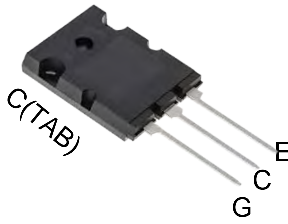
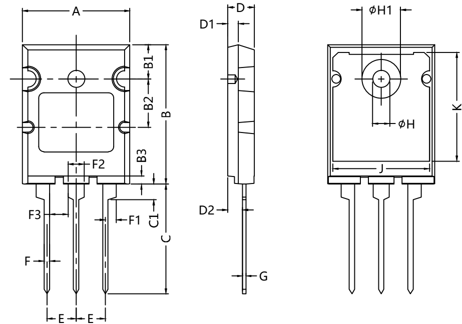
SG100T65UDB3

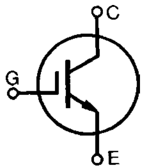
Discrete IGBTs

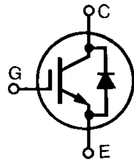


G=Gate,
C=Collector,
E=Emitter,
TAB=Collector

Dimensions TO-264







SG100T65UB3 **SG100T65UDB3**

MAXIMUM RATING (Ta=25℃)

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

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

THERMAL CHARACTERISTIC

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

CHARACTERISTIC	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Static						
Collector-Emitter Breakdown Voltage	BV_{CES}	V_{GE}=0V , I_C=250μA	650		-	V
Collector Cut-off Current	I_{CES}	V_{GE}=0V, V_{CE}=600V	-	-	250	μA
Gate Leakage Current	I_{GES}	V_{CE}=0V, V_{GE}=±20V	-	-	±100	nA
Gate Threshold Voltage	$V_{GE(th)}$	V_{GE}=V_{CE}, I_C=7.5mA	5.0	6.0	7.5	V
Collector-Emitter Saturation Voltage	$V_{CE(sat)}$	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						
Total Gate Charge	Q_g	V_{CC}=300V, V_{GE}=15V, I_C= 100A	-	650	-	nC
Gate-Emitter Charge	Q_{ge}		-	50	-	nC
Gate-Collector Charge	Q_{gc}		-	140	-	nC
Turn-On Delay Time	$t_{d(on)}$	V_{CC}=300V, I_C=100A, V_{GE}=15V, R_G=10Ω Inductive Load, T_C = 25°C (Note 1)	-	30	-	ns
Rise Time	t_r		-	5€	-	ns
Turn-Off Delay Time	$t_{d(off)}$		-	260	-	ns
Turn-Off Delay Time	t_f		-	3Í	-	ns
Turn-On Switching Loss	E_{on}		-	3.9	-	mJ
Turn-Off Switching Loss	E_{off}		-	2.05	-	mJ
Total Switching Loss	E_{ts}		-	5.95	-	mJ
Turn-On Delay Time	$t_{d(on)}$	V_{CC}=300V, I_C=100A, V_{GE}=15V, R_G=10Ω Inductive Load, T_C = 125°C (Note 1)	-	30	-	ns
Rise Time	t_r		-	50	-	ns
Turn-Off Delay Time	$t_{d(off)}$		-	340	-	ns
Turn-Off Delay Time	t_f		-	30	-	ns
Turn-On Switching Loss	E_{on}		-	5.0	-	mJ
Turn-Off Switching Loss	E_{off}		-	2.35	-	mJ
Total Switching Loss	E_{ts}		-	7.35	-	mJ
Input Capacitance	C_{ies}	V_{CE}=30V, V_{GE}=0V, f=1MHz	-	6040	-	pF
ouput Capacitance	C_{oes}		-	200	-	pF
Reverse Transfer Capacitance	C_{res}		-	170	-	pF
Short Circuit Withstand Time	t_{sc}	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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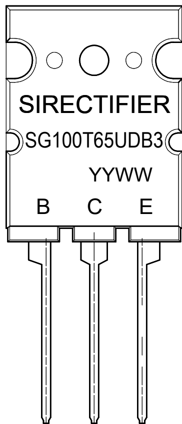
ELECTRICAL CHARACTERISTIC OF DIODE

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

MARKING



Company Logo
Part Number
Lot No.

