

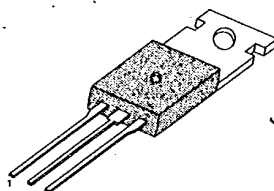
KSC2073**NPN EPITAXIAL SILICON TRANSISTOR****TV VERTICAL DEFLECTION OUTPUT**

- Complement to KSA940
- Collector-Base Voltage $V_{CBO}=150V$

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

Characteristic	Symbol	Rating	Unit
Collector-Base Voltage	V_{CBO}	150	V
Collector-Emitter Voltage	V_{CEO}	150	V
Emitter-Base Voltage	V_{EBO}	5	V
Collector Current	I_C	1.5	A
Collector Dissipation ($T_c=25^\circ C$)	P_C	25	W
Junction Temperature	T_j	150	$^\circ C$
Storage Temperature	T_{stg}	-55 ~ 150	$^\circ C$

TO-220



1. Base 2. Collector 3. Emitter

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

Characteristic	Symbol	Test Conditions	Min	Typ	Max	Unit
Collector-Base Breakdown Voltage	BV_{CBO}	$I_C=500\mu A, I_E=0$	150			V
Collector-Emitter Breakdown Voltage	BV_{CEO}	$I_C=10mA, I_B=0$	150			V
Emitter-Base Breakdown Voltage	BV_{EBO}	$I_E=500\mu A, I_C=0$	5			V
Collector Cutoff Current	I_{CBO}	$V_{CB}=120V, I_E=0$			10	μA
DC Current Gain	h_{FE}	$V_{CE}=10V, I_C=0.5A$	40	75	140	
Collector-Emitter Saturation Voltage	$V_{CE(sat)}$	$I_C=500mA, I_B=50mA$			1	V
Current Gain Bandwidth Product	f_T	$V_{CE}=10V, I_C=0.5A$		4		MHz
Output Capacitance	C_{ob}	$V_{CB}=10V, I_E=0, f=1MHz$		50		pF

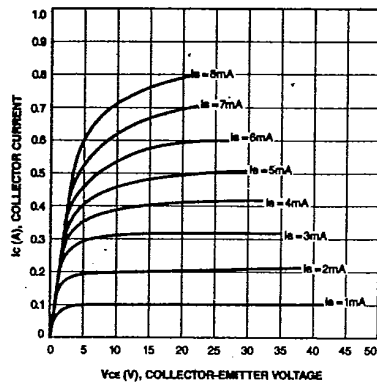


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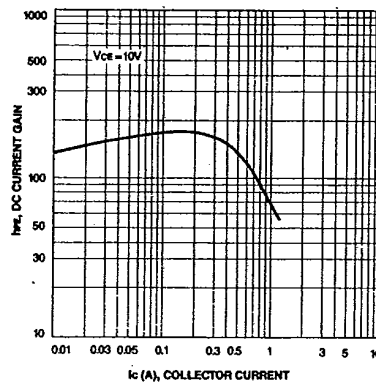
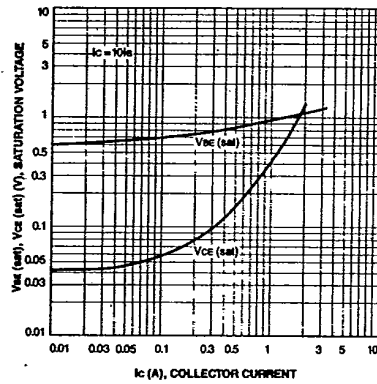
NPN EPITAXIAL SILICON TRANSISTOR

