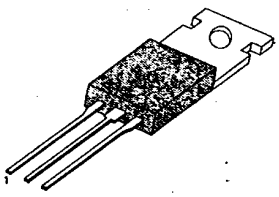
KSC5020 NPN SILICON TRANSISTOR

T-33-11

HIGH VOLTAGE, HIGH QUALITY

HIGH SPPED SWITCHING: t_f=0.1μS
• WIDE SOA

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}	800	V
Collector-Emitter Voltage	V_{CEO}	500	V
Emitter-Base Voltage	V_{EBO}	7	V
Collector Current (DC)	I_C	3	A
Collector Current (Pulse)	I_C	6	A
Base Current (DC)	I_B	1	A
Collector Dissipation	P_C	40	W
Junction Temperature	Tj	150	°C
Storage Temperature	Tstg	−55~150	°C

ELECTRICAL CHARACTERISTICS (T_a=25°C)

Characteristic	Symbol	Test Condition	Min	Typ	Max	Unit
Collector Base Breakdown Voltage	BV_{CBO}	I_C=1mA, I_E=0	800			V
Collector Emitter Breakdown Voltage	BV_{CEO}	I_C=5mA, R_{BE}=∞	500			V
Emitter Base Breakdown Voltage	BV_{EBO}	I_E=1mA, I_C=0	7			V
Collector Emitter Sustaning Voltage	V_{CEX}(sus)	I_C=1.5A, I_{B1}=−I_{B2}=0.6A L=2mH, Clamped	500			V
Collector Cutoff Current	I_{CBO}	V_{CB}=500V, I_E=0			10	μA
Emitter Cutoff Current	I_{EBO}	V_{EB}=5V, I_C=0			10	μA
DC Current Gain	h_{FE}1	V_{CE}=5V, I_C=0.3A	15		50	
	h_{FE}2	V_{CE}=5V, I_C=1.5A	8			
Collector Emitter Saturation Voltage	V_{CE}(sat)	I_C=1.5A, I_B=0.3A			1	V
Base Emitter Saturation Voltage	V_{BE}(sat)	I_C=1.5A, I_B=0.3A			1.5	V
Output Capacitance	C_{OB}	V_{CB}=10V, f=1MHz		50		pF
Current Gain Bandwidth Product	f_T	V_{CE}=10V, I_C=0.3A		18		MHz
Turn On Time	t_{on}	V_{CC}=200V			0.5	μS
Storage Time	t_S	5I_{B1}=−2.5I_{B2}=I_C=2A			3	μS
Fall Time	t_f	RL=100ohm			0.3	μS

h_{FE} CLASSIFICATION

Classification	R	O	Y
h_{FE}1	15-30	20-40	30-50

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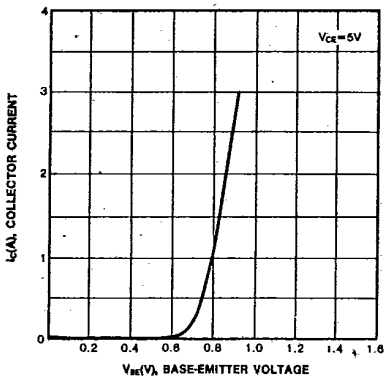
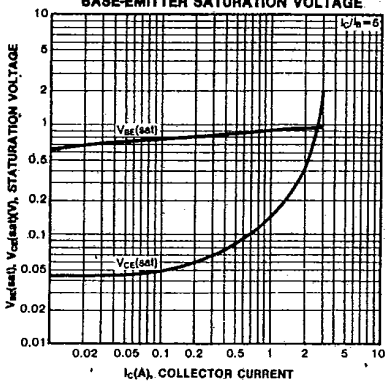
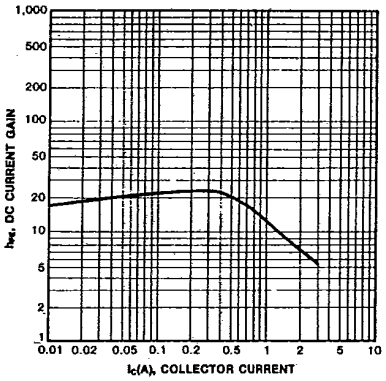
BASE-EMITTER ON VOLTAGE



