SGSD00042
SGSD00044

MULTIEPITAXIAL MESA HOLLOW EMITTER NPN

ADVANCE DATA

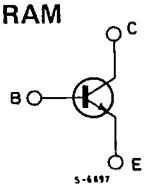
HIGH VOLTAGE FAST SWITCHING POWER TRANSISTORS

The SGSD00042 and SGSD00044 are multiepitaxial mesa hollow emitter NPN transistors in the TO-220 plastic package particularly intended for high voltage and fast switching applications at 20 to 100KHz.

ABSOLUTE MAXIMUM RATINGS

		SGSD00042	SGSD00044
V_{CES}	Collector-base voltage ($V_{BE} = 0$)	700V	1000V
V_{CEO}	Collector-emitter voltage ($I_B = 0$)	400V	450V
V_{EBO}	Emitter-base voltage ($I_C = 0$)	7V	
I_C	Collector current	5A	
I_{CM}	Collector peak current ($t_p < 5$ms)	10A	
I_B	Base current	2A	
I_{BM}	Base peak current ($t_p < 5$ms)	4A	
P_{tot}	Total dissipation at $T_{case} < 25°C$	90W	
T_{stg}	Storage temperature	-65 to 150°C	
T_j	Max. operating junction temperature	150°C	

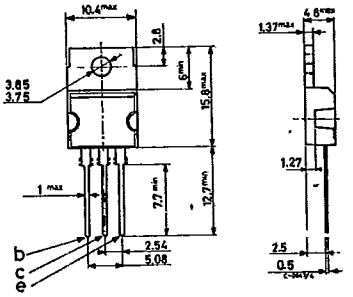
INTERNAL SCHEMATIC DIAGRAM



MECHANICAL DATA

Dimensions in mm

Collector connected to tab.



TO-220

SGSD00042
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THERMAL DATA

$R_{th\ j\text{-}case}$	Thermal resistance junction-case	max	1.38	°C/W

ELECTRICAL CHARACTERISTICS (T_{case} = 25°C unless otherwise specified)

Parameter		Test Conditions		Min.	Typ.	Max.	Unit
I_{CES}	Collector cutoff current (V_{BE} = 0)	V_{CE} = rated V_{CES}				0.2	mA
I_{CEO}	Collector cutoff current (I_B = 0)	V_{CE} = 300V V_{CE} = 380V	for **SGSD00042** for **SGSD00044**			1 1	mA mA
I_{EBO}	Emitter cutoff current (I_C = 0)	V_{BE} = 7V				1	mA
$V_{CEO\ (sus)}$*	Collector emitter sustaining voltage	I_C = 0.1A	for **SGSD00042** for **SGSD00044**	400 450			V V
$V_{CE\ (sat)}$*	Collector-emitter saturation voltage	I_C = 4A I_C = 3.2A	I_B = 1A for **SGSD00042** I_B = 0.8A for **SGSD00044**			1 1	V V
$V_{BE\ (sat)}$*	Base-emitter saturation voltage	I_C = 3.2A	I_B = 0.8A			1.3	V

RESISTIVE LOAD

t_{on} t_s t_f	Turn-on time Storage time Fall time	I_C = 4A I_{B1} = -I_{B2} = 1A	V_{CC} = 150V		0.6 1.5 0.25	1.0 2.5 0.5	μs μs μs
t_{on} t_s t_f	Turn-on time Storage time Fall time	I_C = 4A $2I_{B1}$ = -I_{B2} = 2A	V_{CC} = 150V		0.5 0.7 0.08	1.0 1.5 0.25	μs μs μs

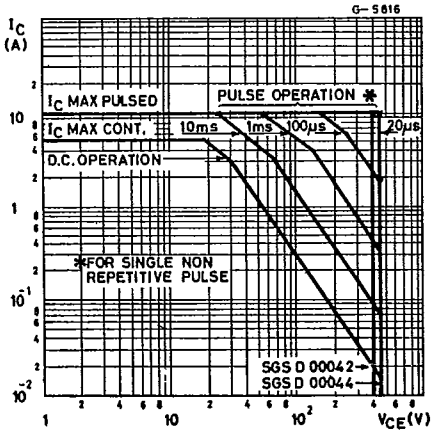
INDUCTIVE LOAD

t_s t_f	Storage time Fall time	I_C=4A; V_{CC}=150V; L=200μH $V_{BE\ (off)}$=5V; h_{FE}=4; T_{case}=25°C		0.6 0.10	1.2 0.2	μs μs
t_s t_f	Storage time Fall time	I_C=4A; V_{CC}=150V; L=200μH $V_{BE\ (off)}$=-5V; h_{FE}=4; T_{case} = 100°C		0.7 0.15	1.5 0.3	μs μs

