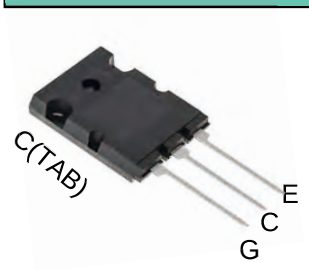
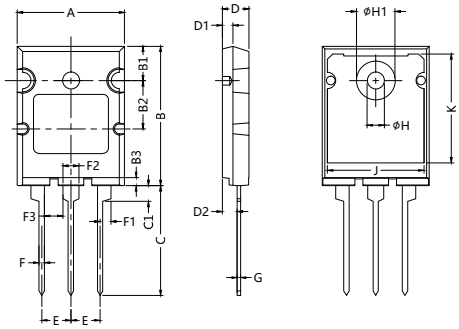
SG100T65UDB3

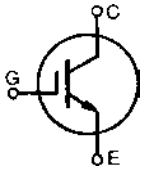
Discrete IGBTs



G=Gate,
C=Collector,
E=Emitter,
TAB=Collector

Dimensions TO-264





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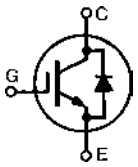

SG100T65UDB3

MAXIMUM RATING .Ta=25°C)

SYMBOL	CHARACTERISTIC		RATING	UNIT
V_{CES}	Collector-Emitter Voltage		650	V
V_{GES}	Gate-Emitter Voltage		±20	V
I_C	Collector Current	@Tc=25°C	120	A
		@Tc=100°C	100	A
I_{CM}*	Pulsed Collector Current		250	A
I_F	Diode Continuous Forward	@Tc=100°C	100	A
I_{FM}	Current Diode Maximum		200	A
P_D	Forward Current Maximum Power Dissipation	@Tc=25°C	520	W
		@Tc=100°C	260	W
T_j	Maximum Junction Temperature		175	°C
T_{stg}	Storage Temperature Range		-55 to +150	°C

*Repetitive rating : Pulse width limited by max. junction temperature

THERMAL CHARACTERISTIC

SYMBOL	CHARACTERISTIC	MAX.	UNIT
R_{thJC}	Thermal Resistance, Junction to Case	0.19	°C/W
R_{thJC}	(IGBT) Thermal Resistance, Junction to.....	0.62	°C/W
R_{thJA}	(DIODE) Thermal Resistance,Junction to Ambient	31	°C/W

General Description

SIRECTIFIER Trench Field Stop IGBTs offer low switching losses, high energy efficiency and short circuit ruggedness.
It is designed for applications such as motor control, uninterrupted power supplies(UPS), general inverters.

FEATURES

- High speed switching
- High ruggedness, temperature stable behavior
- Short Circuit Withstand Times ＞10us
- Extremely enhanced avalanche capability

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SG100T65UDB3

Discrete IGBTs

ELECTRICAL CHARACTERISTICS (Ta=25°C)

SYMBOL	CHARACTERISTIC	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Static						
BV_{CES}	Collector-Emitter Breakdown Voltage	V_{GE}=0V , I_C=250μA	650		-	V
I_{CES}	Collector Cut-off Current	V_{GE}=0V, V_{CE}=600V	-	-	250	μA
I_{GES}	Gate Leakage Current	V_{CE}=0V, V_{GE}=±20V	-	-	±100	nA
$V_{GE(th)}$	Gate Threshold Voltage	V_{GE}=V_{CE}, I_C=7.5mA	5.0	6.0	7.5	V
$V_{CE(sat)}$	Collector-Emitter Satura	V_{GE}=15V, I_C=100A	-	1.85	2.20	V
		V_{GE}=15V, I_C=200A	-	2.30	-	V
		V_{GE}=15V, I_C=100A, T_C = 125°C	-	2.10	-	V
Dynamic						
Q_g	Total Gate Charge	V_{CC}=300V, V_{GE}=15V, I_C= 100A	-	650	-	nC
Q_{ge}	Gate-Emitter Charge		-	50	-	nC
Q_{gc}	Gate-Collector Charge		-	140	-	nC
$t_{d(on)}$	Turn-On Delay Time	V_{CC}=300V, I_C=100A, V_{GE}=15V, R_G=10Ω Inductive Load, T_C = 25°C (Note 1)	-	30	-	ns
t_r	Rise Time		-	50	-	ns
$t_{d(off)}$	Turn-Off Delay Time		-	260	-	ns
t_f	Turn-Off Delay Time		-	35	-	ns
E_{on}	Turn-On Switching Loss		-	3.9	-	mJ
E_{off}	Turn-Off Switching Loss		-	2.05	-	mJ
E_{ts}	Total Switching Loss		-	5.95	-	mJ
$t_{d(on)}$	Turn-On Delay Time	V_{CC}=300V, I_C=100A, V_{GE}=15V, R_G=10Ω Inductive Load, T_C = 125°C (Note 1)	-	30	-	ns
t_r	Rise Time		-	50	-	ns
$t_{d(off)}$	Turn-Off Delay Time		-	340	-	ns
t_f	Turn-Off Delay Time		-	30	-	ns
E_{on}	Turn-On Switching Loss		-	5.0	-	mJ
E_{off}	Turn-Off Switching Loss		-	2.35	-	mJ
E_{ts}	Total Switching Loss		-	7.35	-	mJ
C_{ies}	Input Capacitance	V_{CE}=30V, V_{GE}=0V, f=1MHz	-	6040	-	pF
C_{oes}	ouput Capacitance		-	200	-	pF
C_{res}	Reverse Transfer Capac		-	170	-	pF
t_{sc}	Short Circuit Withstand	V_{CC}=300V, V_{GE}=15V, T_C=100°C	10	-	-	μs

