

SAMSUNG SEMICONDUCTOR INC

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KSA636

PNP EPITAXIAL SILICON TRANSISTOR

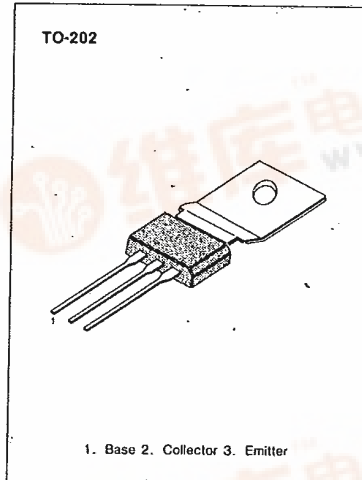
T-33-17

LOW FREQUENCY POWER AMPLIFIER

- Complement to KSC1098
- High Collector-Base Voltage $V_{CBO} = -70V$
- Collector Current $I_C = -2A$
- Collector Dissipation $P_C = 10W$ ($T_C = 25^\circ C$)

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

Characteristic	Symbol	Rating	Unit
Collector-Base Voltage	V_{CBO}	-70	V
Collector-Emitter Voltage	V_{CEO}	-45	V
Emitter-Base Voltage	V_{EBO}	-5	V
Collector Current	I_C	-2.0	A
Collector Dissipation ($T_C = 25^\circ C$)	P_C	10	W
Junction Temperature	T_J	150	$^\circ C$
Storage Temperature	T_{stg}	-55 ~ +150	$^\circ C$



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

Characteristic	Symbol	Test Conditions	Min	Typ	Max	Unit
Collector-Base Breakdown Voltage	BV_{CBO}	$I_C = -500\mu A, I_E = 0$	-70			V
Collector-Emitter Breakdown Voltage	BV_{CEO}	$I_C = -10mA, I_B = 0$	-45			V
Emitter-Base Breakdown Voltage	BV_{EBO}	$I_E = -500\mu A, I_C = 0$	-5			V
Collector Cut-off Current	I_{CBO}	$V_{CB} = -40V, I_E = 0$			-1	μA
DC Current Gain	h_{FE}	$V_{CE} = -5V, I_C = -0.5A$	40		240	
Collector-Emitter Saturation Voltage	$V_{CE(sat)}$	$I_C = -1A, I_B = -0.1A$		-0.15	-0.7	V

h_{FE} CLASSIFICATION

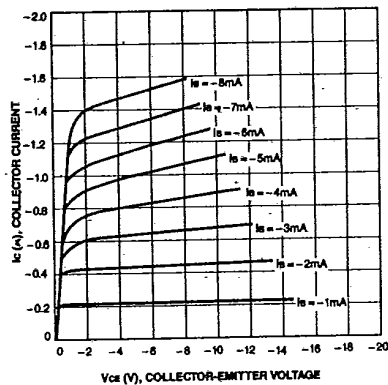
Classification	R	O	Y
h_{FE}	40-80	70-140	120-240

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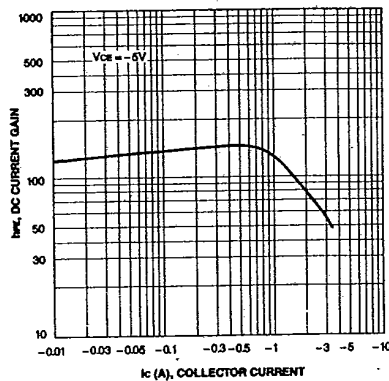
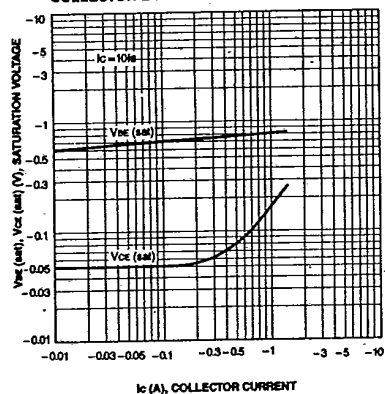
PNP EPITAXIAL SILICON TRANSISTOR

