

SWITCHMODE SERIES NPN POWER TRANSISTORS

... designed for use in high-voltage, high-speed, power switching in inductive circuit, and switchmode applications such as switching regulator's, converters.

FEATURES:

*Collector-Emitter Sustaining Voltage-

$$V_{CE(sus)} = 400 \text{ V (Min)}$$

* Collector-Emitter Saturation Voltage -

$$V_{CE(sat)} = 1.2 \text{ V (Max.) @ } I_C = 4.0 \text{ A, } I_B = 0.8 \text{ A}$$

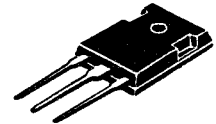
* Switching Time - $t_r = 1.0 \text{ us (Max.) @ } I_C = 5.0 \text{ A}$

NPN
2SC2625

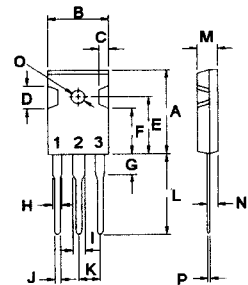
10 AMPERE
SILICON POWER
TRANSISTORS
400 VOLTS
80 WATTS

MAXIMUM RATINGS

Characteristic	Symbol	2SC2625	Unit
Collector-Emitter Voltage	V_{CEO}	400	V
Collector-Base Voltage	V_{CBO}	450	V
Emitter-Base Voltage	V_{EBO}	7.0	V
Collector Current - Continuous	I_C	10	A
- Peak	I_{CM}	20	
Base current	I_B	3.0	A
Total Power Dissipation @ $T_C = 25^\circ\text{C}$ Derate above 25°C	P_D	80 0.64	W W/ $^\circ\text{C}$
Operating and Storage Junction Temperature Range	T_J, T_{STG}	-55 to +150	$^\circ\text{C}$



TO-247(3P)



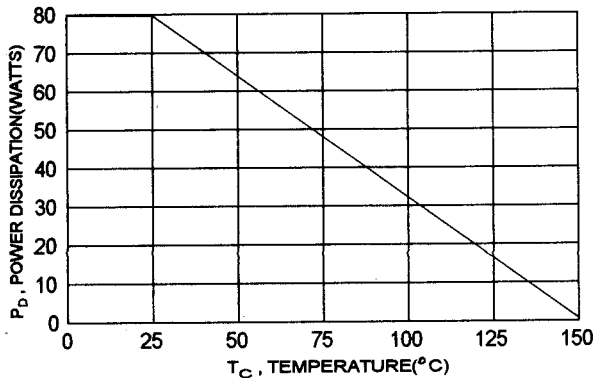
PIN 1.BASE
2.COLLECTOR
3.EMITTER

THERMAL CHARACTERISTICS

Characteristic	Symbol	Max	Unit
Thermal Resistance Junction to Case	$R_{\theta jc}$	1.56	$^\circ\text{C/W}$

DIM	MILLIMETERS	
	MIN	MAX
A	20.63	22.38
B	15.38	16.20
C	1.90	2.70
D	5.10	6.10
E	14.81	15.22
F	11.72	12.84
G	4.20	4.50
H	1.82	2.46
I	2.92	3.23
J	0.89	1.53
K	5.26	5.66
L	18.50	21.50
M	4.68	5.36
N	2.40	2.80
O	3.25	3.65
P	0.55	0.70

FIGURE -1 POWER DERATING



ELECTRICAL CHARACTERISTICS ($T_c = 25^\circ\text{C}$ unless otherwise noted)

Characteristic	Symbol	Min	Max	Unit
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OFF CHARACTERISTICS

Collector-Emitter Breakdown Voltage ($I_C = 10\text{ mA}$, $I_B = 0$)	$V_{(BR)CEO}$	400		V
Collector-Base Breakdown Voltage ($I_C = 1.0\text{ mA}$, $I_E = 0$)	$V_{(BR)CBO}$	450		V
Collector Cutoff Current ($V_{CB} = 450\text{ V}$, $I_E = 0$)	I_{CBO}		1.0	mA
Emitter Cutoff Current ($V_{EB} = 7.0\text{ V}$, $I_C = 0$)	I_{EBO}		100	uA

ON CHARACTERISTICS (1)

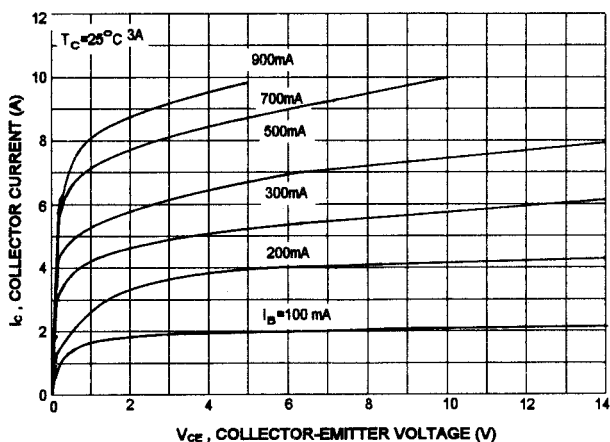
DC Current Gain ($I_C = 4.0\text{ A}$, $V_{CE} = 5.0\text{ V}$)	hFE	10		
Collector-Emitter Saturation Voltage ($I_C = 4.0\text{ A}$, $I_B = 800\text{ mA}$)	$V_{CE(sat)}$		1.2	V
Base-Emitter Saturation Voltage ($I_C = 4.0\text{ A}$, $I_B = 800\text{ mA}$)	$V_{BE(sat)}$		1.5	V