ORDERING INFORMATION

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

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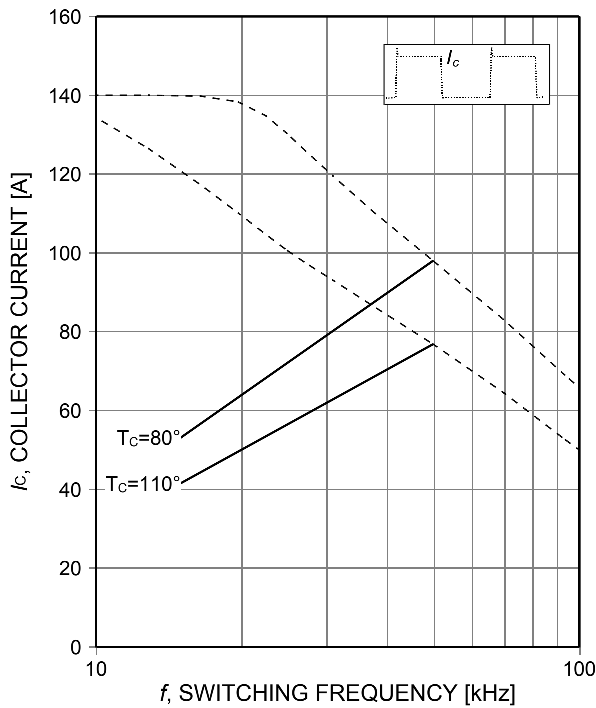

Figure 1. **Collector current as a function of switching frequency**
(T_{vj}≤175°C,D=0.5,V_{CE}=400V,V_{GE}=15/0V, r_G=3.5Ω,$R_{th(j-c)}$=0.21K/W)

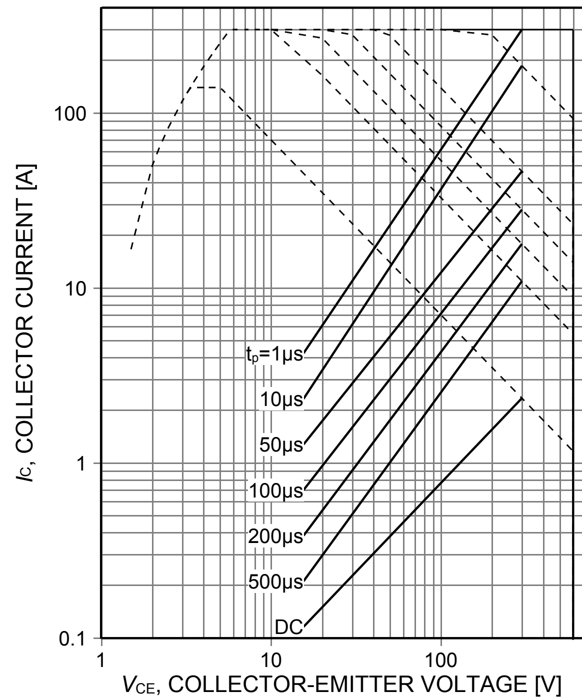

Figure 2. **Forward bias safe operating area**
(D=0,T_C=25°C,T_{vj}≤175°C;V_{GE}=15V, $R_{th(j-c)}$=0.21K/W)