Note 1 : Energy loss include tail current and diode reverse recovery.

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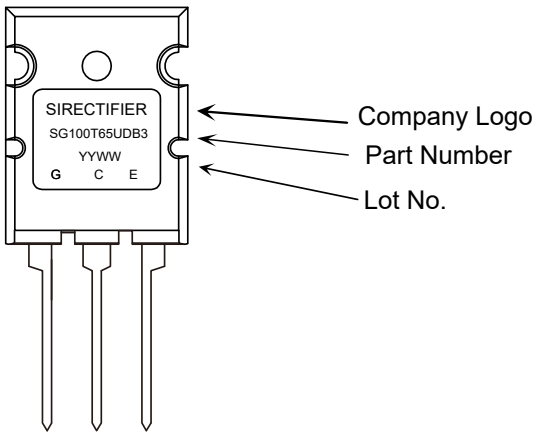
Discrete IGBTs

ELECTRICAL CHARACTERISTIC OF DIODE

SYMBOL	CHARACTERISTIC	TEST CONDITION		MIN.	TYP.	MAX.	UNIT
V_F	Diode Forward Voltage	I_F = 100A	T_C=25°C	-	1.75	2.1	V
			T_C=125°C	-	1.65	-	
t_{rr}	Diode Reverse Recovery Time	V_{CC}=300V, I_F=100A di/dt = 600A/μs	T_C=25°C	-	170	-	ns
			T_C=125°C	-	230	-	
I_{rr}	Diode Peak Reverse Recovery Current		T_C=25°C	-	25	-	A
			T_C=125°C	-	23	-	
Q_{rr}	Diode Reverse Recovery Charge		T_C=25°C	-	2.2	-	μC
			T_C=125°C	-	3.2	-	

MARKING



ORDERING INFORMATION

Part Number	Package	Shipping	Marking Code
SG100T65UDB3	TO-264	20pcs / Tube	SG100T65UDB3

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SG100T65UDB3

Discrete IGBTs

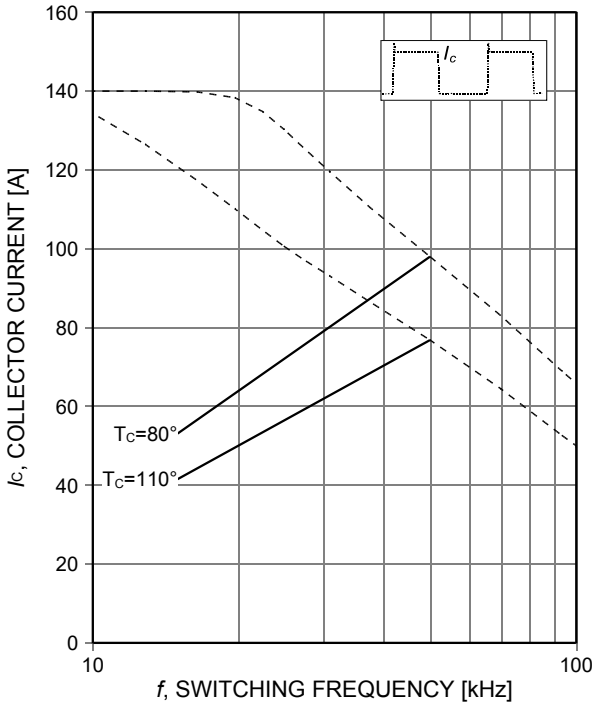

Figure 1. **Collector current as a function of switching frequency**
(T_{vj}≤175°C,D=0.5,V_{CE}=400V,V_{GE}=15/0V, r_G=3.5Ω,$R_{th(j-c)}$=0.21K/W)

