

**NPN EPITAXIAL SILICON  
DARLINGTON TRANSISTOR**

**KSD560**

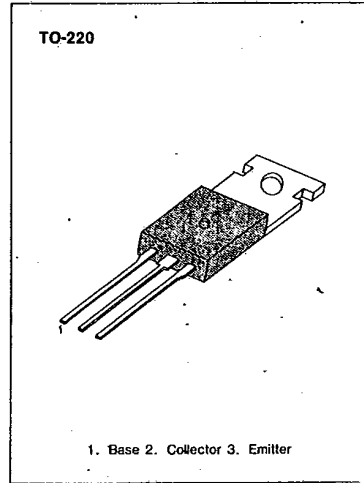
T-33-29

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

- Complement to KSB601

**ABSOLUTE MAXIMUM RATINGS (T<sub>a</sub>=25°C)**

Characteristic	Symbol	Rating	Unit
Collector-Base Voltage	V <sub>CB0</sub>	150	V
Collector-Emitter Voltage	V <sub>CE0</sub>	100	V
Emitter-Base Voltage	V <sub>EB0</sub>	7	V
Collector Current (DC)	I <sub>C</sub>	±5	A
Collector Current (Pulse)	I <sub>C</sub>	±8	A
Base Current	I <sub>B</sub>	0.5	A
Collector Dissipation (T <sub>a</sub> =25°C)	P <sub>C</sub>	1.5	W
Collector Dissipation (T <sub>c</sub> =25°C)	P <sub>C</sub>	30	W
Junction Temperature	T <sub>J</sub>	150	°C
Storage Temperature	T <sub>stg</sub>	-55~150	°C



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- PW≤10ms, Duty Cycle ≤50%

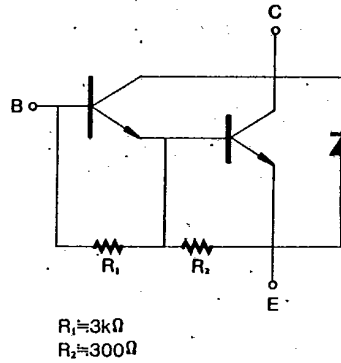
**ELECTRICAL CHARACTERISTICS (T<sub>a</sub>=25°C)**

Characteristic	Symbol	Test Condition	Min	Typ	Max	Unit
Collector Cutoff Current	I <sub>CB0</sub>	V <sub>CB</sub> =100V, I <sub>E</sub> =0			1	μA
DC Current Gain	h <sub>FE1</sub>	V <sub>CE</sub> =2V, I <sub>C</sub> =3A	2000	6000	15000	
	h <sub>FE2</sub>	V <sub>CE</sub> =2V, I <sub>C</sub> =5A	500			
Collector-Emitter Saturation Voltage	V <sub>CE</sub> (sat)	I <sub>C</sub> =3A, I <sub>B</sub> =3mA		0.9	1.5	V
Base-Emitter Saturation Voltage	V <sub>BE</sub> (sat)	I <sub>C</sub> =3A, I <sub>B</sub> =3mA		1.6	2	V
Turn On Time	t <sub>on</sub>	I <sub>C</sub> =3A, R <sub>L</sub> =16.7Ω		1		μs
Storage Time	t <sub>s</sub>	I <sub>B1</sub> =-I <sub>B2</sub> =3mA		3.5		μs
Fall time	t <sub>f</sub>	V <sub>CC</sub> =50V		1.2		μs