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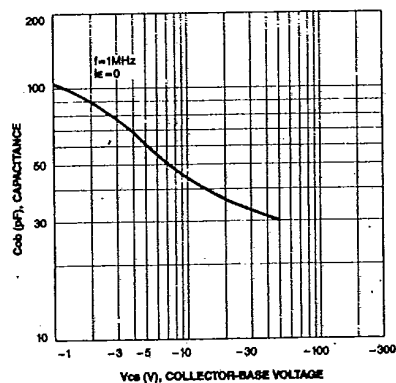
STATIC CHARACTERISTIC



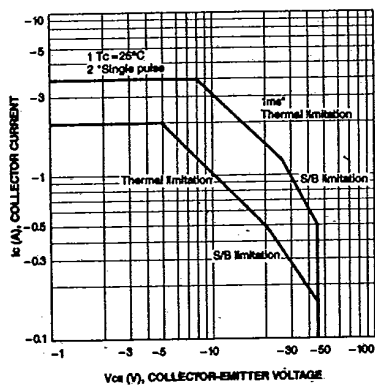
DC CURRENT GAIN

BASE-EMITTER SATURATION VOLTAGE
COLLECTOR-EMITTER SATURATION VOLTAGE

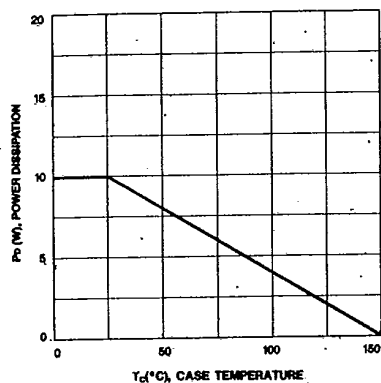
COLLECTOR OUTPUT CAPACITANCE



SAFE OPERATING AREA



POWER DERATING



KSA940**PNP EPITAXIAL SILICON TRANSISTOR**

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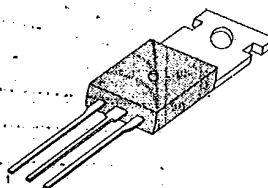
**POWER AMPLIFIER
VERTICAL DEFLECTION OUTPUT**

• Complement to KSC2073

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

Characteristic	Symbol	Rating	Unit
Collector-Base Voltage	V_{CB0}	-150	V
Collector-Emitter Voltage	V_{CE0}	-150	V
Emitter-Base Voltage	V_{EB0}	-5	V
Collector Current	I_C	-1.5	A
Base Current	I_B	-0.5	A
Collector Dissipation ($T_a=25^\circ\text{C}$)	P_C	1.5	W
Collector Dissipation ($T_a=25^\circ\text{C}$)	P_C	25	W
Junction Temperature	T_J	150	$^\circ\text{C}$
Storage Temperature	T_{stg}	-55~150	$^\circ\text{C}$

TO-220



1. Base 2. Collector 3. Emitter

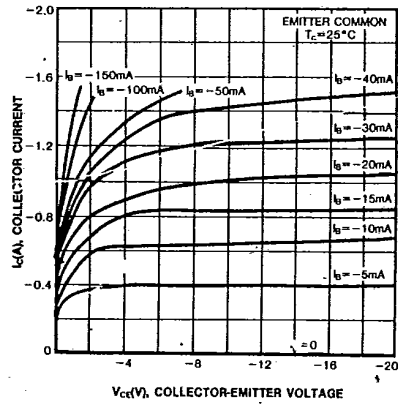
ELECTRICAL CHARACTERISTICS ($T_c=25^\circ\text{C}$)

Characteristic	Symbol	Test Condition	Min	Typ	Max	Unit
Collector Cutoff Current	I_{CBO}	$V_{CB}=-120\text{V}, I_E=0$			-10	μA
Emitter Cutoff Current	I_{EBO}	$V_{EB}=-5\text{V}, I_C=0$			-10	μA
DC Current Gain	h_{FE}	$V_{CE}=-10\text{V}, I_C=-500\text{mA}$	40	75	140	
Collector-Emitter Saturation Voltage	$V_{CE(sat)}$	$I_C=-500\text{mA}, I_B=-50\text{mA}$			-1.5	V
Base-Emitter On Voltage	$V_{BE(on)}$	$V_{CE}=-10\text{V}, I_C=-500\text{mA}$	-0.65	-0.75	-0.85	V
Current Gain-Bandwidth Product	f_T	$V_{CE}=-10\text{V}, I_C=-500\text{mA}$		4		MHz
Output Capacitance	C_{ob}	$V_{CB}=-10\text{V}, I_E=0$ $f=1\text{MHz}$		55		pF