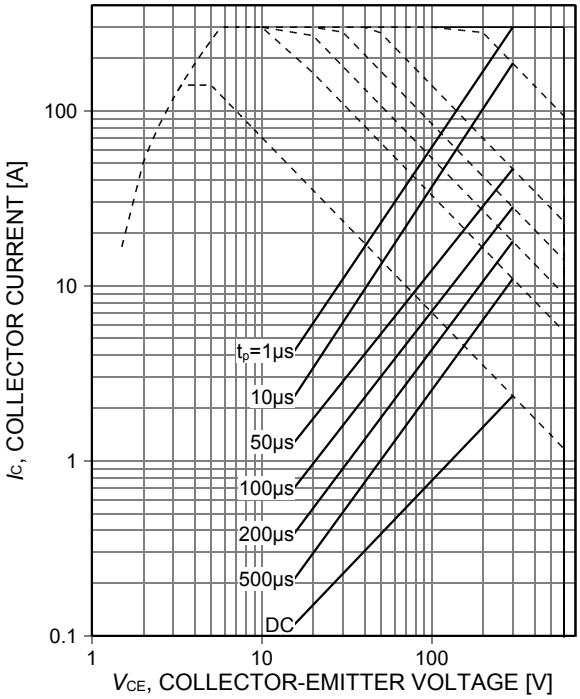

Figure 2. **Forward bias safe operating area**
(D=0,T_C=25°C,T_{vj}≤175°C;V_{GE}=15V, $R_{th(j-c)}$=0.21K/W)

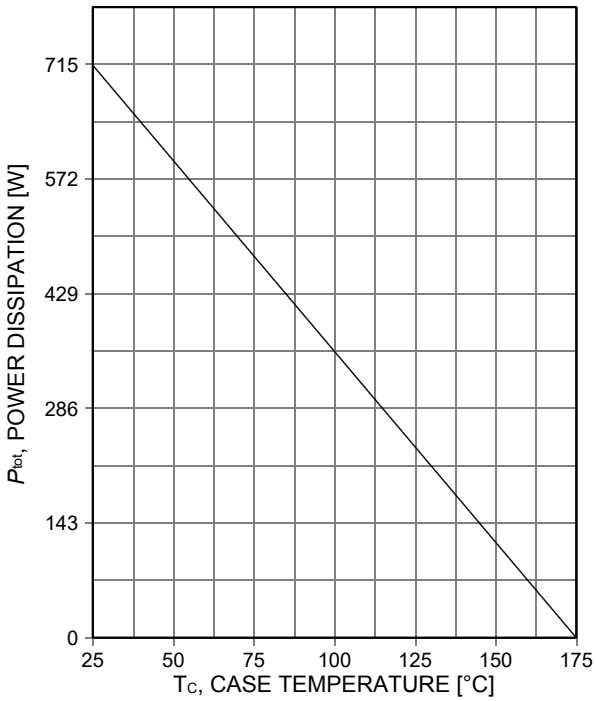

Figure 3. **Power dissipation as a function of case temperature**
(T_{vj}≤175°C,$R_{th(j-c)}$=0.21K/W)

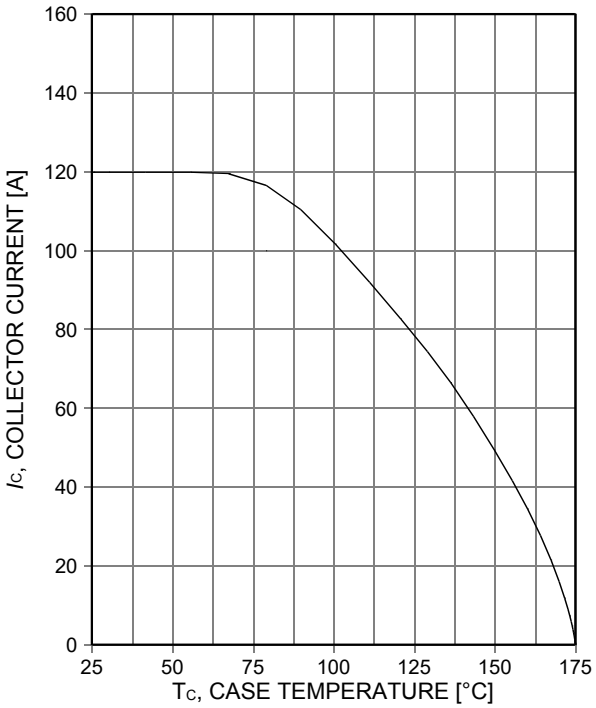

Figure 4. **Collector current as a function of case temperature**
(V_{GE}≥15V,T_{vj}≤175°C,$R_{th(j-c)}$=0.21K/W)