- Pulse Test: PW≤350μs, Duty Cycle≤2% Pulsed

**h<sub>FE</sub>(1) CLASSIFICATION**

Classification	R	O	Y
h <sub>FE</sub> (1)	2000-5000	3000-7000	5000-15000

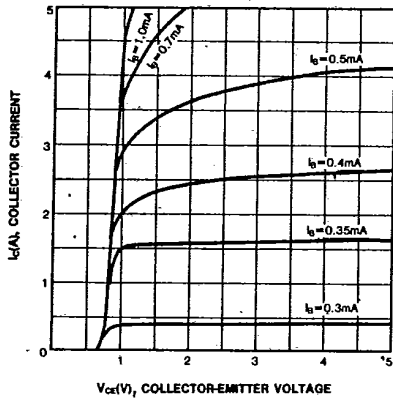


**NPN EPITAXIAL SILICON  
DARLINGTON TRANSISTOR**

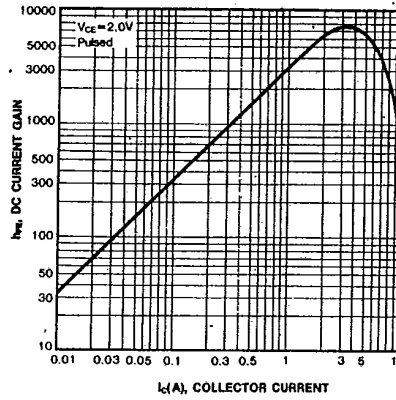
**KSD560**

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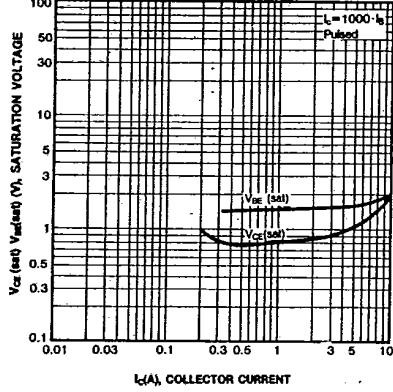
**STATIC CHARACTERISTIC**



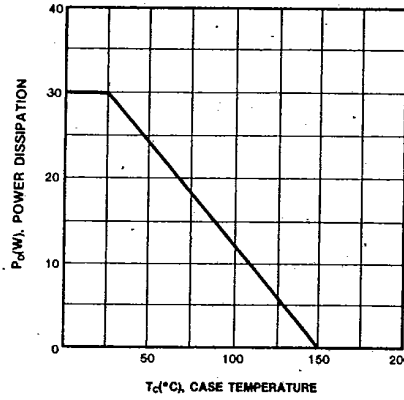
**DC CURRENT GAIN**



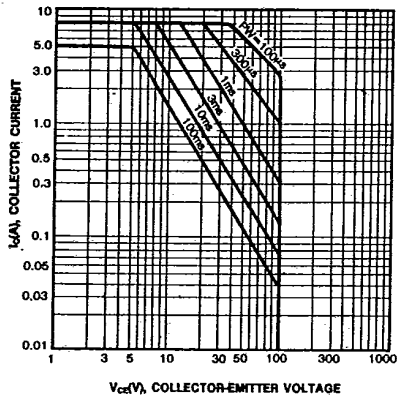
**BASE-EMITTER SATURATION VOLTAGE  
COLLECTOR-EMITTER SATURATION VOLTAGE**



**POWER DERATING**



**SAFE OPERATING AREA**



**KSD568****NPN EPITAXIAL SILICON TRANSISTOR**

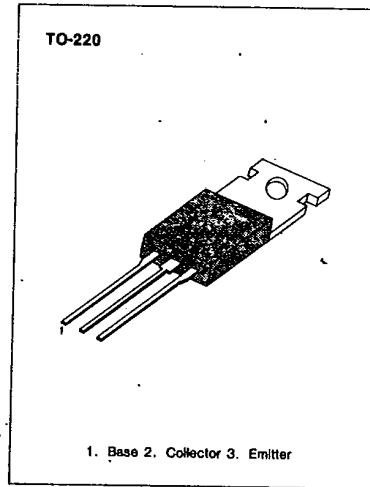
**LOW FREQUENCY POWER AMPLIFIER**  
**LOW SPEED SWITCHING**  
**INDUSTRIAL USE**

• 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  $\leq 10\%$



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**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	$\mu\text{A}$
Emitter Cutoff Current	$I_{EB0}$	$V_{EB}=5\text{V}, I_C=0$		10	$\mu\text{A}$
* 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	$V_{CE}(\text{sat})$	$I_C=5\text{A}, I_B=0.5\text{A}$		0.5	V
* Base-Emitter Saturation Voltage	$V_{BE}(\text{sat})$	$I_C=5\text{A}, I_B=0.5\text{A}$		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