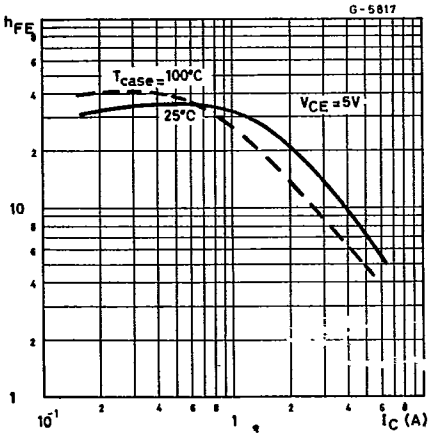
* Pulsed: Pulse duration = 300μs, duty cycle = 1.5%

SGSD00042
SGSD00044

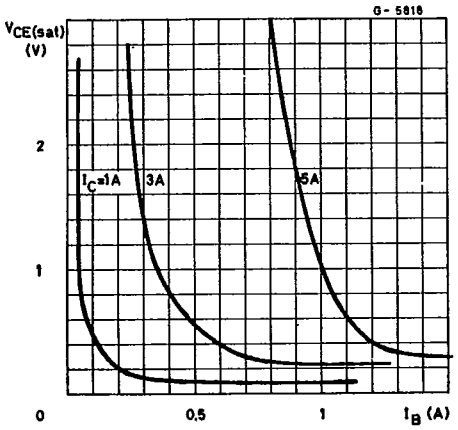
Safe operating areas



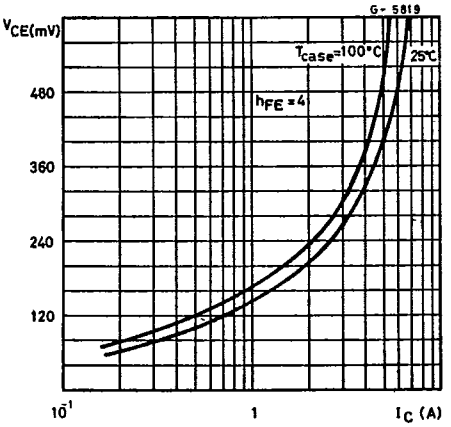
DC current gain



Collector-emitter saturation voltage

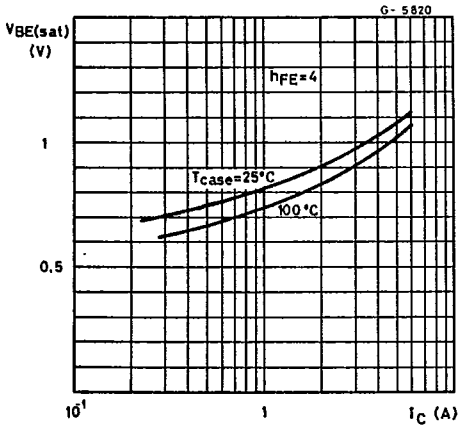


Collector-emitter saturation voltage

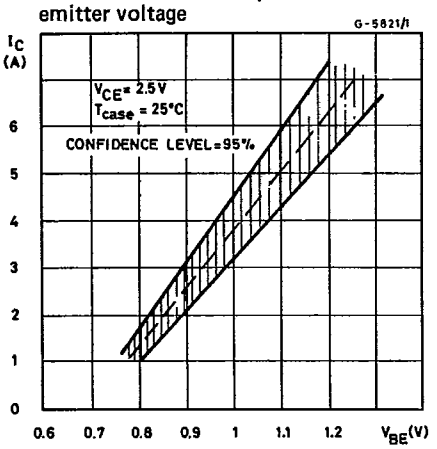


SGSD00042
SGSD00044

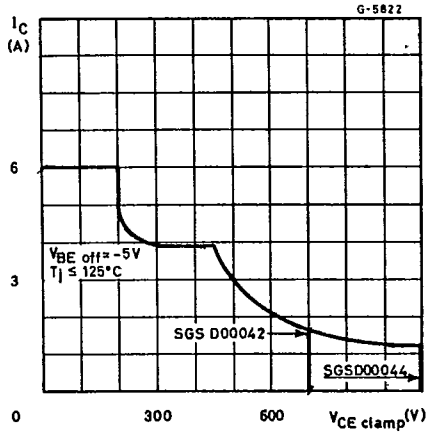
Base-emitter saturation voltage



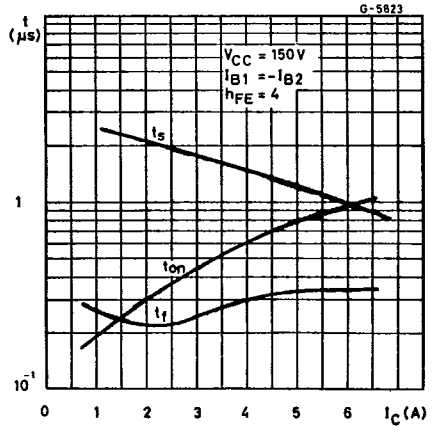
Collector current spread vs. base emitter voltage