SWITCHING CHARACTERISTICS

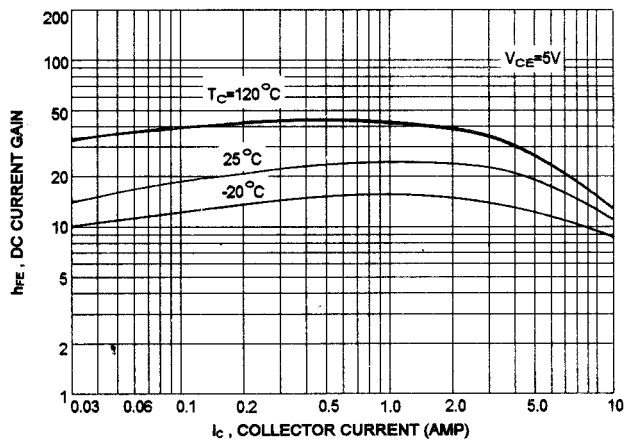
On Time	$V_{CC} = 150\text{ V}$, $I_C = 5.0\text{ A}$ $I_{B1} = -I_{B2} = 1.0\text{ A}$ $R_L = 30\text{ ohm}$	t_{on}		1.0	us
Storage Time		t_s		2.5	us
Fall Time		t_f		1.0	us

(1) Pulse Test: Pulse Width = 300 us, Duty Cycle $\leq 2.0\%$

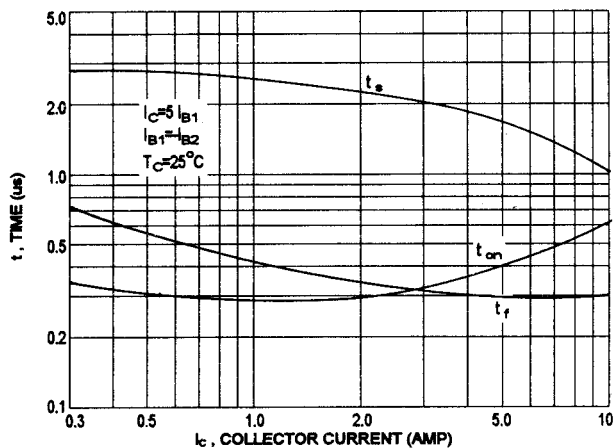
$I_c - V_{ce}$



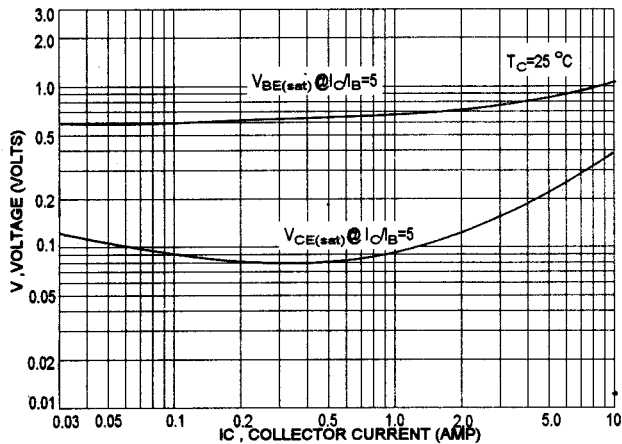
DC CURRENT GAIN



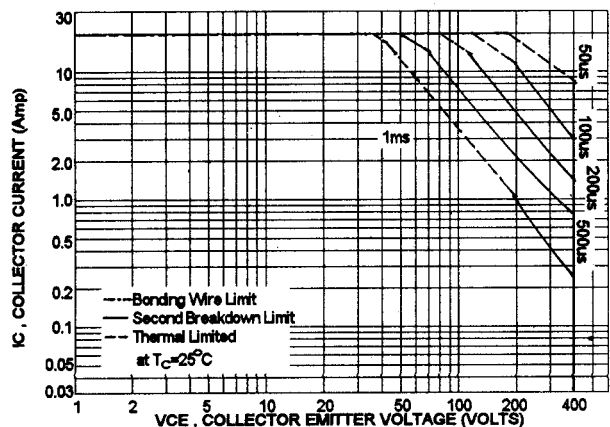
SWITCHING TIME



"ON" VOLTAGES



ACTIVE-REGION SAFE OPERATING AREA (SOA)



There are two limitation on the power handling ability of a transistor: average junction temperature and second breakdown safe operating area curves indicate $I_c - V_{CE}$ limits of the transistor that must be observed for reliable operation i.e., the transistor must not be subjected to greater dissipation than curves indicate.

The data of SOA curve is base on $T_{J(PK)} = 150^\circ C$; T_c is variable depending on conditions. second breakdown pulse limits are valid for duty cycles to 10% provided $T_{J(PK)} \leq 150^\circ C$. At high case temperatures, thermal limitation will reduce the power that can be handled to values less than the limitations imposed by second breakdown.