

**KSC5024**

**NPN SILICON TRANSISTOR**

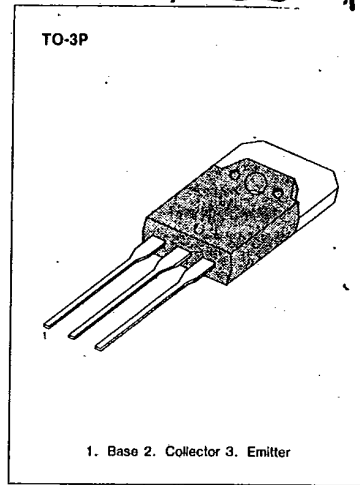
**HIGH VOLTAGE AND HIGH RELIABILITY**

HIGH SPEED SWITCHING  
WIDE SOA

T-33-13

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

Characteristic	Symbol	Rating	Unit
Collector-Base Voltage	V <sub>CB0</sub>	800	V
Collector-Emitter Voltage	V <sub>CE0</sub>	500	V
Emitter-Base Voltage	V <sub>EB0</sub>	7	V
Collector Current (DC)	I <sub>C</sub>	10	A
Collector Current (Pulse)	I <sub>C</sub>	20	A
Base Current	I <sub>B</sub>	3	A
Collector Dissipation	P <sub>C</sub>	90	W
Junction Temperature	T <sub>J</sub>	150	°C
Storage Temperature	T <sub>stg</sub>	-55~150	°C



3

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

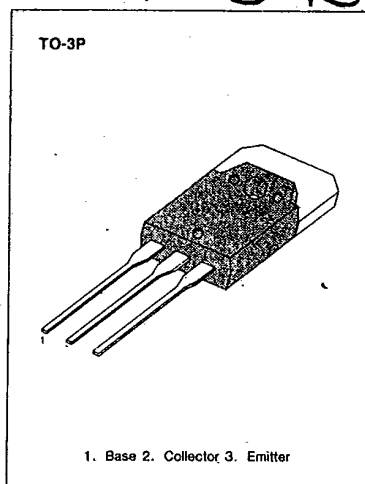
Characteristic	Symbol	Test Condition	Min	Typ	Max	Unit
Collector Base Breakdown Voltage	BV <sub>CB0</sub>	I <sub>C</sub> =1mA, I <sub>E</sub> =0	800			V
Collector Emitter Breakdown Voltage	BV <sub>CE0</sub>	I <sub>C</sub> =5mA, R <sub>BE</sub> =∞	500			V
Emitter Base Breakdown Voltage	BV <sub>EB0</sub>	I <sub>E</sub> =1mA, I <sub>C</sub> =0	7			V
Collector Emitter Sustaining Voltage	V <sub>CEX(SUS)</sub>	I <sub>C</sub> =3.5A, I <sub>B1</sub> =-I <sub>B2</sub> =1.4A L=500μH, Clamped	500			V
Collector Cutoff Current	I <sub>CB0</sub>	V <sub>CB</sub> =500V, I <sub>E</sub> =0			10	μA
Emitter Cutoff Current	I <sub>EB0</sub>	V <sub>EB</sub> =5V, I <sub>C</sub> =0			10	μA
DC Current Gain	h <sub>FE1</sub>	V <sub>CE</sub> =5V, I <sub>C</sub> =0.8A	15		50	
	h <sub>FE2</sub>	V <sub>CE</sub> =5V, I <sub>C</sub> =4A	8			
Collector Emitter Saturation Voltage	V <sub>CE(sat)</sub>	I <sub>C</sub> =4A, I <sub>B</sub> =0.8A			1	V
Base Emitter Saturation Voltage	V <sub>BE(sat)</sub>	I <sub>C</sub> =4A, I <sub>B</sub> =0.8A			1.5	V
Output Capacitance	C <sub>ob</sub>	V <sub>CB</sub> =10V, I <sub>E</sub> =0, f=1MHz		120		pF
Current Gain Bandwidth Product	f <sub>T</sub>	V <sub>CE</sub> =10V, I <sub>C</sub> =0.8A		18		MHz
Turn On Time	t <sub>on</sub>	V <sub>CC</sub> =200V			0.5	μS
Storage Time	t <sub>s</sub>	5I <sub>B1</sub> =-2.5I <sub>B2</sub> =I <sub>C</sub> =5A			3	μS
Fall Time	t <sub>f</sub>	RL=40Ω			0.3	μS