Reverse biased safe operating area

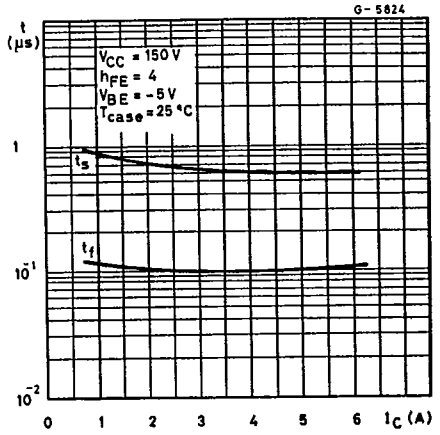


Resistive load switching times

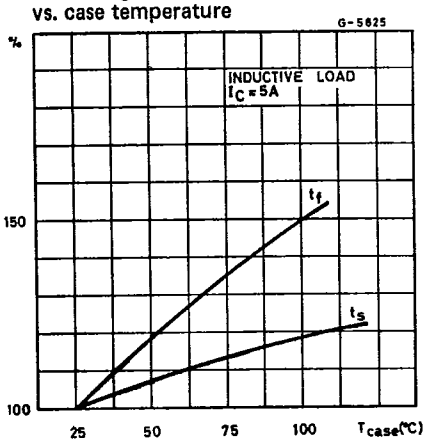


SGSD00042
SGSD00044

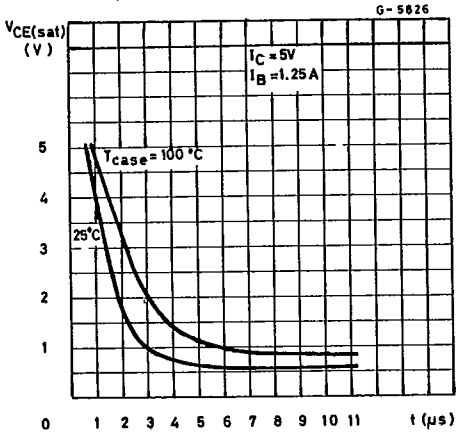
Inductive load switching times



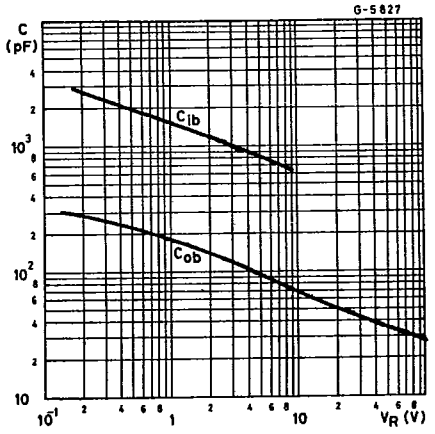
Switching times percentage variation vs. case temperature



$V_{CE(sat)}$ Dynamic

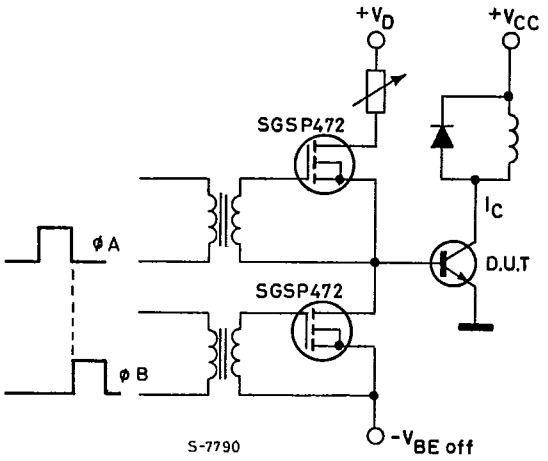


Capacitance



SGSD00042
SGSD00044

SWITCHING TIMES TEST CIRCUIT



V_{CC} = 150V
L = 0.2mH

ϕ_A = pulse width must be adjusted to obtain desired I_C value
ϕ_B = pulse width equal to ϕ_A pulse duration.