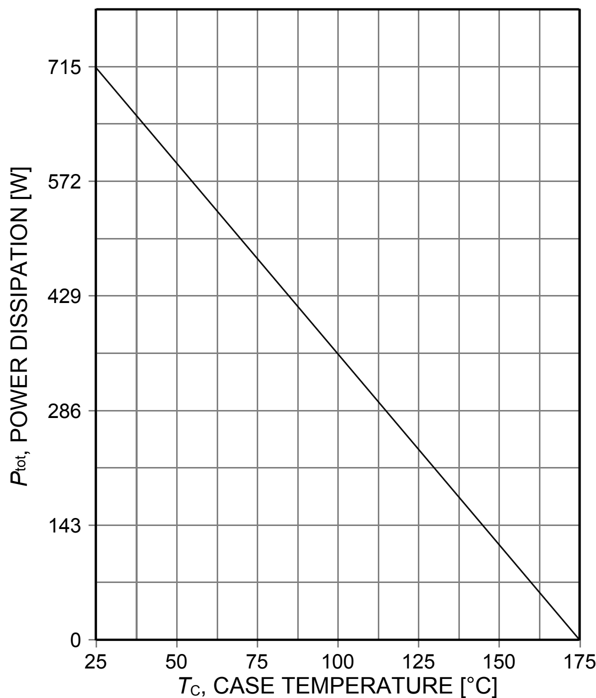

Figure 3. **Power dissipation as a function of case temperature**
(T_{vj}≤175°C,$R_{th(j-c)}$=0.21K/W)

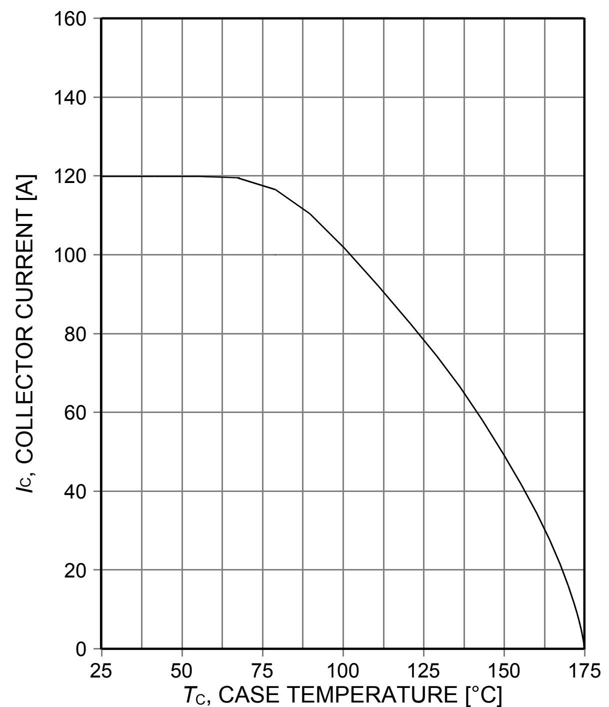

Figure 4. **Collector current as a function of case temperature**
(V_{GE}≥15V,T_{vj}≤175°C,$R_{th(j-c)}$=0.21K/W)

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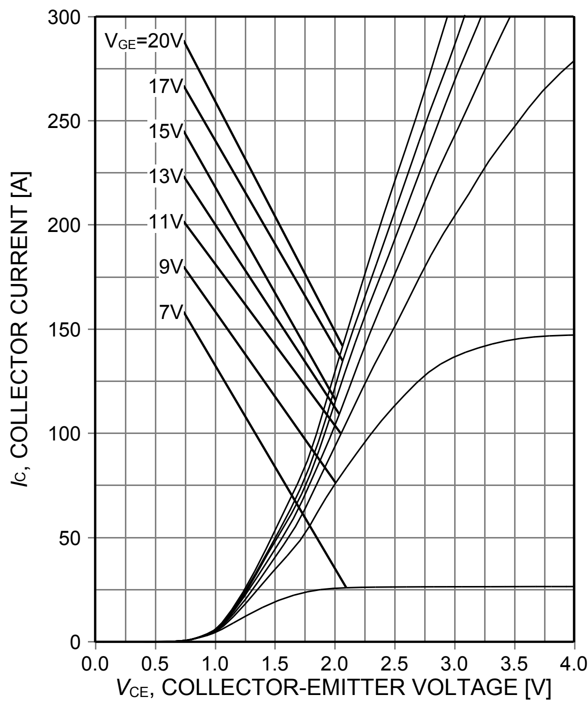