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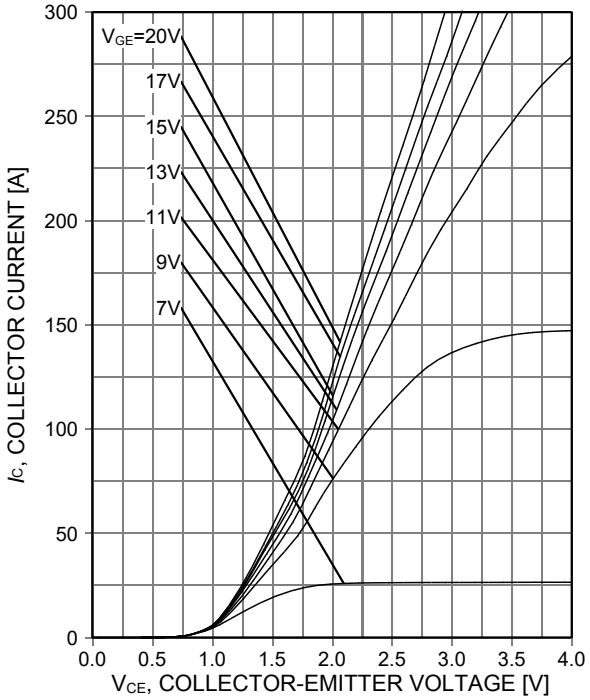

Figure 5. **Typical output characteristic**
(T_{vj}=25°C)

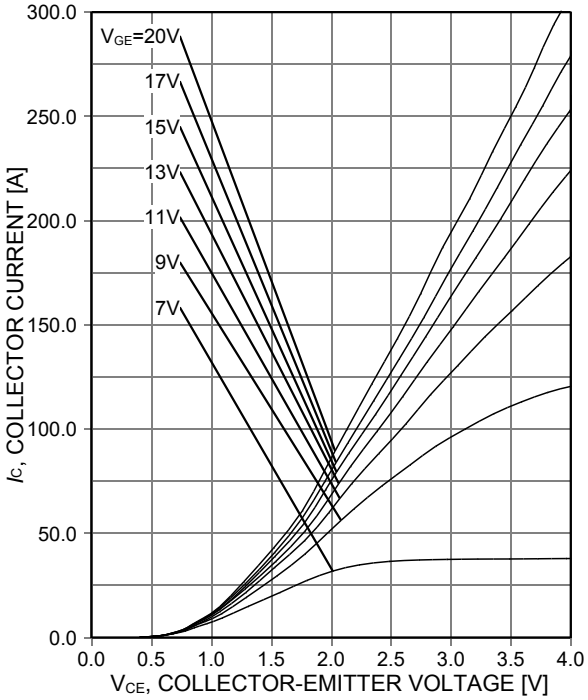

Figure 6. **Typical output characteristic**
(T_{vj}=175°C)

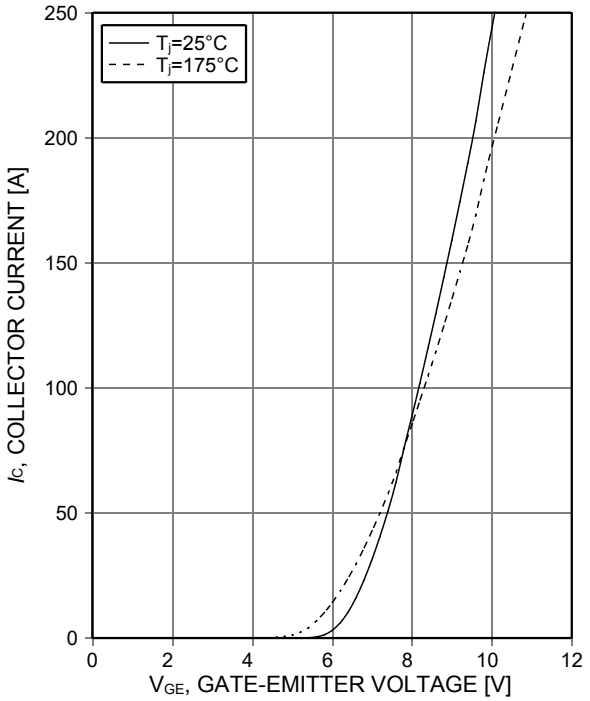

Figure 7. **Typical transfer characteristic**
(V_{CE}=20V)