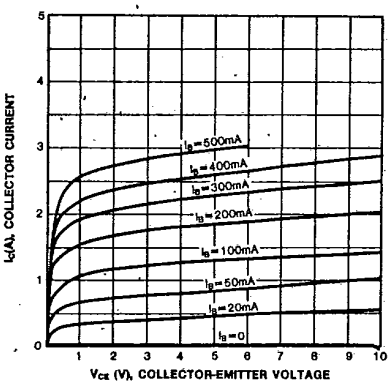
COLLECTOR-EMITTER SATURATION VOLTAGE
BASE-EMITTER SATURATION VOLTAGE



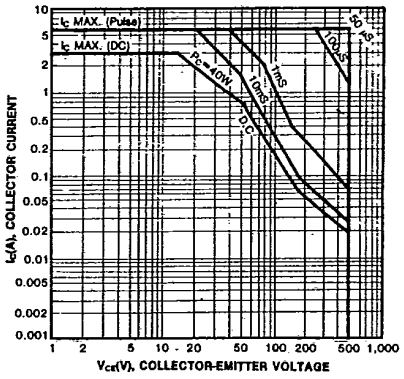
DC CURRENT GAIN



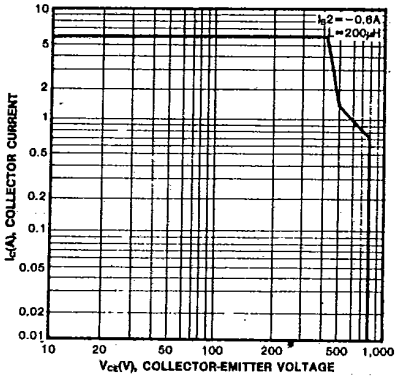
STATIC CHARACTERISTIC



FORWARD BIAS SAFE OPERATING AREA



REVERSE BIAS SAFE OPERATING AREA



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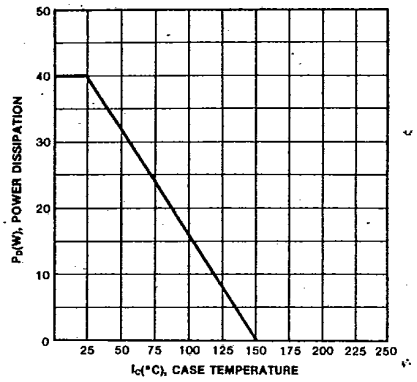
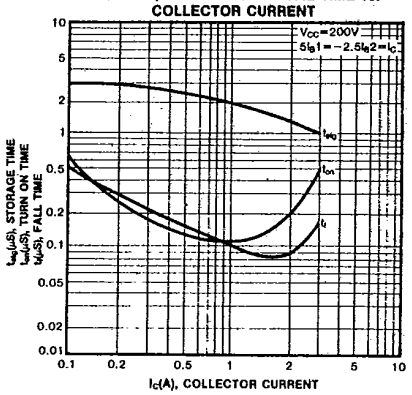
POWER DERATING



TURN ON, STORAGE AND FALL TIME vs. COLLECTOR CURRENT



3

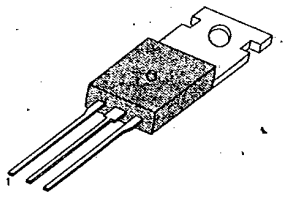
KSC5021 NPN SILICON TRANSISTOR

T-33-11

HIGH VOLTAGE AND HIGH RELIABILITY

HIGH SPEED SWITCHING: t_f = 0.1 μS (Typ)
WIDE SOA

TO-220



1. Base 2. Collector 3. Emitter

ABSOLUTE MAXIMUM RATINGS (T_a=25°C)

