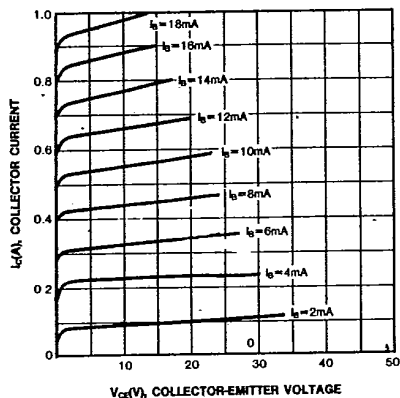
Classification	R	O	Y
h_{FE1}	40-80	60-120	100-200



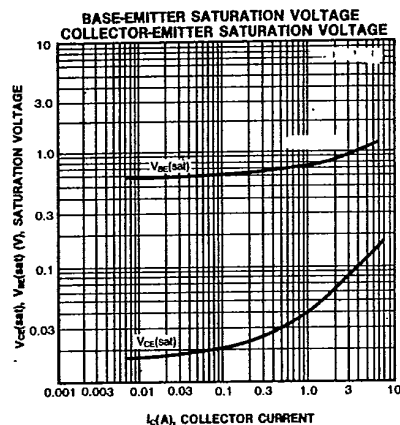
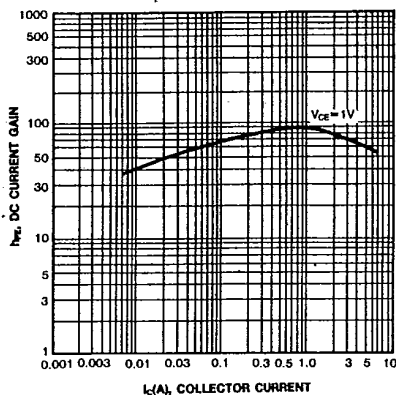
KSD568**NPN EPTAXIAL SILICON TRANSISTOR**

T-33-11

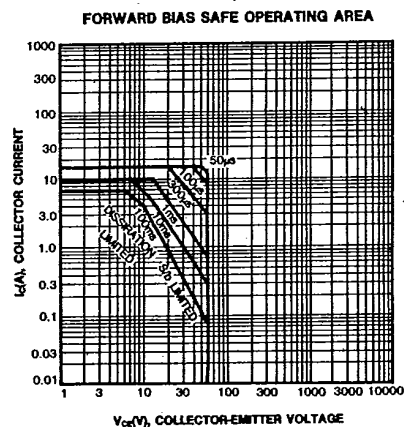
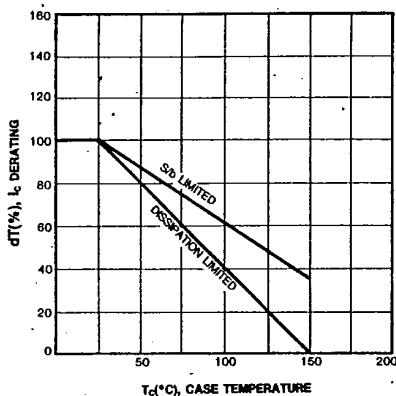
STATIC CHARACTERISTIC



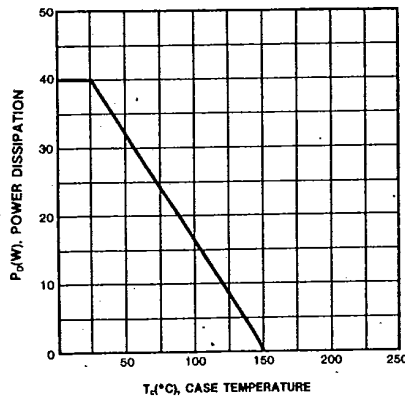
DC CURRENT GAIN



DERATING CURVE OF SAFE OPERATING AREAS



POWER DERATING



KSD569**NPN EPITAXIAL SILICON TRANSISTOR**

T-33-11

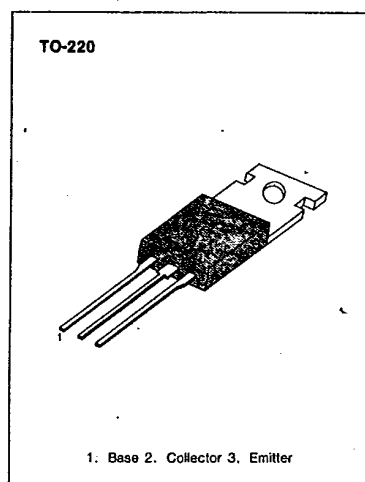
LOW FREQUENCY POWER AMPLIFIER
LOW SPEED SWITCHING
INDUSTRIAL USE

• Complement to KSB708

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

Characteristic	Symbol	Rating	Unit
Collector-Base Voltage	V_{CB0}	100	V
Collector-Emitter Voltage	V_{CE0}	80	V
Emitter-Base Voltage	V_{EB0}	7	V
Collector Current (DC)	I_C	7	A
* Collector Current (Pulse)	I_C	15	A
Base Current (DC)	I_B	3.5	A
Collector Dissipation ($T_c = 25^\circ\text{C}$)	P_C	40	W
Collector Dissipation ($T_a = 25^\circ\text{C}$)	P_C	1.5	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 $\leq 10\%$