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

Classification	R	O	Y
h <sub>FE</sub> 1.	15-30	20-40	30-50

**KSC5025****NPN SILICON TRANSISTOR****HIGH VOLTAGE AND HIGH RELIABILITY**HIGH SPEED SWITCHING  
WIDE SOA**ABSOLUTE MAXIMUM RATINGS ( $T_a = 25^\circ\text{C}$ )**

Characteristic	Symbol	Rating	Unit
Collector-Base Voltage	$V_{CB0}$	800	V
Collector-Emitter Voltage	$V_{CE0}$	500	V
Emitter-Base Voltage	$V_{EB0}$	7	V
Collector Current (DC)	$I_C$	15	A
Collector Current (Pulse)	$I_C$	25	A
Base Current	$I_B$	4	A
Collector Dissipation	$P_C$	100	W
Junction Temperature	$T_j$	150	$^\circ\text{C}$
Storage Temperature	$T_{stg}$	-55~150	$^\circ\text{C}$

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

Characteristic	Symbol	Test Condition	Min	Typ	Max	Unit
Collector Base Breakdown Voltage	$BV_{CBO}$	$I_C = 1\text{mA}, I_E = 0$	800			V
Collector Emitter Breakdown Voltage	$BV_{CEO}$	$I_C = 5\text{mA}, R_{BE} = \infty$	500			V
Emitter Base Breakdown Voltage	$BV_{EBO}$	$I_E = 1\text{mA}, I_C = 0$	7			V
Collector Emitter Sustaining Voltage	$V_{CEX(SUS)}$	$I_C = 5\text{A}, I_B = -I_C = 2\text{A}$ $L = 500\mu\text{H}$ , Clamped	500			V
Collector Cutoff Current	$I_{CBO}$	$V_{CB} = 500\text{V}, I_E = 0$			10	$\mu\text{A}$
Emitter Cutoff Current	$I_{EBO}$	$V_{EB} = 5\text{V}, I_C = 0$			10	$\mu\text{A}$
DC Current Gain	$h_{FE1}$	$V_{CE} = 5\text{V}, I_C = 1.2\text{A}$	15		50	
	$h_{FE2}$	$V_{CE} = 5\text{V}, I_C = 8\text{A}$	8			
Collector Emitter Saturation Voltage	$V_{CE(sat)}$	$I_C = 8\text{A}, I_B = 1.2\text{A}$			1	V
Base Emitter Saturation Voltage	$V_{BE(sat)}$	$I_C = 8\text{A}, I_B = 1.2\text{A}$			1.5	V
Output Capacitance	$C_{ob}$	$V_{CB} = 10\text{V}, I_E = 0, f = 1\text{MHz}$		160		pF
Current Gain Bandwidth Product	$f_T$	$V_{CE} = 10\text{V}, I_C = 1.2\text{A}$		18		MHz
Turn On Time	$t_{on}$	$V_{CC} = 200\text{V}$			0.5	$\mu\text{s}$
Storage Time	$t_s$	$5I_B = -2.5I_C = I_C = 7\text{A}$			3	$\mu\text{s}$
Fall Time	$t_f$	$R_L = 28.6\Omega$			0.3	$\mu\text{s}$