Characteristic	Symbol	Rating	Unit
Collector-Base Voltage	V_{CBO}	800	V
Collector-Emitter Voltage	V_{CEO}	500	V
Emitter-Base Voltage	V_{EBO}	7	V
Collector Current (DC)	I_C	5	A
Collector Current (Pulse)	I_C	10	A
Base Current	I_B	2	A
Collector Dissipation	P_C	50	W
Junction Temperature	Tj	150	°C
Storage Temperature	Tstg	−55~150	°C

ELECTRICAL CHARACTERISTICS (T_a=25°C)

Characteristic	Symbol	Test Condition	Min	Typ	Max	Unit
Collector Base Breakdown Voltage	BV_{CBO}	I_C=1mA, I_E=0	800			V
Collector Emitter Breakdown Voltage	BV_{CEO}	I_C=5mA, R_{BE}=∞	500			V
Emitter Base Breakdown Voltage	BV_{EBO}	I_E=1mA, I_C=0	7			V
Collector Emitter Sustaining Voltage	V_{CEX}(sus)	I_C=2.5A, I_{B1}=−I_{B2}=1A L=1mH, Clamped	500			V
Collector Cutoff Current	I_{CBO}	V_{CB}=500V, I_E=0			10	μA
Emitter Cutoff Current	I_{EBO}	V_{EB}=5V, I_C=0			10	μA
DC Current Gain	h_{FE}1	V_{CE}=5V, I_C=0.6A	15		50	
	h_{FE}2	V_{CE}=5V, I_C=3A	8			
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			1.5	V
Output Capacitance	C_{ob}	V_{CB}=10V, I_E=0, f=1MHz		80		pF
Current Gain Bandwidth Product	f_T	V_{CE}=10V, I_C=0.6A		18		MHz
Trun On Time	t_{on}	V_{CC}=200V			0.5	μS
Storage Time	t_S	5I_{B1}=−2.5I_{B2}=I_C=4A			3	μS
Fall Time	t_f	RL=50Ω			0.3	μS

h_{FE} (1) CLASSIFICATION

Classification	R	O	Y
h_{FE} 1	15-30	20-40	30-50

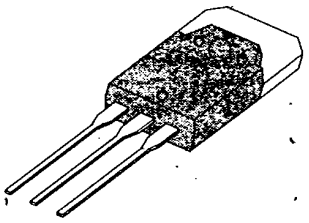
KSC5022 NPN SILICON TRANSISTOR

T-33-11

HIGH VOLTAGE AND HIGH RELIABILITY

HIGH SPEED SWITCHING: t_f = 0.1 μS (Typ)
WIDE SOA

TO-3P



1. Base 2. Collector 3. Emitter

3

ABSOLUTE MAXIMUM RATINGS (T_a=25°C)

Characteristic	Symbol	Rating	Unit
Collector-Base Voltage	V_{CBO}	800	V
Collector-Emitter Voltage	V_{CEO}	500	V
Emitter-Base Voltage	V_{EBO}	7	V
Collector Current (DC)	I_C	4	A
Collector Current (Pulse)	I_C	8	A
Base Current	I_B	1.5	A
Collector Dissipation	P_C	60	W
Junction Temperature	Tj	150	°C
Storage Temperature	Tstg	−55~150	°C

ELECTRICAL CHARACTERISTICS (T_a=25°C)