T-33-09

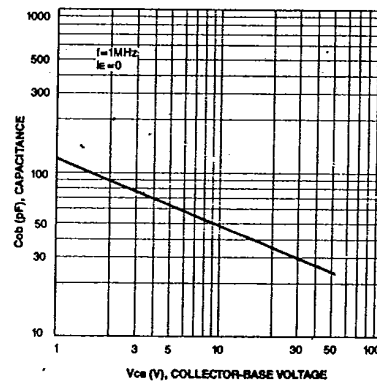
STATIC CHARACTERISTIC



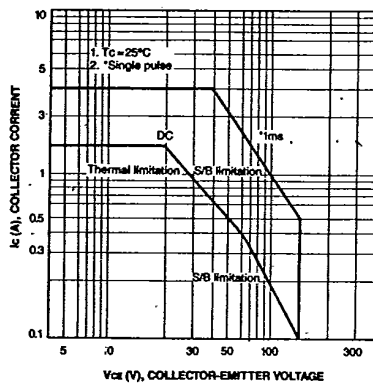
DC CURRENT GAIN

BASE-EMITTER SATURATION VOLTAGE
COLLECTOR-EMITTER SATURATION VOLTAGE

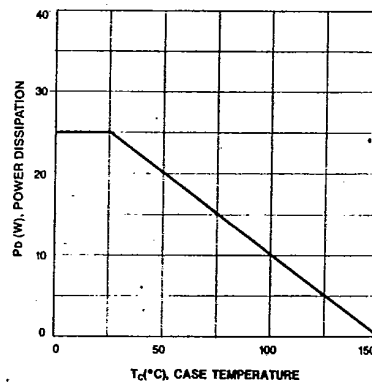
COLLECTOR OUTPUT CAPACITANCE



SAFE OPERATING AREA



POWER DERATING



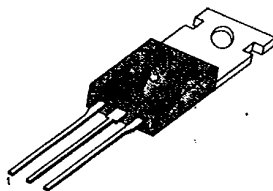
KSC2233**NPN EPITAXIAL SILICON TRANSISTOR****B/W TV HORIZONTAL DEFLECTION OUTPUT**

- Collector-Base Voltage: $V_{CB0} = 200V$
- Collector Current (D.C): $I_C = 4A$
- Collector Dissipation: $P_C = 40W$

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

Characteristic	Symbol	Rating	Unit
Collector-Base Voltage	V_{CB0}	200	V
Collector-Emitter Voltage	V_{CEO}	60	V
Emitter-Base Voltage	V_{EB0}	5	V
Collector Current	I_C	4	A
Collector Dissipation ($T_C = 25^\circ C$)	P_C	40	W
Junction Temperature	T_J	150	$^\circ C$
Storage Temperature	T_{stg}	-55 ~ +150	$^\circ C$

TO-220



1. Base 2. Collector 3. Emitter

3

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

Characteristic	Symbol	Test Conditions	Min	Typ	Max	Unit
Collector-Base Breakdown Voltage	BV_{CBO}	$I_C = 1mA, I_E = 0$	200			V
Collector-Emitter Breakdown Voltage	BV_{CEO}	$I_C = 20mA, I_B = 0$	60			V
Emitter-Base Breakdown Voltage	BV_{EBO}	$I_E = -1mA, I_C = 0$	5			V
Collector Cut-off Current	I_{CBO}	$V_{CB} = 170V, I_E = 0$			10	μA
DC Current Gain	h_{FE1}	$V_{CE} = 5V, I_C = 1A$	30		150	
	h_{FE2}	$V_{CE} = 5V, I_C = 4A$	20	40		
Collector-Emitter Saturation Voltage	$V_{CE(sat)}$	$I_C = 4A, I_B = 0.4A$			1	V
Base-Emitter Saturation Voltage	$V_{BE(sat)}$	$I_C = 4A, I_B = 0.4A$			1.5	V
Current Gain-Band Width Product	f_T	$V_{CE} = 5V, I_C = 0.5A$		10		MHz