 **$h_{FE}$  (1) CLASSIFICATION**

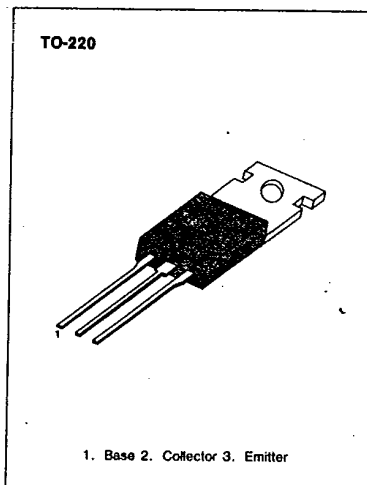
Classification	R	O	Y
$h_{FE} 1$	15-30	20-40	30-50

**KSC5026****NPN SILICON TRANSISTOR**

T-33-11

**HIGH VOLTAGE AND HIGH RELIABILITY**HIGH SPEED SWITCHING  
WIDE SOA**ABSOLUTE MAXIMUM RATINGS (T<sub>a</sub> = 25°C)**

Characteristic	Symbol	Rating	Unit
Collector-Base Voltage	V <sub>CB0</sub>	1100	V
Collector-Emitter Voltage	V <sub>CE0</sub>	800	V
Emitter-Base Voltage	V <sub>EB0</sub>	7	V
Collector Current (DC)	I <sub>C</sub>	1.5	A
Collector Current (Pulse)	I <sub>C</sub>	5	A
Base Current	I <sub>B</sub>	0.8	A
Collector Dissipation	P <sub>C</sub>	40	W
Junction Temperature	T <sub>J</sub>	150	°C
Storage Temperature	T <sub>stg</sub>	-55~150	°C



3

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

Characteristic	Symbol	Test Condition	Min	Typ	Max	Unit
Collector Base Breakdown Voltage	BV <sub>CB0</sub>	I <sub>C</sub> = 1mA, I <sub>E</sub> = 0	1100			V
Collector Emitter Breakdown Voltage	BV <sub>CE0</sub>	I <sub>C</sub> = 5mA, R <sub>BE</sub> = ∞	800			V
Emitter Base Breakdown Voltage	BV <sub>EB0</sub>	I <sub>E</sub> = 1mA, I <sub>C</sub> = 0	7			V
Collector Emitter Sustaining Voltage	V <sub>CEX(sus)</sub>	I <sub>C</sub> = 0.75A I <sub>B1</sub> = -I <sub>B2</sub> = 0.15A L = 5mH, Clamped	800			V
Collector Cutoff Current	I <sub>CB0</sub>	V <sub>CB</sub> = 800V, I <sub>E</sub> = 0			10	μA
Emitter Cutoff Current	I <sub>EB0</sub>	V <sub>EB</sub> = 5V, I <sub>C</sub> = 0			10	μA
DC Current Gain	h <sub>FE1</sub>	V <sub>CE</sub> = 5V, I <sub>C</sub> = 0.1A	10		40	
	h <sub>FE2</sub>	V <sub>CE</sub> = 5V, I <sub>C</sub> = 0.5A	8			
Collector Emitter Saturation Voltage	V <sub>CE(sat)</sub>	I <sub>C</sub> = 0.75A, I <sub>B</sub> = 0.15A			2	V
Base Emitter Saturation Voltage	V <sub>BE(sat)</sub>	I <sub>C</sub> = 0.75A, I <sub>B</sub> = 0.15A			1.5	V
Output Capacitance	C <sub>ob</sub>	V <sub>CB</sub> = 10V, I <sub>E</sub> = 0, f = 1MHz		35		pF
Current Gain Bandwidth Product	f <sub>T</sub>	V <sub>CE</sub> = 10V, I <sub>C</sub> = 0.1A		15		MHz
Turn On Time	t <sub>on</sub>	V <sub>CC</sub> = 400V			0.5	μs
Storage Time	t <sub>s</sub>	5I <sub>B1</sub> = -2.5I <sub>B2</sub> = I <sub>C</sub> = 1A			3	μs
Fall Time	t <sub>f</sub>	R <sub>L</sub> = 400Ω			0.3	μs