Figure 5. **Typical output characteristic**
(T_{vj}=25°C)

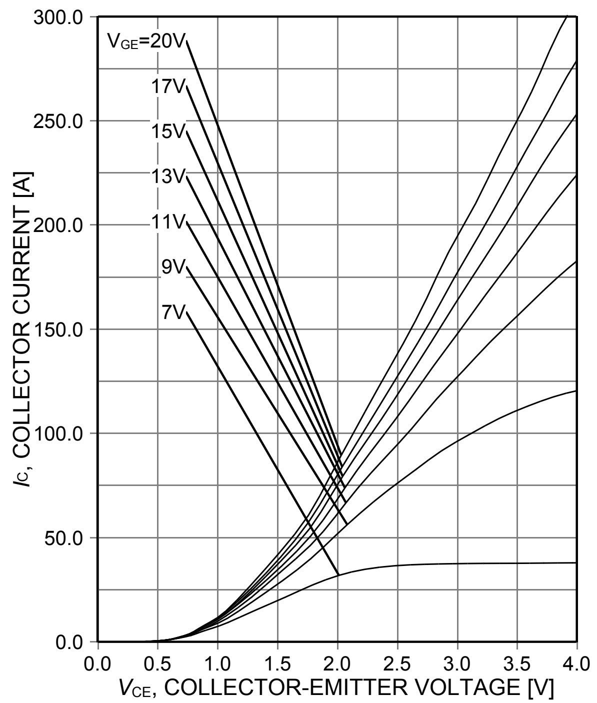

Figure 6. **Typical output characteristic**
(T_{vj}=175°C)

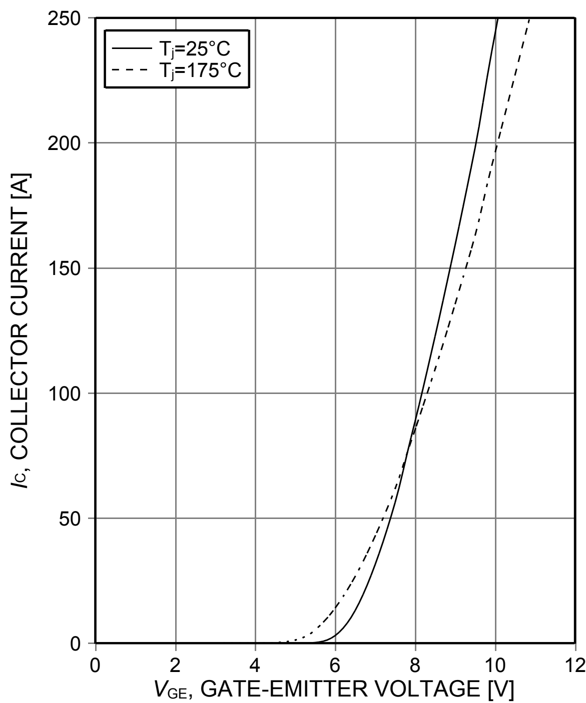

Figure 7. **Typical transfer characteristic**
(V_{CE}=20V)