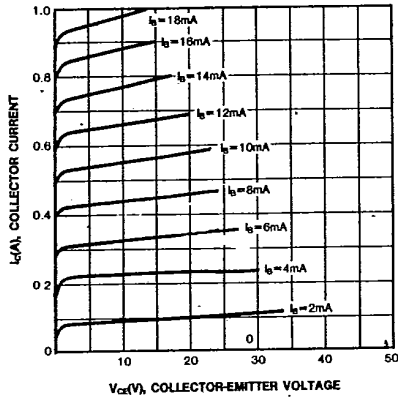


**KSD568**

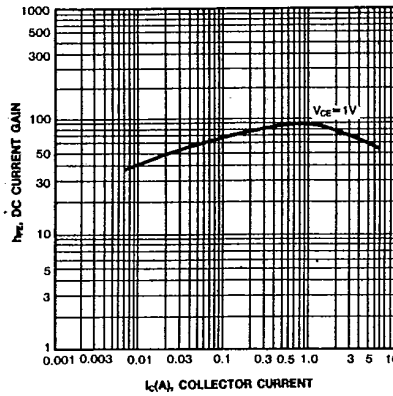
**NPN EPTAXIAL SILICON TRANSISTOR**

T-33-11

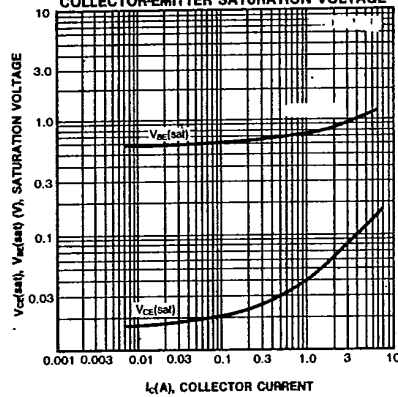
STATIC CHARACTERISTIC



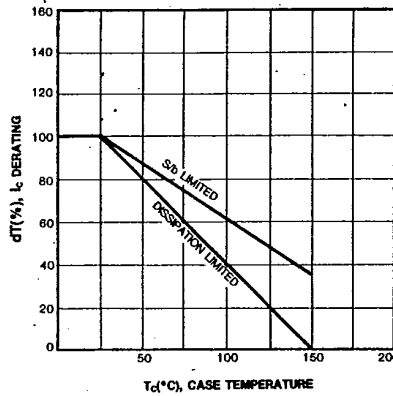
DC CURRENT GAIN



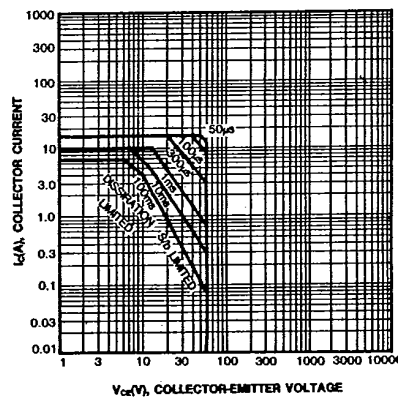
BASE-EMITTER SATURATION VOLTAGE  
COLLECTOR-EMITTER SATURATION VOLTAGE



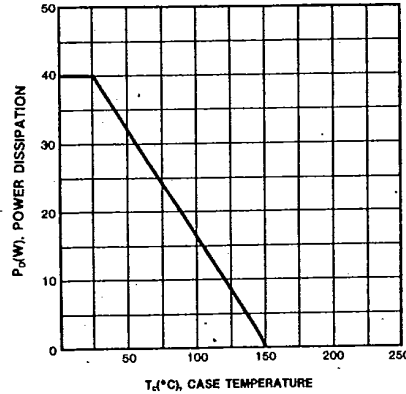
DERATING CURVE OF SAFE OPERATING AREAS



FORWARD BIAS SAFE OPERATING AREA



POWER DERATING



**KSD569****NPN EPITAXIAL SILICON TRANSISTOR**

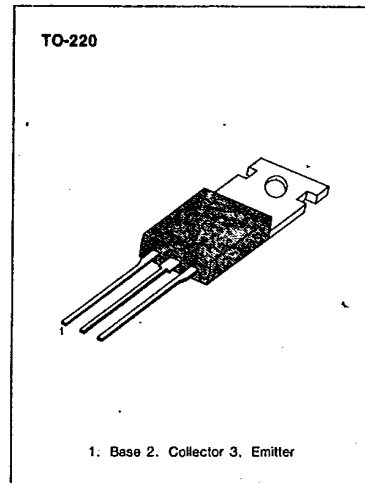
T-33-11

**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	$T_{stg}$	-55~150	$^\circ\text{C}$

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

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**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	$\mu\text{A}$
