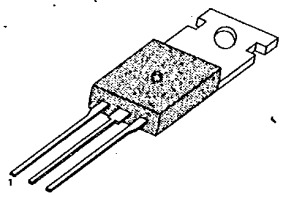
KSC2073 NPN EPITAXIAL SILICON TRANSISTOR

T-33-09

TV VERTICAL DEFLECTION OUTPUT

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

TO-220



1. Base 2. Collector 3. Emitter

ABSOLUTE MAXIMUM RATINGS (T_a=25°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°C)	P_C	25	W
Junction Temperature	Tj	150	°C
Storage Temperature	Tstg	−55 ~ 150	°C

3

ELECTRICAL CHARACTERISTICS (T_a=25°C)

Characteristic	Symbol	Test Conditions	Min	Typ	Max	Unit
Collector-Base Breakdown Voltage	BV_{CBO}	I_C=500μA, 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=500μA, 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	Cob	V_{CB}=10V, I_E=0, f=1MHz		50		pF

KSC2073 NPN EPITAXIAL SILICON TRANSISTOR

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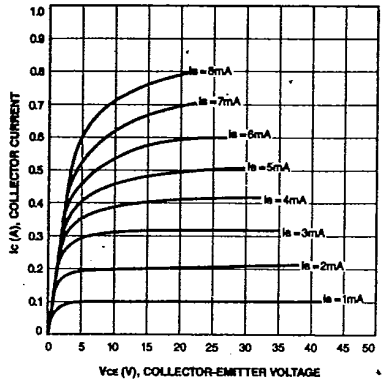
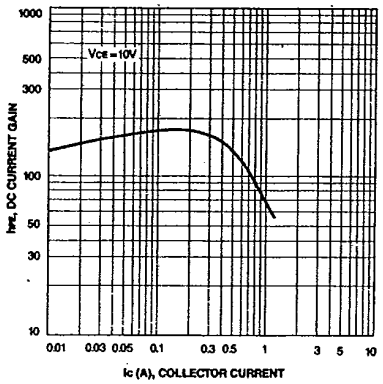
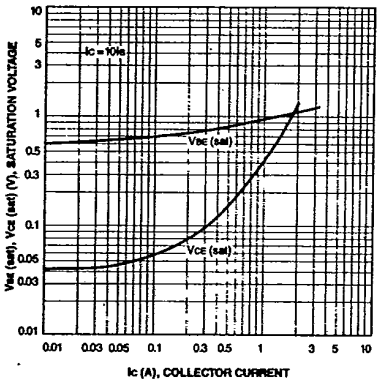
STATIC CHARACTERISTIC



