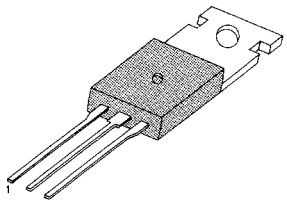
HIGH SPEED, HIGH VOLTAGE SWITCHING
LOW COLLECTOR SATURATION VOLTAGE
SPECIFIED OF REVERSE BIASED SOA
WITH INDUCTIVE LOADS

TO-220



1. Base 2. Collector 3. Emitter

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	4	A
*Collector Current (Pulse)	I_C	8	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

* 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=2A, I_B=0.4A, L=1mH	400		V
Collector-Emitter Sustaining Voltage	V_{CEX}(sus)1	I_C=2A, I_B1=−I_B2=0.4A T_a=125°C, L=180μH, Clamped	450		V
Collector-Emitter Sustaining Voltage	V_{CEX}(sus)2	I_C=4A, I_B1=0.8A, −I_B2=0.4A 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)=−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_{FE}1	V_{CE}=5V, I_C=0.3A	20	80	
	h_{FE}2	V_{CE}=5V, I_C=1.5A	10		
*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
Turn On Time	ton	I_C=2A, I_B1=−I_B2=0.4A		1	μS
Storage Time	tstg	RL=75Ω, V_{CC}=150V		2.5	μS
Fall Time	tf			0.7	μS

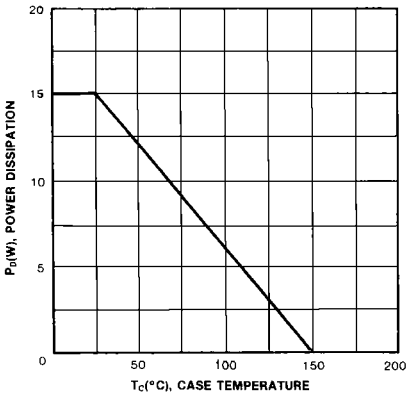
* Pulse Test: PW≤350μs, Duty Cycle≤2% Pulsed

h_{EE} (1) CLASSIFICATION

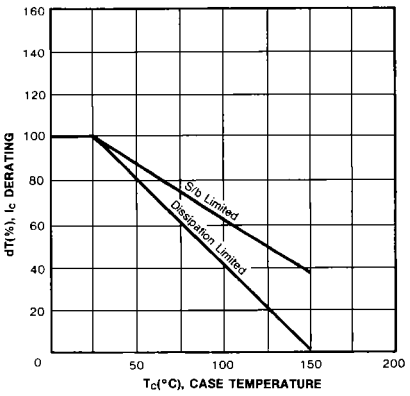
Classification	R	O	Y
h_{FE}1	20-40	30-60	40-80

NPN Transistor KSC2518 datasheet

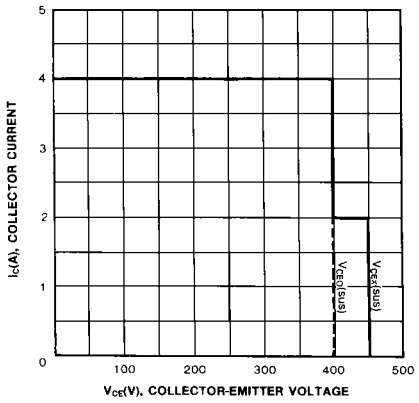
POWER DERATING



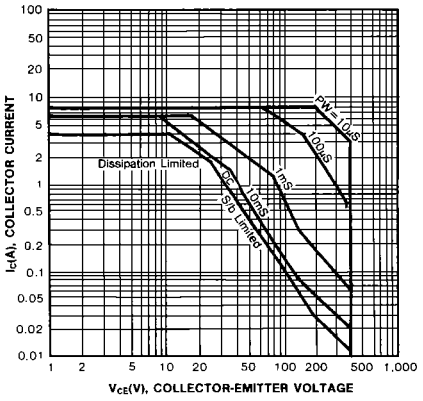
DERATING CURVE OF SAFE OPERATING AREAS



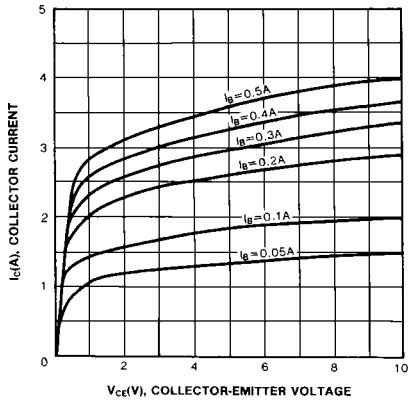
REVERSE BIAS SAFE OPERATING AREA



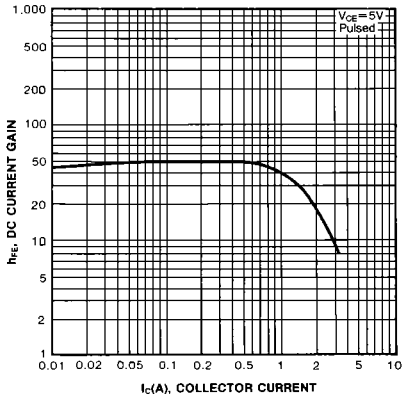
FORWARD BIAS SAFE OPERATING AREA

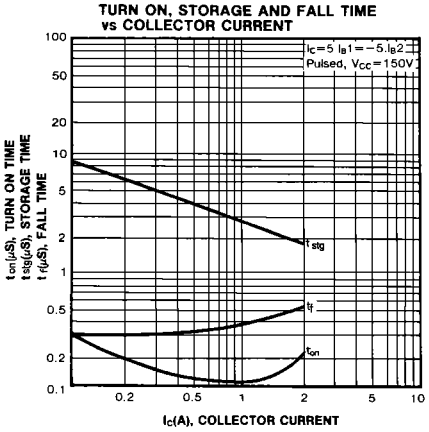


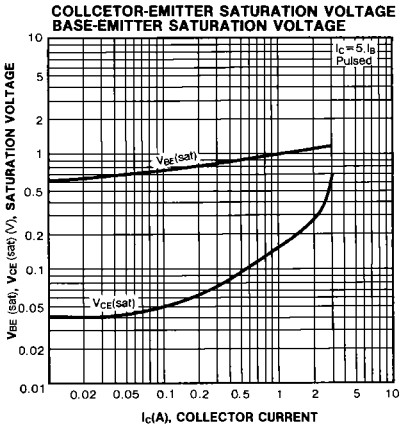
STATIC CHARACTERISTIC



DC CURRENT GAIN




TURN ON, STORAGE AND FALL TIME
vs COLLECTOR CURRENT
I_C=5 I_{B1}=−5.I_{B2}
Pulsed, V_{CC}=150V
t_{on}(μS), TURN ON TIME
t_{stg}(μS), STORAGE TIME
t_f(μS), FALL TIME
100
50
20
10
5
2
1
0.5
0.2
0.1
0.2
0.5
1
2
5
10
t_{stg}
t_f
t_{on}
I_C(A), COLLECTOR CURRENT


COLLCETOR-EMITTER SATURATION VOLTAGE
BASE-EMITTER SATURATION VOLTAGE
I_C=5.I_B
Pulsed
V_{BE} (sat), V_{CE} (sat) (V), SATURATION VOLTAGE
10
5
2
1
0.5
0.2
0.1
0.05
0.02
0.01
V_{BE}(sat)
V_{CE}(sat)
0.02
0.05
0.1
0.2
0.5
1
2
5
10
I_C(A), COLLECTOR CURRENT