Emitter Cutoff Current	$I_{EBO}$	$V_{EB} = 5\text{V}$ , $I_C = 0$		10	$\mu\text{A}$
* 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	$V_{CE}(\text{sat})$	$I_C = 5\text{A}$ , $I_B = 0.5\text{A}$		0.5	V
* Base-Emitter Saturation Voltage	$V_{BE}(\text{sat})$	$I_C = 5\text{A}$ , $I_B = 0.5\text{A}$		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	60-120	100-200

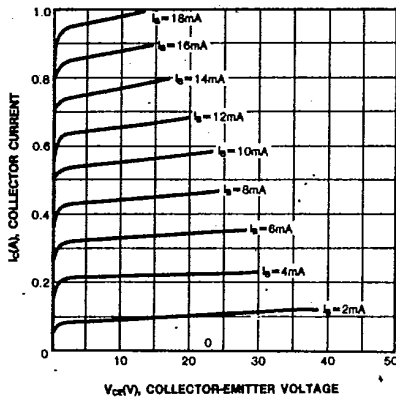


**KSD569**

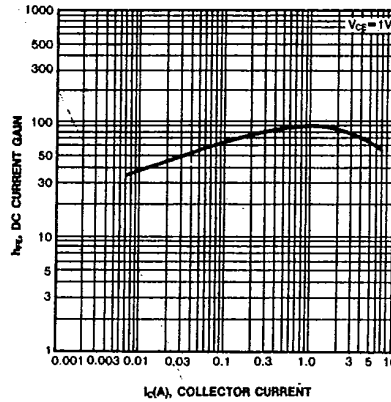
**NPN EPITAXIAL SILICON TRANSISTOR**

T-33-11

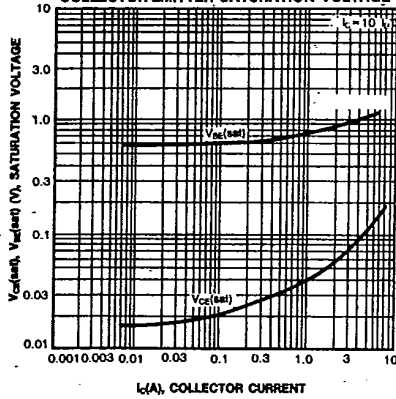
**STATIC CHARACTERISTIC**



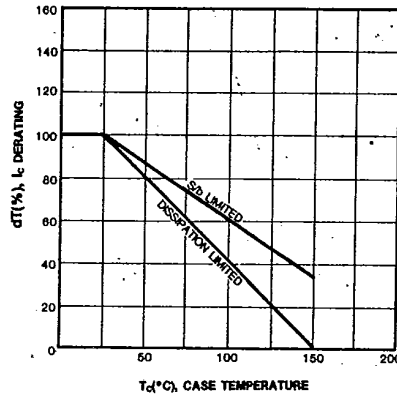
**DC CURRENT GAIN**



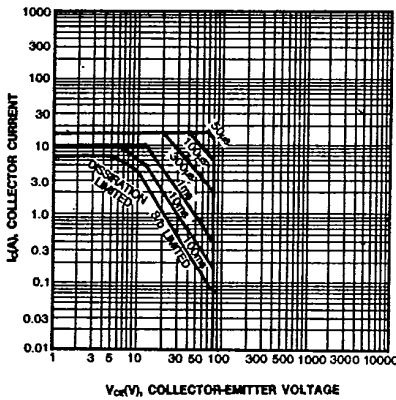
**BASE-EMITTER SATURATION VOLTAGE  
COLLECTOR-EMITTER SATURATION VOLTAGE**



**DERATING CURVE OF SAFE OPERATING AREAS**



**FORWARD BIAS SAFE OPERATING AREA**



**POWER DERATING**