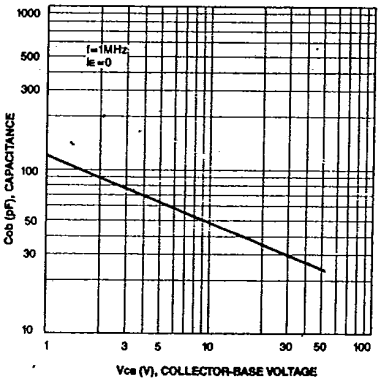
DC CURRENT GAIN



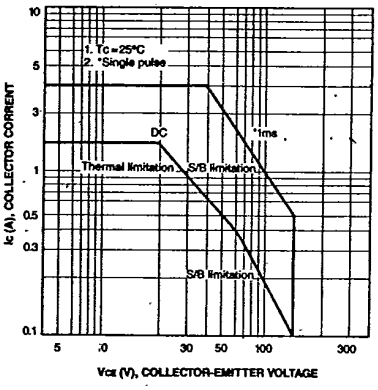
BASE-EMITTER SATURATION VOLTAGE
COLLECTOR-EMITTER SATURATION VOLTAGE



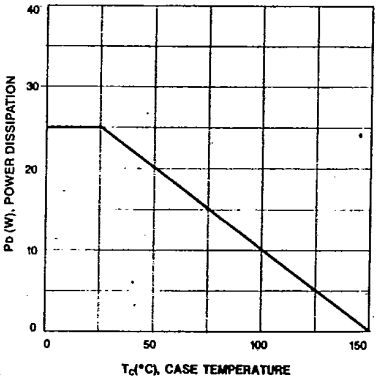
COLLECTOR OUTPUT CAPACITANCE



SAFE OPERATING AREA



POWER DERATING

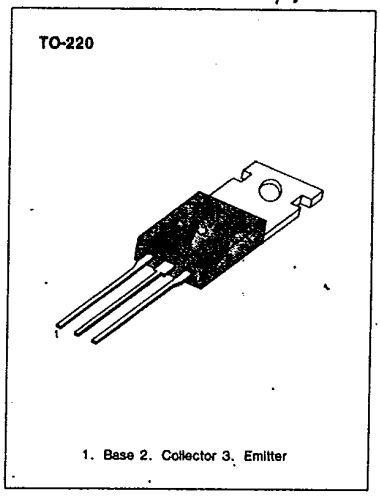


KSC2233 NPN EPITAXIAL SILICON TRANSISTOR

T-33-11

B/W TV HORIZONTAL DEFLECTION OUTPUT

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



ABSOLUTE MAXIMUM RATINGS (T_a=25°C)

Characteristic	Symbol	Rating	Unit
Collector-Base Voltage	V_{CBO}	200	V
Collector-Emitter Voltage	V_{CEO}	60	V
Emitter-Base Voltage	V_{EBO}	5	V
Collector Current	I_C	4	A
Collector Dissipation (T_C=25°C)	P_C	40	W
Junction Temperature	TJ	150	°C
Storage Temperature	Tstg	−55~+150	°C

3

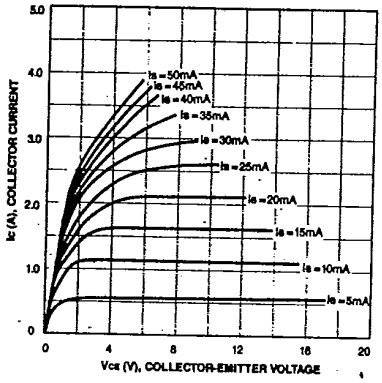
ELECTRICAL CHARACTERISTICS (T_a=25°C)

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	$h_{FE}1$	V_{CE}=5V, I_C=1A	30		150	
	$h_{FE}2$	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

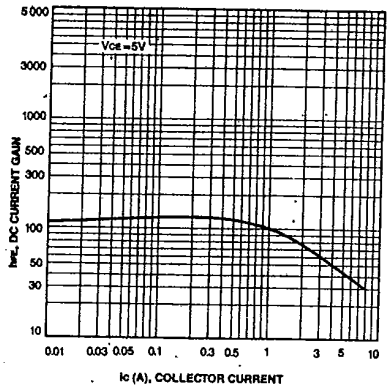
KSC2233 NPN EPITAXIAL SILICON TRANSISTOR