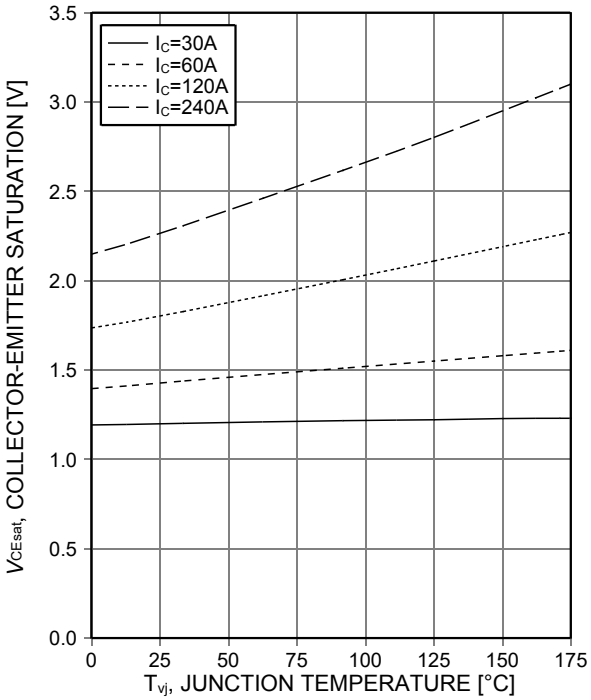

Figure 8. **Typical collector-emitter saturation voltage as a function of junction temperature**
(V_{GE}=15V)

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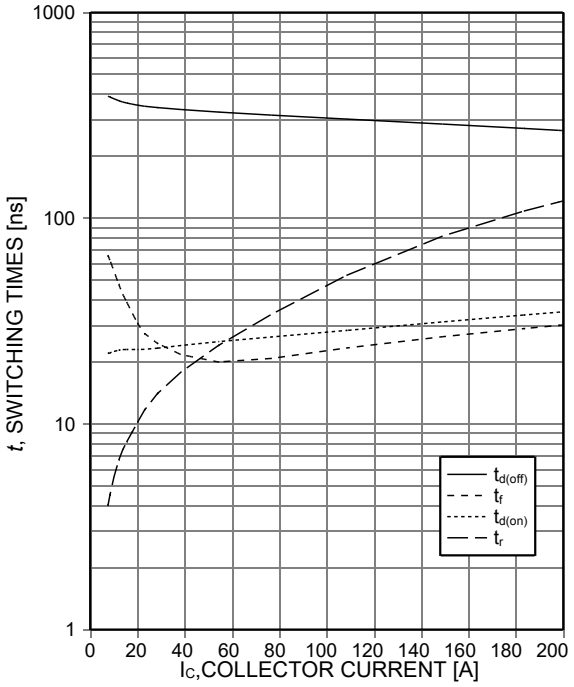

Figure 9. **Typical switching times as a function of collector current**
(inductive load,T_{vj}=175°C,V_{CE}=400V, V_{GE}=15/0V,r_G=3.5Ω,Dynamic test circuit in Figure E)

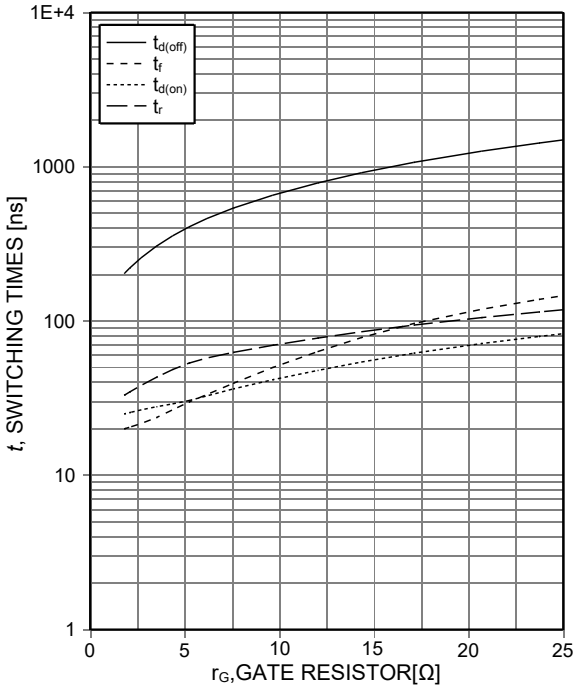

Figure 10. **Typical switching times as a function of gate resistor**
(inductive load,T_{vj}=175°C,V_{CE}=400V, V_{GE}=15/0V,I_C=100A,Dynamic test circuit in Figure E)