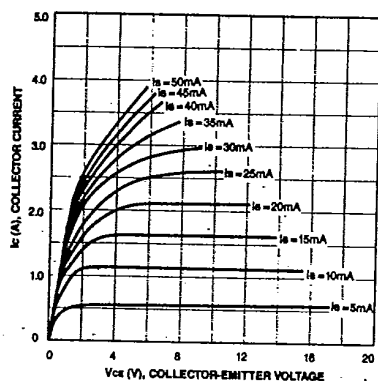


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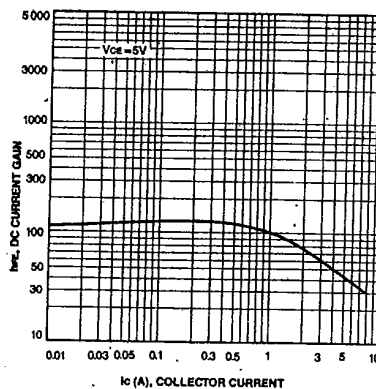
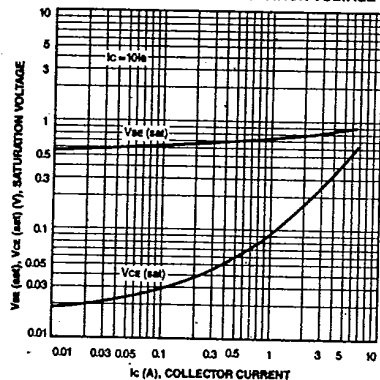
NPN EPITAXIAL SILICON TRANSISTOR

T-33-11

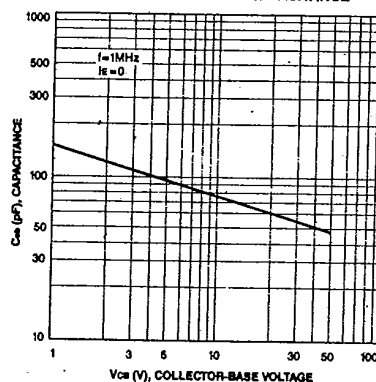
STATIC CHARACTERISTIC



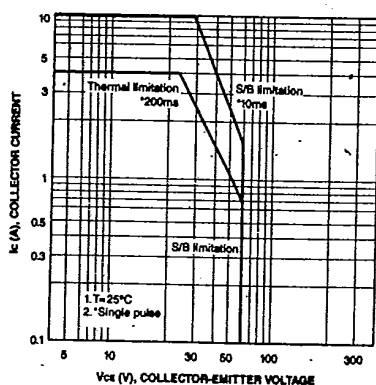
DC CURRENT GAIN

BASE-EMITTER SATURATION VOLTAGE
COLLECTOR-EMITTER SATURATION VOLTAGE

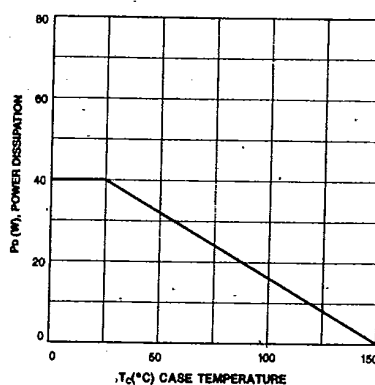
COLLECTOR OUTPUT CAPACITANCE



SAFE OPERATING AREA



POWER DERATING



KSC2333**NPN EPITAXIAL SILICON TRANSISTOR**

T-33-07

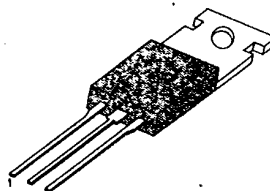
HIGH SPEED SWITCHING
LOW COLLECTOR SATURATION VOLTAGE
SPECIFIED OF REVERSE BIASED SOA
WITH INDUCTIVE LOADS

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

Characteristic	Symbol	Rating	Unit
Collector-Base Voltage	V_{CB0}	500	V
Collector-Emitter Voltage	V_{CE0}	400	V
Emitter-Base Voltage	V_{EB0}	7	V
Collector Current (DC)	I_C	2	A
* Collector Current (Pulse)	I_C	4	A
Base Current (DC)	I_B	1	A
Collector Dissipation	P_C	15	W
Junction Temperature	T_J	150	$^\circ\text{C}$
Storage Temperature	T_{stg}	-55~150	$^\circ\text{C}$