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

Classification	N	R	O
h <sub>FE</sub> 1	10-20	15-30	20-40



**KSC5027**

**NPN SILICON TRANSISTOR**

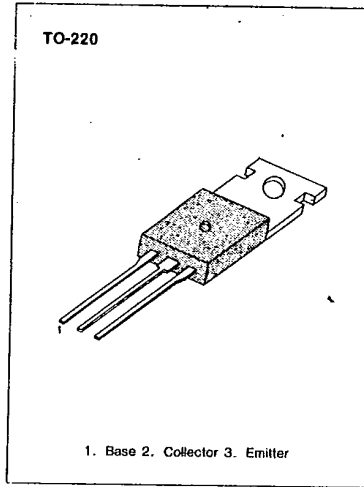
T-33-11

**HIGH VOLTAGE AND HIGH RELIABILITY**

HIGH SPEED SWITCHING  
WIDE SOA

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

Characteristic	Symbol	Rating	Unit
Collector-Base Voltage	V <sub>CB0</sub>	1100	V
Collector-Emitter Voltage	V <sub>CE0</sub>	800	V
Emitter-Base Voltage	V <sub>EB0</sub>	7	V
Collector Current (DC)	I <sub>C</sub>	3	A
Collector Current (Pulse)	I <sub>C</sub>	10	A
Base Current	I <sub>B</sub>	1.5	A
Collector Dissipation	P <sub>C</sub>	50	W
Junction Temperature	T <sub>J</sub>	150	°C
Storage Temperature	T <sub>stg</sub>	-55~150	°C



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

Characteristic	Symbol	Test Condition	Min	Typ	Max	Unit
Collector Base Breakdown Voltage	BV <sub>CB0</sub>	I <sub>C</sub> = 1mA, I <sub>E</sub> = 0	1100			V
Collector Emitter Breakdown Voltage	BV <sub>CE0</sub>	I <sub>C</sub> = 5mA, R <sub>BE</sub> = ∞	800			V
Emitter Base Breakdown Voltage	BV <sub>EB0</sub>	I <sub>E</sub> = 1mA, I <sub>C</sub> = 0	7			V
Collector Emitter Sustaining Voltage	V <sub>CES(sus)</sub>	I <sub>C</sub> = 1.5A, I <sub>B1</sub> = -I <sub>B2</sub> = 0.3A L = 2mH, Clamped	800			V
Collector Cutoff Current	I <sub>CB0</sub>	V <sub>CB</sub> = 800V, I <sub>E</sub> = 0			10	μA
Emitter Cutoff Current	I <sub>EB0</sub>	V <sub>EB</sub> = 5V, I <sub>C</sub> = 0			10	μA
DC Current Gain	h <sub>FE1</sub>	V <sub>CE</sub> = 5V, I <sub>C</sub> = 0.2A	10		40	
	h <sub>FE2</sub>	V <sub>CE</sub> = 5V, I <sub>C</sub> = 1A	8			
Collector Emitter Saturation Voltage	V <sub>CE(sat)</sub>	I <sub>C</sub> = 1.5A, I <sub>B</sub> = 0.3A			2	V
Base Emitter Saturation Voltage	V <sub>BE(sat)</sub>	I <sub>C</sub> = 1.5A, I <sub>B</sub> = 0.3A			1.5	V
Output Capacitance	C <sub>ob</sub>	V <sub>CB</sub> = 10V, I <sub>E</sub> = 0, f = 1MHz		60		pF
Current Gain Bandwidth Product	f <sub>T</sub>	V <sub>CE</sub> = 10V, I <sub>C</sub> = 0.2A		15		MHz
Turn On Time	t <sub>on</sub>	V <sub>CC</sub> = 400V			0.5	μS
Storage Time	t <sub>s</sub>	5I <sub>B1</sub> = -2.5I <sub>B2</sub> = I <sub>C</sub> = 2A			3	μS
Fall Time	t <sub>f</sub>	RL = 200Ω			0.3	μS