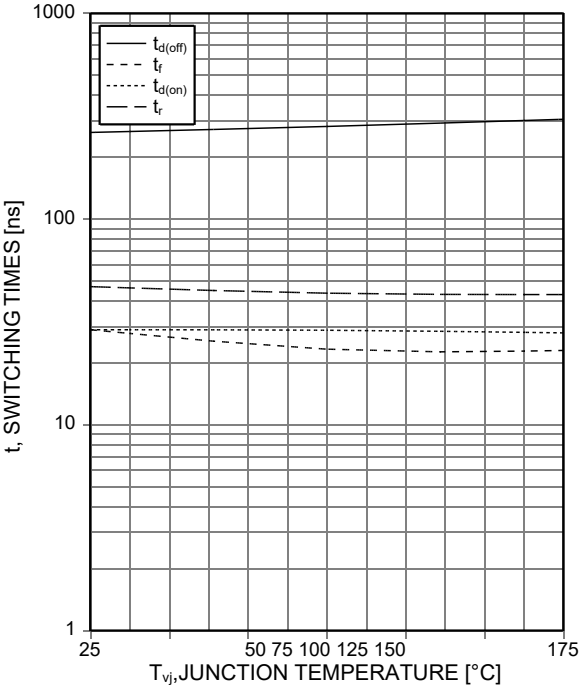

Figure 11. **Typical switching times as a function of junction temperature**
(inductive load,V_{CE}=400V,V_{GE}=15/0V, I_C=100A,r_G=3.5Ω,Dynamic test circuitin Figure E)

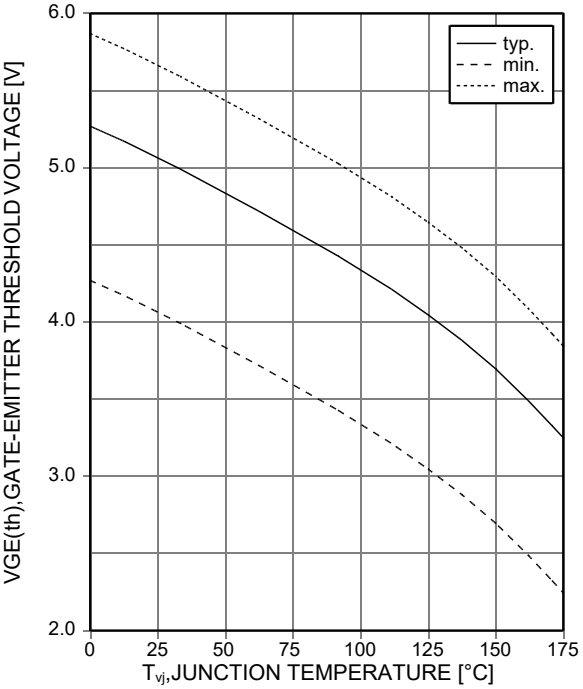

Figure 12. **Gate-emitter threshold voltage as a function of junction temperature**
(I_C=1.6mA)

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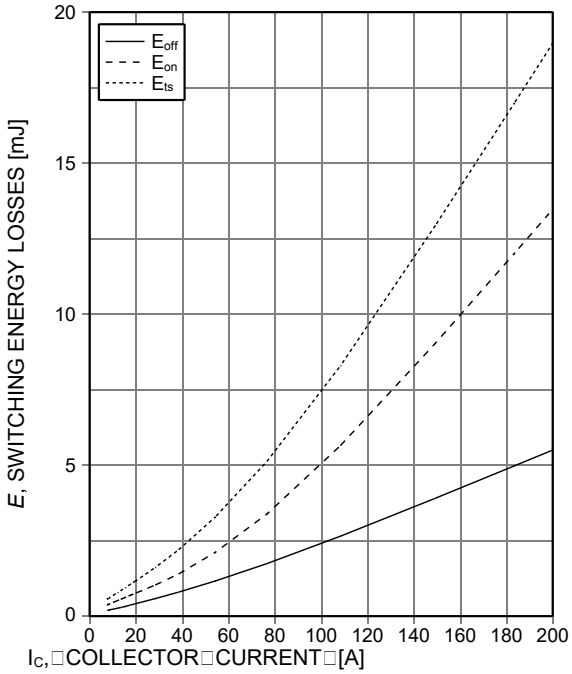

Figure 13. **Typical switching energy losses as a function of collector current**
(inductive load, T_{vj}=175°C, V_{CE}=400V, V_{GE}=15/0V, r_G=3.5Ω, Dynamic test circuit in Figure E)

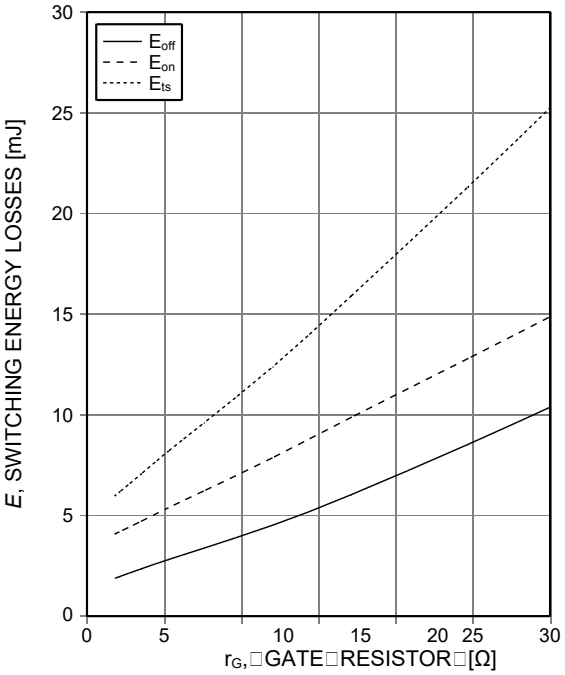

Figure 14. **Typical switching energy losses as a function of gate resistor**
(inductive load, T_{vj}=175°C, V_{CE}=400V, V_{GE}=15/0V, I_C=100A, Dynamic test circuit in Figure E)