* $PW \leq 350\mu\text{s}$, Duty Cycle $\leq 10\%$

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1. Base 2. Collector 3. Emitter

3

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

Characteristic	Symbol	Test Condition	Min	Max	Unit
Collector-Emitter Sustaining Voltage	$V_{CE0(sus)}$	$I_C = 0.5\text{A}$, $I_B = 0.1\text{A}$, $L = 1\text{mH}$	400		V
Collector-Emitter Sustaining Voltage	$V_{CE(sus)1}$	$I_C = 0.5\text{A}$, $I_{B1} = -I_{B2} = 0.1\text{A}$	450		V
Collector-Emitter Sustaining Voltage	$V_{CE(sus)2}$	$T_a = 125^\circ\text{C}$, $L = 180\mu\text{H}$, Clamped $I_C = 1\text{A}$, $I_{B1} = 0.2\text{A}$, $-I_{B2} = 0.2\text{A}$	400		V
Collector Cutoff Current	I_{CBO}	$V_{CB} = 400\text{V}$, $I_E = 0$		10	μA
Collector Cutoff Current	I_{CER}	$V_{CE} = 400\text{V}$, $R_{BE} = 51\Omega$, $T_a = 125^\circ\text{C}$		1	mA
Collector Cutoff Current	I_{CEX1}	$V_{CE} = 400\text{V}$, $V_{BE(off)} = -5\text{V}$		10	μA
Collector Cutoff Current	I_{CEX2}	$V_{CE} = 400\text{V}$, $V_{BE(off)} = -5\text{V}$		1	mA
Emitter Cutoff Current	I_{EBO}	$T_a = 125^\circ\text{C}$ $V_{EB} = 5\text{V}$, $I_C = 0$		10	μA
* DC Current Gain	h_{FE1}	$V_{CE} = 5\text{V}$, $I_C = 0.1\text{A}$	20	80	
	h_{FE2}	$V_{CE} = 5\text{V}$, $I_C = 0.5\text{A}$	10		
* Collector-Emitter Saturation Voltage	$V_{CE(sat)}$	$I_C = 0.5\text{A}$, $I_B = 0.1\text{A}$		1	V
* Base-Emitter Saturation Voltage	$V_{BE(sat)}$	$I_C = 0.5\text{A}$, $I_B = 0.1\text{A}$		1.2	V
Turn On Time	t_{on}	$I_C = 0.5\text{A}$, $I_{B1} = -I_{B2} = 0.1\text{A}$		1	μs
Storage Time	t_{stg}	$R_L = 300\Omega$, $V_{CC} = 150\text{V}$		2.5	μs
Fall Time	t_f			1	μs

* Pulse Test: $PW \leq 350\mu\text{s}$, Duty Cycle $\leq 2\%$ Pulsed **h_{FE} (1) CLASSIFICATION**

Classification	R	O	Y
h_{FE1}	20-40	30-60	40-80



KSC2335**NPN EPITAXIAL SILICON TRANSISTOR**

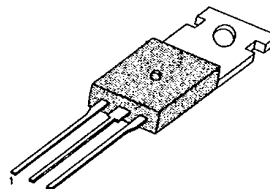
**HIGH SPEED, HIGH VOLTAGE SWITCHING
INDUSTRIAL USE**

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

Characteristic	Symbol	Rating	Unit
Collector-Base Voltage	V_{CBO}	500	V
Collector-Emitter Voltage	V_{CEO}	400	V
Emitter-Base Voltage	V_{EBO}	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 ($T_a=25^\circ\text{C}$)	P_C	1.5	W
Collector Dissipation ($T_c=25^\circ\text{C}$)	P_C	40	W
Junction Temperature	T_j	150	$^\circ\text{C}$
Storage Temperature	T_{stg}	-55~150	$^\circ\text{C}$

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

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1. Base 2. Collector 3. Emitter