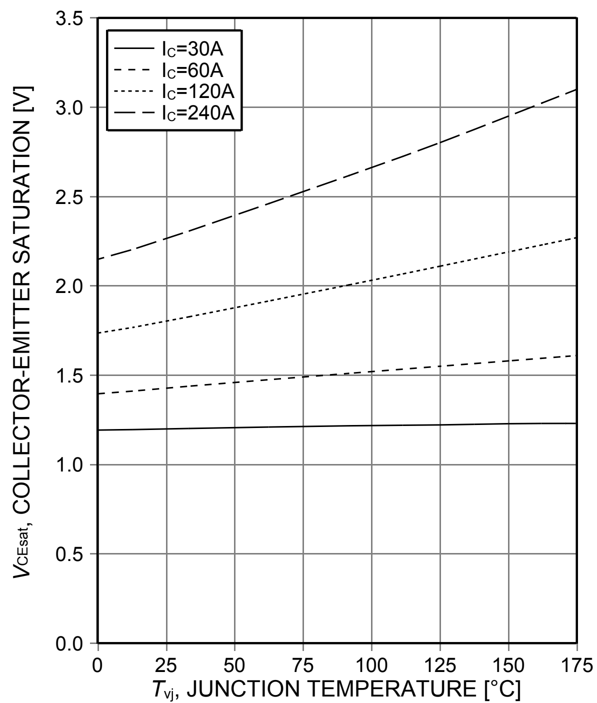

Figure 8. **Typical collector-emitter saturation voltage as a function of junction temperature**
(V_{GE}=15V)

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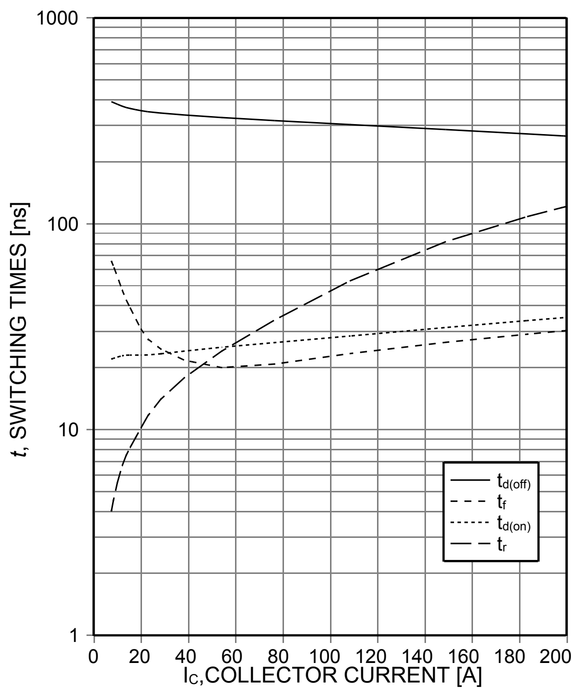

Figure 9. **Typical switching times as a function of collector current**
(inductive load,T_{vj}=175°C,V_{CE}=400V, V_{GE}=15/0V,r_G=3.5Ω,Dynamic test circuit in Figure E)

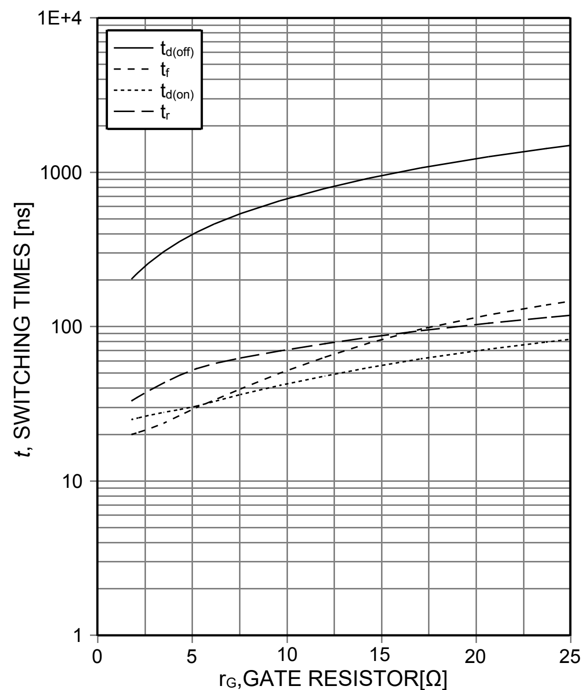

Figure 10. **Typical switching times as a function of gate resistor**
(inductive load,T_{vj}=175°C,V_{CE}=400V, V_{GE}=15/0V,I_C=100A,Dynamic test circuit in Figure E)