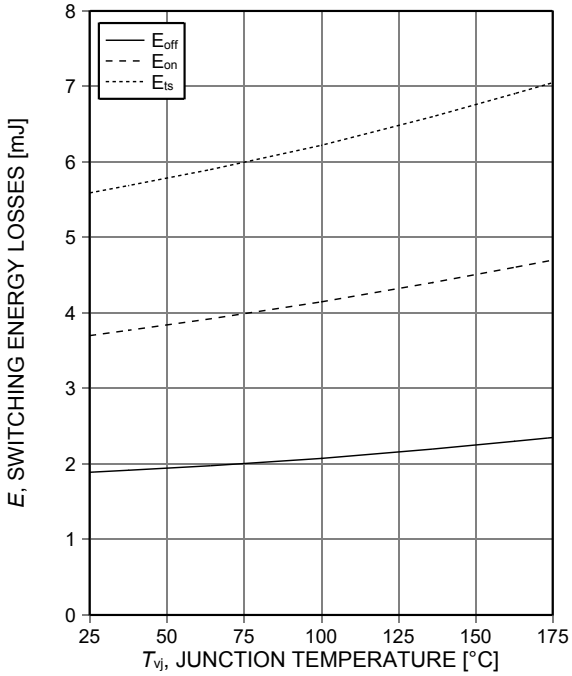

Figure 15. **Typical switching energy losses as a function of junction temperature**
(inductive load, V_{CE}=400V, V_{GE}=15/0V, I_C=100A, r_G=3.5Ω, Dynamic test circuit in Figure E)

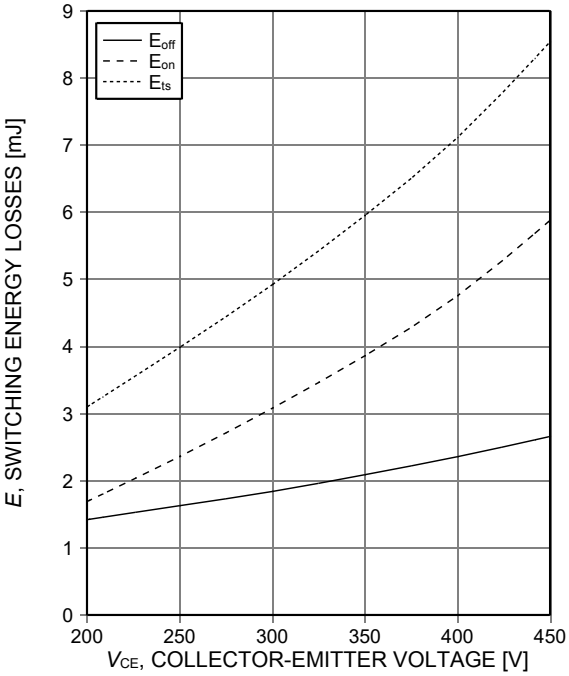

Figure 16. **Typical switching energy losses as a function of collectoremitter voltage**
(inductive load, T_{vj}=175°C, V_{GE}=15/0V, I_C=100A, r_G=3.5Ω, Dynamic test circuit in Figure E)

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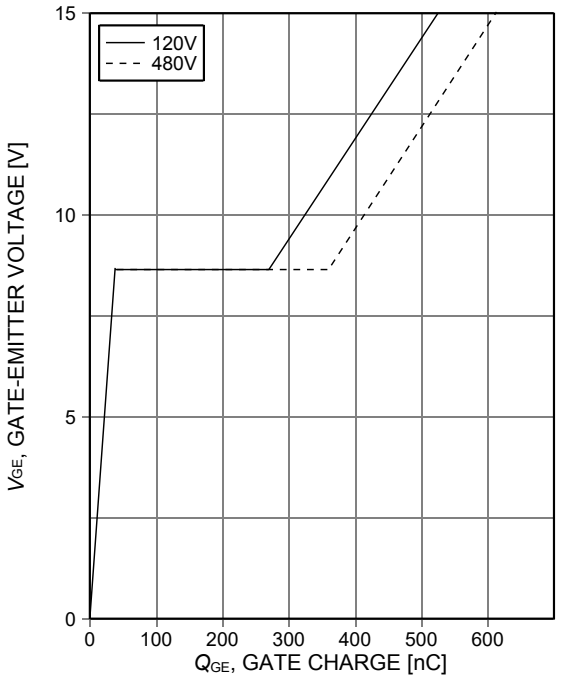