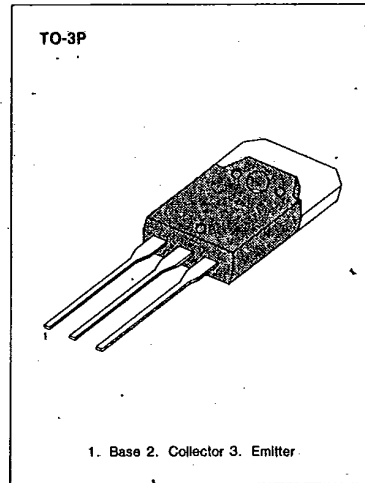
**h<sub>FE</sub> (1) CLASSIFICATION**

Classification	N	R	O
h <sub>FE</sub> 1	10-20	15-30	20-40



**KSC5028****NPN SILICON TRANSISTOR****HIGH VOLTAGE AND HIGH RELIABILITY**HIGH SPEED SWITCHING  
WIDE SOA**ABSOLUTE MAXIMUM RATINGS ( $T_a = 25^\circ\text{C}$ )**

Characteristic	Symbol	Rating	Unit
Collector-Base Voltage	$V_{CBO}$	1100	V
Collector-Emitter Voltage	$V_{CEO}$	800	V
Emitter-Base Voltage	$V_{EBO}$	7	V
Collector Current (DC)	$I_C$	3	A
Collector Current (Pulse)	$I_C$	10	A
Base Current	$I_B$	1.5	A
Collector Dissipation	$P_C$	80	W
Junction Temperature	$T_J$	150	$^\circ\text{C}$
Storage Temperature	$T_{stg}$	-55~150	$^\circ\text{C}$



3

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

Characteristic	Symbol	Test Condition	Min	Typ	Max	Unit
Collector Base Breakdown Voltage	$BV_{CBO}$	$I_C = 1\text{mA}, I_E = 0$	1100			V
Collector Emitter Breakdown Voltage	$BV_{CEO}$	$I_C = 5\text{mA}, R_{BE} = \infty$	800			V
Emitter Base Breakdown Voltage	$BV_{EBO}$	$I_E = 1\text{mA}, I_C = 0$	7			V
Collector Emitter Sustaining Voltage	$V_{CEX(sus)}$	$I_C = 1.5\text{A}, I_{B1} = -I_{B2} = 0.3\text{A}$ $L = 2\text{mH}$ , Clamped	800			V
Collector Cutoff Current	$I_{CBO}$	$V_{CB} = 800\text{V}, I_E = 0$			10	$\mu\text{A}$
Emitter Cutoff Current	$I_{EBO}$	$V_{EB} = 5\text{V}, I_C = 0$			10	$\mu\text{A}$
DC Current Gain	$h_{FE1}$	$V_{CE} = 5\text{V}, I_C = 0.2\text{A}$	10		40	
	$h_{FE2}$	$V_{CE} = 5\text{V}, I_C = 1\text{A}$	8			
Collector Emitter Saturation Voltage	$V_{CE(sat)}$	$I_C = 1.5\text{A}, I_B = 0.3\text{A}$			2	V
Base Emitter Saturation Voltage	$V_{BE(sat)}$	$I_C = 1.5\text{A}, I_B = 0.3\text{A}$			1.5	V
Output Capacitance	$C_{ob}$	$V_{CB} = 10\text{V}, I_E = 0, f = 1\text{MHz}$		60		pF
Current Gain Bandwidth Product	$f_T$	$V_{CE} = 10\text{V}, I_C = 0.2\text{A}$		15		MHz
Turn On Time	$t_{on}$	$V_{CC} = 400\text{V}$			0.5	$\mu\text{s}$
Storage Time	$t_s$	$5I_{B1} = -2.5I_{B2} = I_C = 2\text{A}$			3	$\mu\text{s}$
Fall Time	$t_f$	$R_L = 200\Omega$			0.3	$\mu\text{s}$