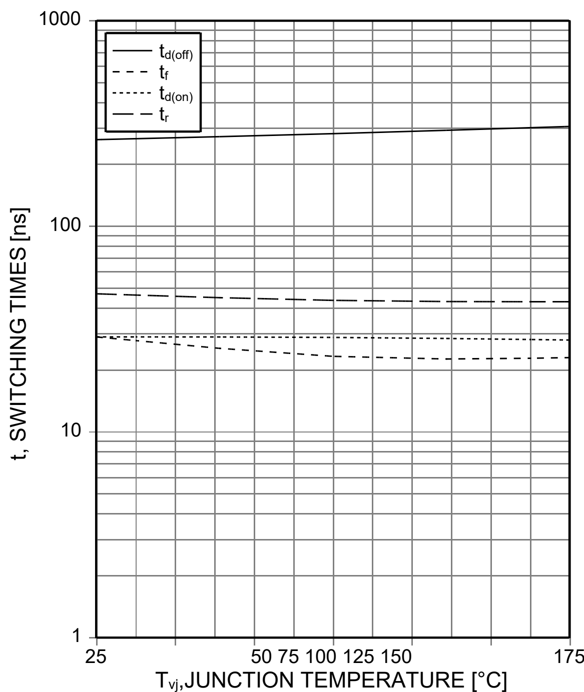

Figure 11. **Typical switching times as a function of junction temperature**
(inductive load,V_{CE}=400V,V_{GE}=15/0V, I_C=100A,r_G=3.5Ω,Dynamic test circuitin Figure E)

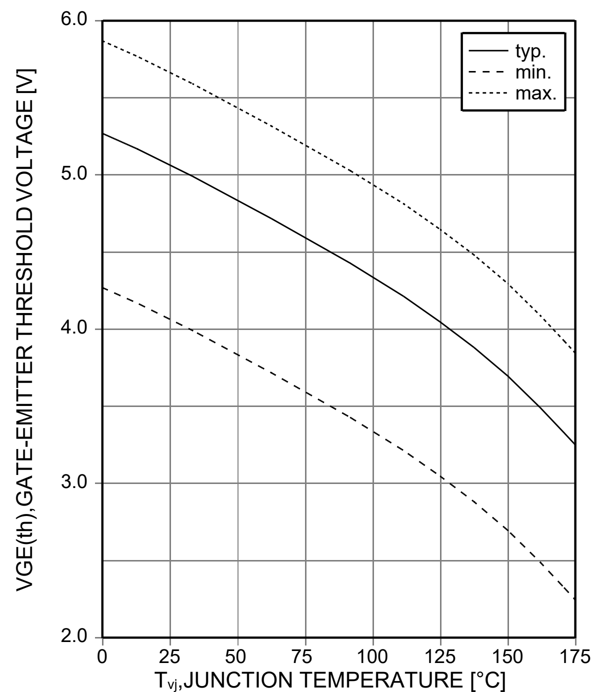

Figure 12. **Gate-emitter threshold voltage as a function of junction temperature**
(I_C=1.6mA)

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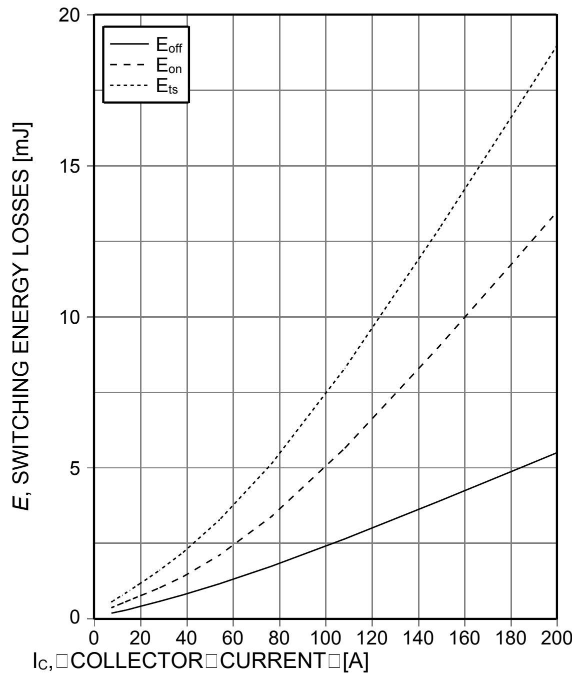