Figure 17. **Typical gate charge**
(I_C=100A)

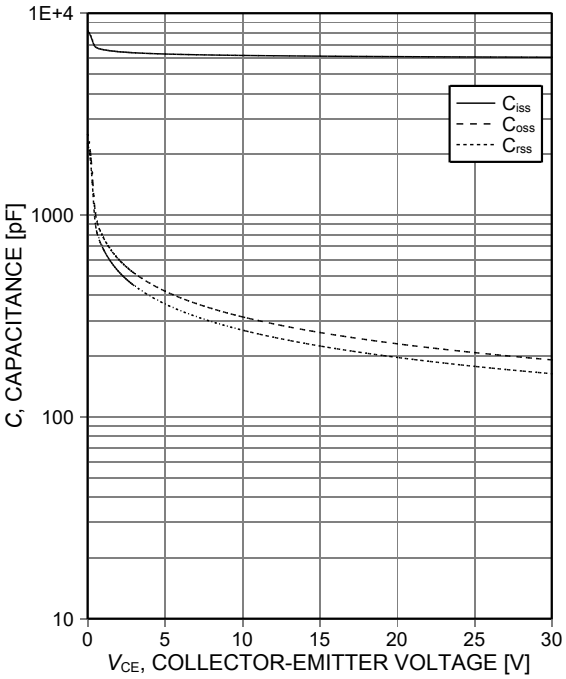

Figure 18. **Typical capacitance as a function of collector-emitter voltage**
(V_{GE}=0V, f=1MHz)

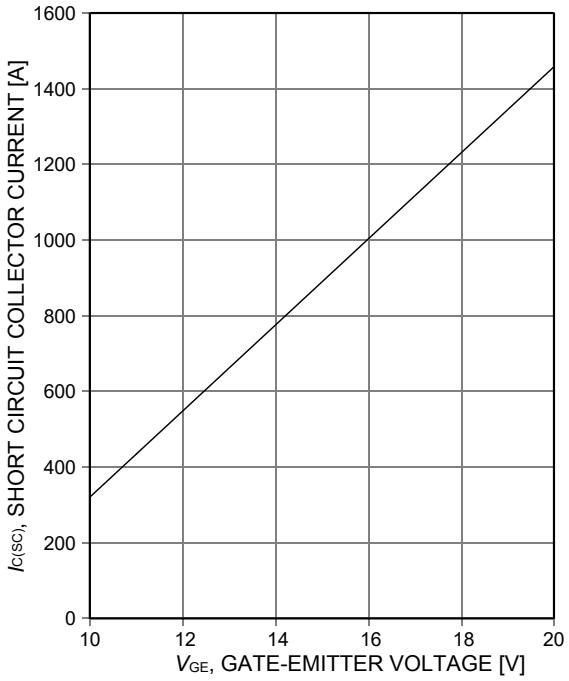

Figure 19. **Typical short circuit collector current as a function of gate-emitter voltage**
(V_{CE}≤400V, T_{vj}≤150°C)

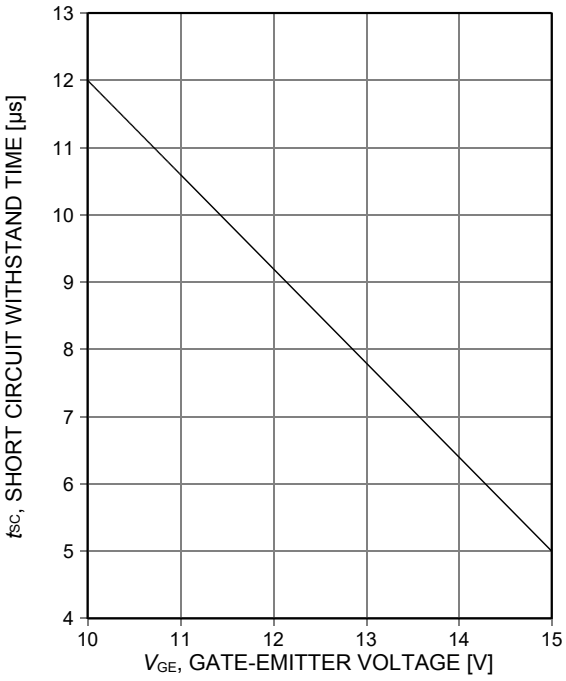

Figure 20. **Short circuit withstand time as a function of gate-emitter voltage**
(V_{CE}≤400V, start at T_{vj}≤150°C)

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