 **$h_{FE}$  (1) CLASSIFICATION**

Classification	N	R	O
$h_{FE} 1$	10-20	15-30	20-40



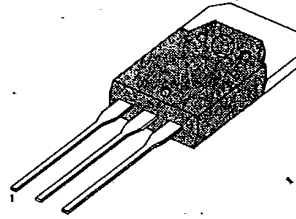
**KSC5029****NPN SILICON TRANSISTOR**

T-33-13

**HIGH VOLTAGE AND HIGH RELIABILITY**HIGH SPEED SWITCHING  
WIDE SOA**ABSOLUTE MAXIMUM RATINGS (T<sub>a</sub>=25°C)**

Characteristic	Symbol	Rating	Unit
Collector-Base Voltage	V <sub>CB0</sub>	1100	V
Collector-Emitter Voltage	V <sub>CE0</sub>	800	V
Emitter-Base Voltage	V <sub>EB0</sub>	7	V
Collector Current (DC)	I <sub>C</sub>	4.5	A
Collector Current (Pulse)	I <sub>C</sub>	15	A
Base Current	I <sub>B</sub>	2	A
Collector Dissipation	P <sub>C</sub>	90	W
Junction Temperature	T <sub>J</sub>	150	°C
Storage Temperature	T <sub>stg</sub>	-55~150	°C

TO-3P



1. Base 2. Collector 3. Emitter

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

Characteristic	Symbol	Test Condition	Min	Typ	Max	Unit
Collector Base Breakdown Voltage	BV <sub>CB0</sub>	I <sub>C</sub> =1mA, I <sub>E</sub> =0	1100			V
Collector Emitter Breakdown Voltage	BV <sub>CE0</sub>	I <sub>C</sub> =5mA, R <sub>BE</sub> =∞	800			V
Emitter Base Breakdown Voltage	BV <sub>EB0</sub>	I <sub>E</sub> =1mA, I <sub>C</sub> =0	7			V
Collector Emitter Sustaining Voltage	V <sub>CEX(sus)</sub>	I <sub>C</sub> =2A, I <sub>B1</sub> =-I <sub>B2</sub> =0.4A L=2mH, Clamped	800			V
Collector Cutoff Current	I <sub>CB0</sub>	V <sub>CB</sub> =800V, I <sub>E</sub> =0			10	μA
Emitter Cutoff Current	I <sub>EB0</sub>	V <sub>EB</sub> =5V, I <sub>C</sub> =0			10	μA
DC Current Gain	h <sub>FE1</sub>	V <sub>CE</sub> =5V, I <sub>C</sub> =0.3A	10		40	
	h <sub>FE2</sub>	V <sub>CE</sub> =5V, I <sub>C</sub> =1.5A	8			
Collector Emitter Saturation Voltage	V <sub>CE(sat)</sub>	I <sub>C</sub> =2A, I <sub>B</sub> =0.4A			2	V
Base Emitter Saturation Voltage	V <sub>BE(sat)</sub>	I <sub>C</sub> =2A, I <sub>B</sub> =0.4A			1.5	V
Output Capacitance	C <sub>ob</sub>	V <sub>CB</sub> =10V, I <sub>E</sub> =0, f=1MHz		90		pF
Current Gain Bandwidth Product	f <sub>T</sub>	V <sub>CE</sub> =10V, I <sub>C</sub> =0.3A		15		MHz
Turn On Time	t <sub>on</sub>	V <sub>CC</sub> =400V			0.5	μs
Storage Time	t <sub>s</sub>	5I <sub>B1</sub> =-2.5I <sub>B2</sub> =I <sub>C</sub> =3A			3	μs
Fall Time	t <sub>f</sub>	RL=133Ω			0.3	μs

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

Classification	N	R	O
h <sub>FE</sub> 1	10-20	15-30	20-40