Figure 13. **Typical switching energy losses as a function of collector current**
(inductive load, T_{vj}=175°C, V_{CE}=400V, V_{GE}=15/0V, r_G=3.5Ω, Dynamic test circuit in Figure E)

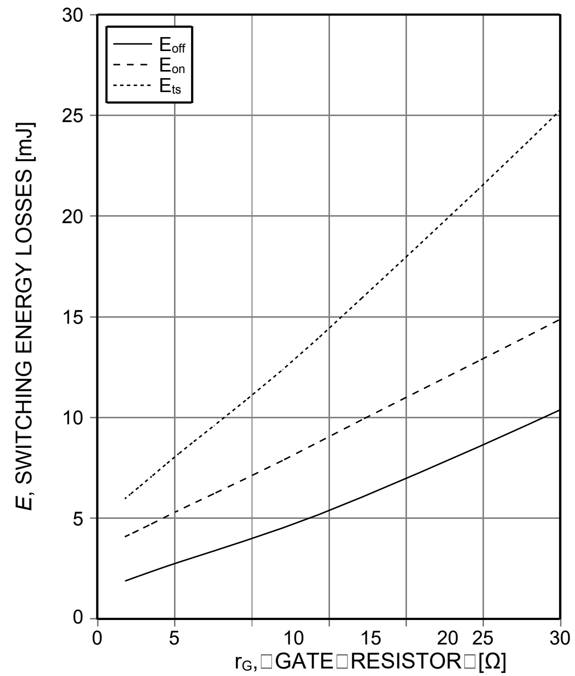

Figure 14. **Typical switching energy losses as a function of gate resistor**
(inductive load, T_{vj}=175°C, V_{CE}=400V, V_{GE}=15/0V, I_C=100A, Dynamic test circuit in Figure E)

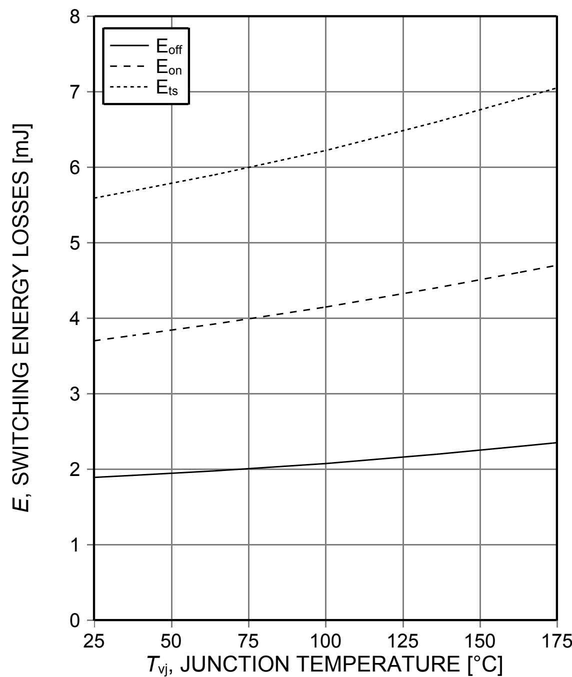

Figure 15. **Typical switching energy losses as a function of junction temperature**
(inductive load, V_{CE}=400V, V_{GE}=15/0V, I_C=100A, r_G=3.5Ω, Dynamic test circuit in Figure E)