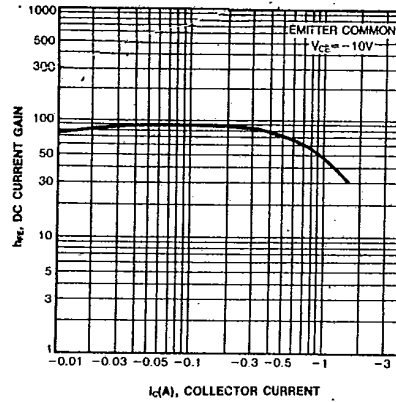


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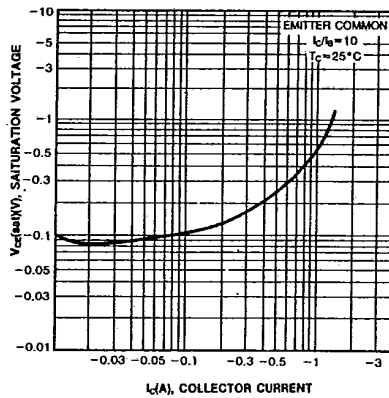
STATIC CHARACTERISTIC



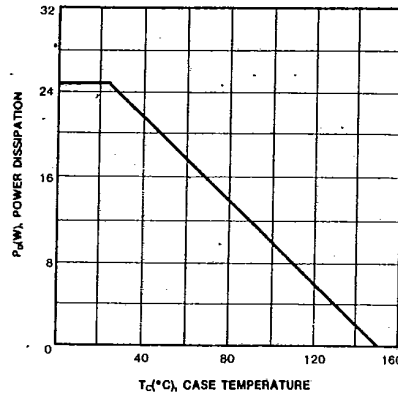
DC CURRENT GAIN



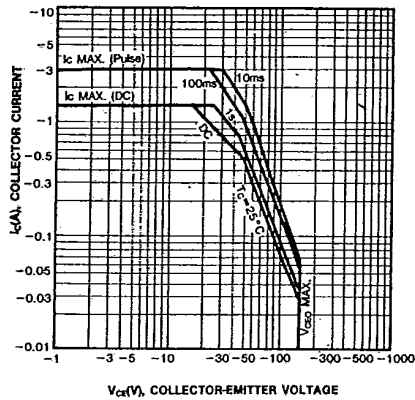
COLLECTOR-EMITTER SATURATION VOLTAGE



POWER DERATING



SAFE OPERATION AREA



3



KSA1010**PNP EPITAXIAL SILICON TRANSISTOR****HIGH SPEED HIGH VOLTAGE SWITCHING
INDUSTRIAL USE**

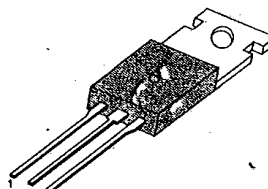
• Complement to KSC2334

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

Characteristic	Symbol	Rating	Unit
Collector-Base Voltage	V_{CB0}	-100	V
Collector-Emitter Voltage	V_{CEO}	-100	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}	-95~150	$^\circ\text{C}$