T-33-11

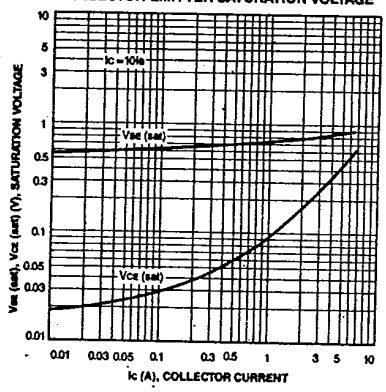
STATIC CHARACTERISTIC



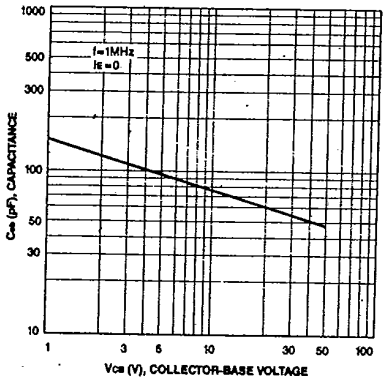
DC CURRENT GAIN



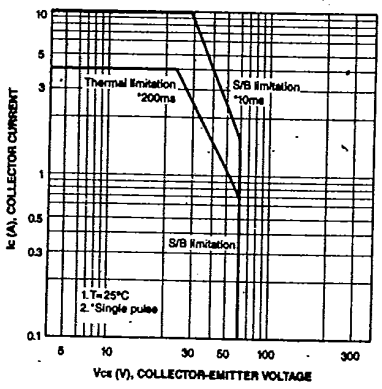
BASE-EMITTER SATURATION VOLTAGE
COLLECTOR-EMITTER SATURATION VOLTAGE



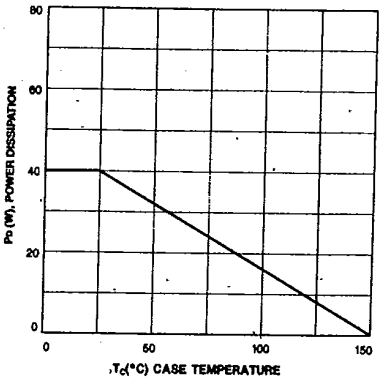
COLLECTOR OUTPUT CAPACITANCE



SAFE OPERATING AREA



POWER DERATING

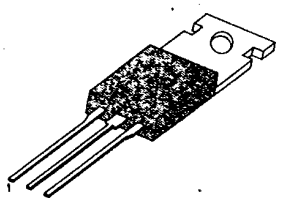


KSC2333 NPN EPITAXIAL SILICON TRANSISTOR

T-33-07

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

TO-220



1. Base 2. Collector 3. Emitter

3

ABSOLUTE MAXIMUM RATINGS (T_a=25°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	2	A
*Collector Current (Pulse)	I_C	4	A
Base Current (DC)	I_B	1	A
Collector Dissipation	P_C	15	W
Junction Temperature	Tj	150	°C
Storage Temperature	Tstg	−55~150	°C

* PW≤350μs, Duty Cycle ≤10%

ELECTRICAL CHARACTERISTICS (T_a=25°C)

Characteristic	Symbol	Test Condition	Min	Max	Unit
Collector-Emitter Sustaining Voltage	V_{CEO}(sus)	I_C=0.5A, I_B=0.1A, L=1mH	400		V
Collector-Emitter Sustaining Voltage	V_{CEX}(sus)1	I_C=0.5A, I_{B1}=−I_{B2}=0.1A T_a=125°C, L=180μH, Clamped	450		V
Collector-Emitter Sustaining Voltage	V_{CEX}(sus)2	I_C=1A, I_{B1}=0.2A, −I_{B2}=0.2A T_a=125°C, L=180μH, Clamped	400		V
Collector Cutoff Current	I_{CBO}	V_{CB}=400V, I_E=0		10	μA
Collector Cutoff Current	I_{CER}	V_{CE}=400V, R_{BE}=51Ω, T_a=125°C		1	mA
Collector Cutoff Current	I_{CEX}1	V_{CE}=400V, V_{BE}(off)=−5V		10	μA
Collector Cutoff Current	I_{CEX}2	V_{CE}=400V, V_{BE}(off)=−5V T_a=125°C		1	mA
Emitter Cutoff Current	I_{EBO}	V_{EB}=5V, I_C=0		10	μA
*DC Current Gain	h_{FE}1	V_{CE}=5V, I_C=0.1A	20	80	
	h_{FE}2	V_{CE}=5V, I_C=0.5A	10		
*Collector-Emitter Saturation Voltage	V_{CE}(sat)	I_C=0.5A, I_B=0.1A		1	V
*Base-Emitter Saturation Voltage	V_{BE}(sat)	I_C=0.5A, I_B=0.1A		1.2	V
Turn On Time	ton	I_C=0.5A, I_{B1}=−I_{B2}=0.1A		1	μS
Storage Time	tstg	RL=300Ω, V_{CC}=150V		2.5	μS
Fall Time	tf			1	μS

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

h_{FE} (1) CLASSIFICATION

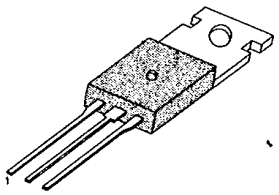
Classification	R	O	Y
h_{FE}1	20-40	30-60	40-80

KSC2335 NPN EPITAXIAL SILICON TRANSISTOR

T-33-11

HIGH SPEED, HIGH VOLTAGE SWITCHING INDUSTRIAL USE

TO-220



1. Base 2. Collector 3. Emitter

3

ABSOLUTE MAXIMUM RATINGS (T_a=25°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°C)	P_C	1.5	W
Collector Dissipation (T_c=25°C)	P_C	40	W
Junction Temperature	Tj	150	°C
Storage Temperature	Tstg	−55~150	°C

* PW≤300μs, Duty Cycle ≤10%

ELECTRICAL CHARACTERISTICS (T_a=25°C)