Characteristic	Symbol	Test Condition	Min	Typ	Max	Unit
Collector Base Breakdown Voltage	BV_{CBO}	I_C=1mA, I_E=0	800			V
Collector Emitter Breakdown Voltage	BV_{CEO}	I_C=5mA, R_{BE}=∞	500			V
Emitter Base Breakdown Voltage	BV_{EBO}	I_E=1mA, I_C=0	7			V
Collector Emitter Sustaining Voltage	$V_{CEX(sus)}$	I_C=1.5A, I_{B1}=−I_{B2}=0.6A L=1mH, Clamped	500			V
Collector Cutoff Current	I_{CBO}	V_{CB}=500V, I_E=0			10	μA
Emitter Cutoff Current	I_{EBO}	V_{EB}=5V, I_C=0			10	μA
DC Current Gain	$h_{FE}1$	V_{CE}=5V, I_C=0.3A	15		50	
	$h_{FE}2$	V_{CE}=5V, I_C=1.5A	8			
Collector Emitter Saturation Voltage	$V_{CE(sat)}$	I_C=1.5A, I_B=0.3A			1	V
Base Emitter Saturation Voltage	$V_{BE(sat)}$	I_C=1.5A, I_B=0.3A			1.5	V
Output Capacitance	C_{ob}	V_{CB}=10V, I_E=0, f=1MHz		50		pF
Current Gain Bandwidth Product	f_T	V_{CE}=10V, I_C=0.3A		18		MHz
Trun On Time	t_{on}	V_{CC}=200V			0.5	μS
Storage Time	t_S	$5I_{B1}$=−$2.5I_{B2}$=I_C=2A			3	μS
Fall Time	t_f	R_L=100Ω			0.3	μS

h_{FE} (1) CLASSIFICATION

Classification	R	O	Y
h_{FE} 1	15-30	20-40	30-50

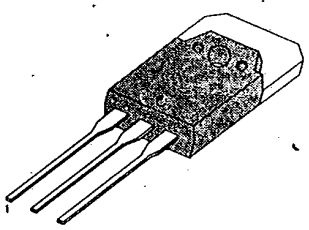
KSC5023 NPN SILICON TRANSISTOR

T-33-13

HIGH VOLTAGE AND HIGH RELIABILITY

HIGH SPEED SWITCHING: t_f = 0.1 μS (Typ)
WIDE SOA

TO-3P



1. Base 2. Collector 3. Emitter

ABSOLUTE MAXIMUM RATINGS (T_a=25°C)

Characteristic	Symbol	Rating	Unit
Collector-Base Voltage	V_{CBO}	800	V
Collector-Emitter Voltage	V_{CEO}	500	V
Emitter-Base Voltage	V_{EBO}	7	V
Collector Current (DC)	I_C	7	A
Collector Current (Pulse)	I_C	14	A
Base Current	I_B	3	A
Collector Dissipation	P_C	80	W
Junction Temperature	Tj	150	°C
Storage Temperature	Tstg	−55~150	°C

ELECTRICAL CHARACTERISTICS (T_a=25°C)

Characteristic	Symbol	Test Condition	Min	Typ	Max	Unit
Collector Base Breakdown Voltage	BV_{CBO}	I_C=1mA, I_E=0	800			V
Collector Emitter Breakdown Voltage	BV_{CEO}	I_C=5mA, R_{BE}=∞	500			V
Emitter Base Breakdown Voltage	BV_{EBO}	I_E=1mA, I_C=0	7			V
Collector Emitter Sustaining Voltage	$V_{CEX(SUS)}$	I_C=2.5A, I_B1=−I_B2=1A L=1mH, Clamped	500			V
Collector Cutoff Current	I_{CBO}	V_{CB}=500V, I_E=0			10	μA
Emitter Cutoff Current	I_{EBO}	V_{EB}=5V, I_C=0			10	μA
DC Current Gain	$h_{FE}1$	V_{CE}=5V, I_C=0.6A	15		50	
	$h_{FE}2$	V_{CE}=5V, I_C=3A	8			
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			1.5	V
Output Capacitance	C_{ob}	V_{CB}=10V, I_E=0, f=1MHz		80		pF
Current Gain Bandwidth Product	f_T	V_{CE}=10V, I_C=0.6A		18		MHz
Trun On Time	t_{on}	V_{CC}=200V			0.5	μS
Storage Time	t_S	$5I_B1$=−$2.5I_B2$=I_C=4A			3	μS
Fall Time	t_f	RL=50Ω			0.3	μS

h_{FE} (1) CLASSIFICATION

Classification	R	O	Y
h_{FE} 1	15-30	20-40	30-50