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

TO-220



1. Base 2. Collector 3. Emitter

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

Characteristic	Symbol	Test Condition	Min	Max	Unit
Collector Emitter Sustaining Voltage	$V_{CEO}(\text{sus})$	$I_C = -5\text{A}$, $I_B1 = -0.5\text{A}$, $L = 1\text{mH}$	-100		V
Collector Emitter Sustaining Voltage	$V_{CEX}(\text{sus})1$	$I_C = -5\text{A}$, $I_B1 = -I_B2 = -0.5\text{A}$ $V_{BE}(\text{off}) = 5\text{V}$, $L = 180\mu\text{H}$ Clamped	-100		V
Collector Emitter Sustaining Voltage	$V_{CEX}(\text{sus})2$	$I_C = -10\text{A}$, $I_B1 = -1\text{A}$ $I_B2 = 0.5\text{A}$, $V_{BE}(\text{off}) = 5\text{V}$ $L = 180\mu\text{H}$, Clamped	-100		V
Collector Cutoff Current	I_{CB0}	$V_{CB} = -100\text{V}$, $I_E = 0$		-10	μA
Collector Cutoff Current	I_{CER}	$V_{CE} = -100\text{V}$, $R_{BE} = 51\Omega$ $T_a = 125^\circ\text{C}$		-1	mA
Collector Cutoff Current	I_{CEX1}	$V_{CE} = -100\text{V}$, $V_{BE}(\text{off}) = 1.5\text{V}$		-10	μA
Collector Cutoff Current	I_{CEX2}	$V_{CE} = -100\text{V}$, $V_{BE}(\text{off}) = 1.5\text{V}$ $T_a = 125^\circ\text{C}$		-1	mA
Emitter Cutoff Current	I_{EB0}	$V_{EB} = -5\text{V}$, $I_C = 0$		-10	μA
*DC Current Gain	h_{FE1}	$V_{CE} = -5\text{V}$, $I_C = -0.5\text{A}$	40	200	
	h_{FE2}	$V_{CE} = -5\text{V}$, $I_C = -3\text{A}$	40	200	
	h_{FE3}	$V_{CE} = -5\text{V}$, $I_C = -5\text{A}$	20		
*Collector-Emitter Saturation Voltage	$V_{CE}(\text{sat})$	$I_C = -5\text{A}$, $I_B = -0.5\text{A}$		-0.6	V
*Base-Emitter Saturation Voltage	$V_{BE}(\text{sat})$	$I_C = -5\text{A}$, $I_B = -0.5\text{A}$		-1.5	V
Turn On Time	t_{on}	$I_C = -5\text{A}$, $R_L = 10\Omega$		0.5	μs
Storage Time	t_s	$I_B1 = -I_B2 = -0.5\text{A}$		1.5	μs
Fall Time	t_f	$V_{CC} = -50\text{V}$		0.5	μs

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

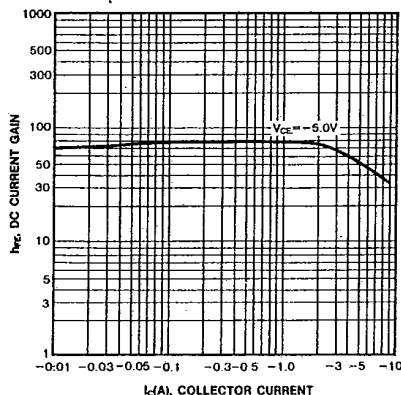
Classification	R	O	Y
h_{FE} (2)	40-80	60-120	100-200



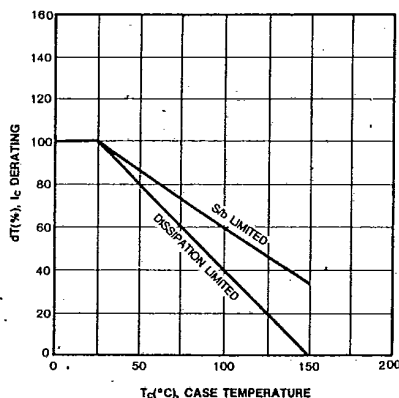
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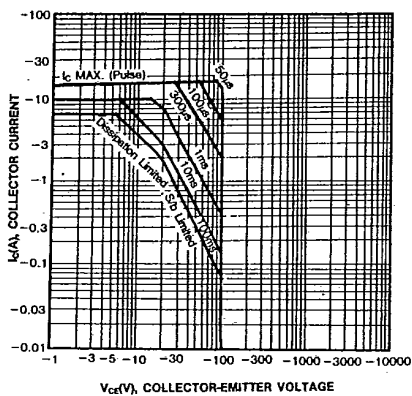
DC CURRENT GAIN



DERATING CURVE OF SAFE OPERATING AREAS



SAFE OPERATING AREA



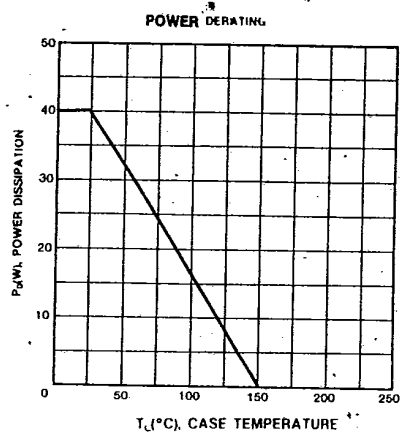
SAMSUNG SEMICONDUCTOR INC

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