3

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

Characteristic	Symbol	Test Condition	Min	Max	Unit
Collector Cutoff Current	I_{CBO}	$V_{CB} = 80\text{V}$, $I_E = 0$		10	μA
Emitter Cutoff Current	I_{EBO}	$V_{EB} = 5\text{V}$, $I_C = 0$		10	μA
* DC Current Gain	h_{FE1}	$V_{CE} = 1\text{V}$, $I_C = 3\text{A}$	40	200	
	h_{FE2}	$V_{CE} = 1\text{V}$, $I_C = 5\text{A}$	20		
* Collector-Emitter Saturation Voltage	$V_{CE(sat)}$	$I_C = 5\text{A}$, $I_B = 0.5\text{A}$		0.5	V
* Base-Emitter Saturation Voltage	$V_{BE(sat)}$	$I_C = 5\text{A}$, $I_B = 0.5\text{A}$		1.5	V

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

 h_{FE} (1) CLASSIFICATION

Classification	R	O	Y
$h_{FE}(1)$	40-80	80-120	100-200

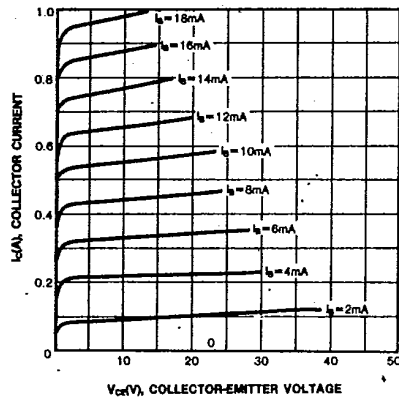


KSD569

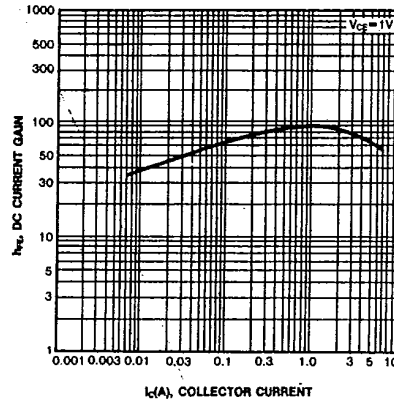
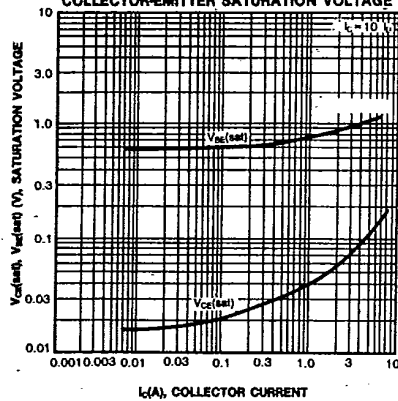
NPN EPITAXIAL SILICON TRANSISTOR

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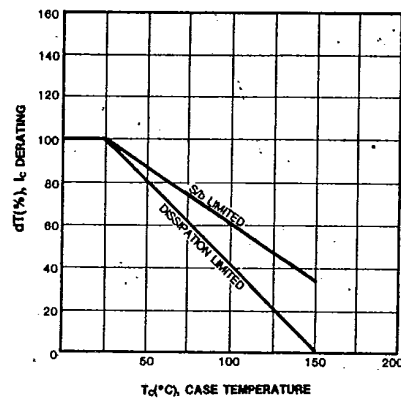
STATIC CHARACTERISTIC



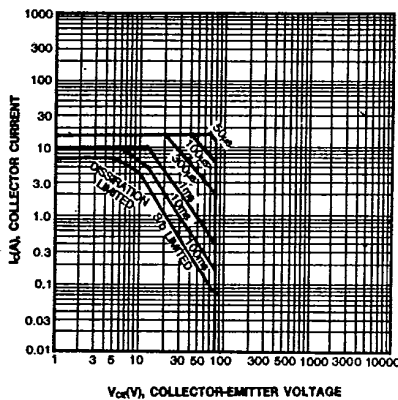
DC CURRENT GAIN

BASE-EMITTER SATURATION VOLTAGE
COLLECTOR-EMITTER SATURATION VOLTAGE

DERATING CURVE OF SAFE OPERATING AREAS



FORWARD BIAS SAFE OPERATING AREA



POWER DERATING