3

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

Characteristic	Symbol	Test Condition	Min	Max	Unit
Collector Emitter Sustaining Voltage	$V_{CEO}(\text{sus})$	$I_C=3\text{A}$, $I_B1=0.6\text{A}$, $L=1\text{mH}$	400		V
Collector Emitter Sustaining Voltage	$V_{CEX}(\text{sus})1$	$I_C=3\text{A}$, $I_B1=-I_B2=0.6\text{A}$	450		V
Collector Emitter Sustaining Voltage	$V_{CEX}(\text{sus})2$	$V_{BE}(\text{off})=-5\text{V}$, $L=180\mu\text{H}$, Clamped $I_C=6\text{A}$, $I_B1=2\text{A}$, $I_B2=-0.6\text{A}$	400		V
Collector Cutoff Current	I_{CBO}	$V_{CB}=400\text{V}$, $I_E=0$		10	μA
Collector Cutoff Current	I_{CER}	$V_{CE}=400\text{V}$, $R_{BE}=51\Omega$, $T_a=125^\circ\text{C}$		1	mA
Collector Cutoff Current	I_{CEX1}	$V_{CE}=400\text{V}$, $V_{BE}(\text{off})=-1.5\text{V}$		10	μA
Collector Cutoff Current	I_{CEX2}	$V_{CE}=400\text{V}$, $V_{BE}(\text{off})=-1.5\text{V}$ $T_a=125^\circ\text{C}$		1	mA
Emitter Cutoff Current	I_{EBO}	$V_{EB}=5\text{V}$, $I_C=0$		10	μA
*DC Current Gain	h_{FE1}	$V_{CE}=5\text{V}$, $I_C=0.1\text{A}$	20	80	
	h_{FE2}	$V_{CE}=5\text{V}$, $I_C=1\text{A}$	20	80	
	h_{FE3}	$V_{CE}=5\text{V}$, $I_C=3\text{A}$	10		
*Collector-Emitter Saturation Voltage	$V_{CE}(\text{sat})$	$I_C=3\text{A}$, $I_B=0.6\text{A}$		1	V
*Base-Emitter Saturation Voltage	$V_{BE}(\text{sat})$	$I_C=3\text{A}$, $I_B=0.6\text{A}$		1.2	V
Turn On Time	t_{on}	$I_C=3\text{A}$, $R_L=50\Omega$		1	μs
Storage Time	t_s	$I_B1=-I_B2=0.6\text{A}$, $V_{CC}=150\text{V}$		2.5	μs
Fall Time	t_f			1	μs

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

Classification	R	O	Y
$h_{FE}(2)$	20-40	30-60	40-80

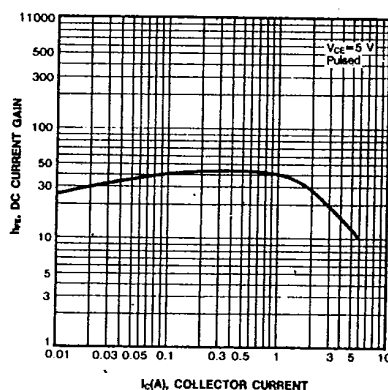


SAMSUNG SEMICONDUCTOR

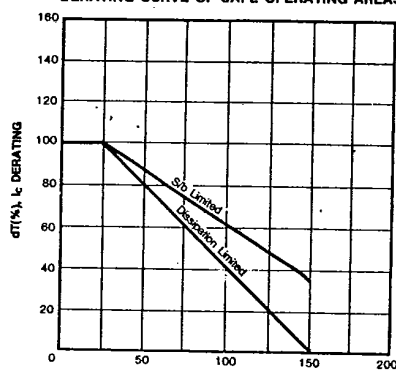
NPN EPITAXIAL SILICON TRANSISTOR

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DC CURRENT GAIN



DERATING CURVE OF SAFE OPERATING AREAS



Tc(°C), CASE TEMPERATURE