Characteristic	Symbol	Test Condition	Min	Max	Unit
Collector Emitter Sustaining Voltage	V_{CEO} (sus)	I_C=3A, I_B1=0.6A, L=1mH	400		V
Collector Emitter Sustaining Voltage	V_{CEX} (sus)1	I_C=3A, I_B1=−I_B2=0.6A, V_{BE} (off)=−5V, L=180μH, Clamped	450		V
Collector Emitter Sustaining Voltage	V_{CEX} (sus)2	I_C=6A, I_B1=2A, I_B2=−0.6A, V_{BE} (off)=−5V, L=180μH, Clamped	400		V
Collector Cutoff Current	I_{CBO}	V_{CB}=400V, I_E=0		10	μA
Collector Cutoff Current	I_{CER}	V_{CE}=400V, R_{BE}=51Ω, T_a=125°C		1	mA
Collector Cutoff Current	I_{CEX}1	V_{CE}=400V, V_{BE} (off)=−1.5V		10	μA
Collector Cutoff Current	I_{CEX}2	V_{CE}=400V, V_{BE} (off)=−1.5V, T_a=125°C		1	mA
Emitter Cutoff Current	I_{EBO}	V_{EB}=5V, I_C=0		10	μA
*DC Current Gain	h_{FE1}	V_{CE}=5V, I_C=0.1A	20	80	
	h_{FE2}	V_{CE}=5V, I_C=1A	20	80	
	h_{FE3}	V_{CE}=5V, I_C=3A	10		
*Collector-Emitter Saturation Voltage	V_{CE} (sat)	I_C=3A, I_B=0.6A		1	V
*Base-Emitter Saturation Voltage	V_{BE} (sat)	I_C=3A, I_B=0.6A		1.2	V
Turn On Time	ton	I_C=3A, RL=50Ω		1	μs
Storage Time	ts	I_B1=−I_B2=0.6A, V_{CC}=150V		2.5	μs
Fall Time	tf			1	μs

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

h_{FE} (2) CLASSIFICATION

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

KSC2335 NPN EPITAXIAL SILICON TRANSISTOR

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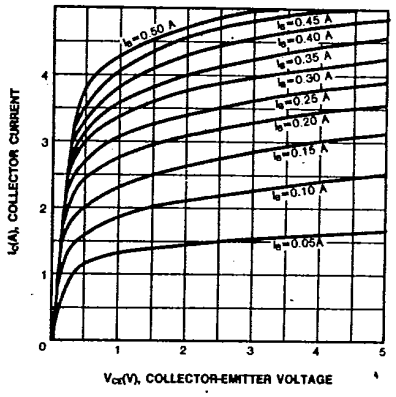
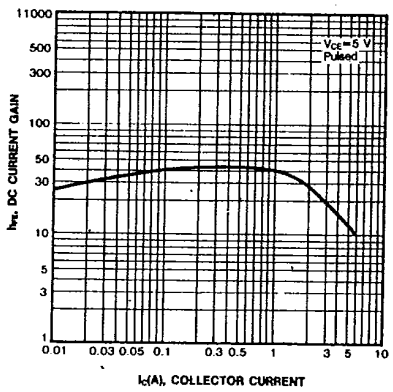
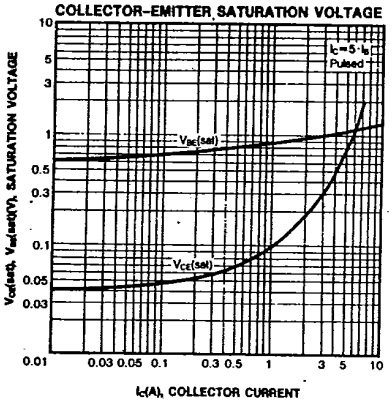
STATIC CHARACTERISTIC



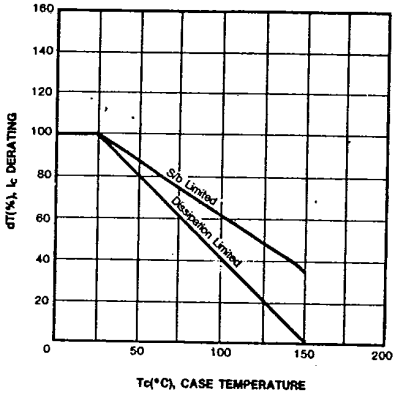
DC CURRENT GAIN



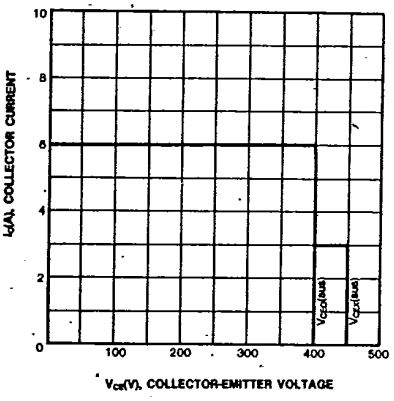
BASE-EMITTER SATURATION VOLTAGE
COLLECTOR-EMITTER SATURATION VOLTAGE



DERATING CURVE OF SAFE OPERATING AREAS



REVERSE BIAS SAFE OPERATING AREA



SAFE OPERATING AREA