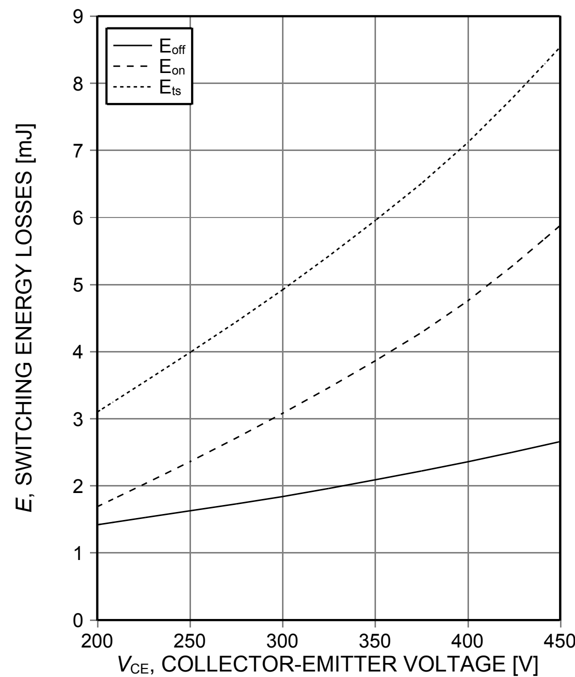

Figure 16. **Typical switching energy losses as a function of collectoremitter voltage**
(inductive load, T_{vj}=175°C, V_{GE}=15/0V, I_C=100A, r_G=3.5Ω, Dynamic test circuit in Figure E)

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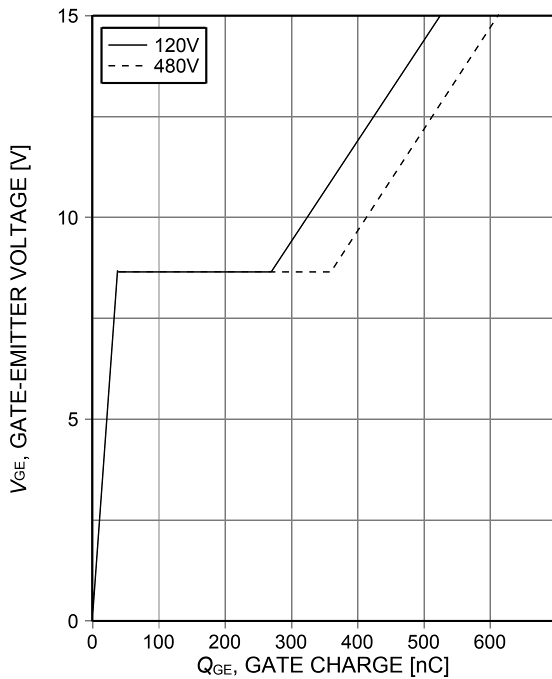

Figure 17. **Typical gate charge**
(I_C=100A)

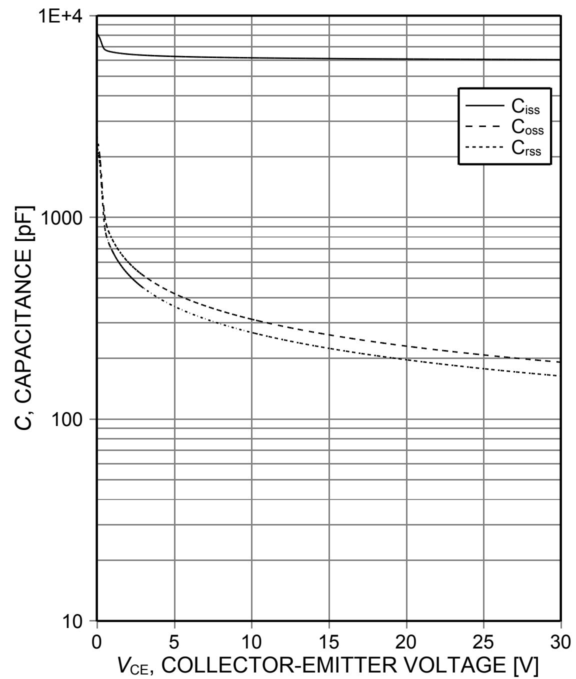

Figure 18. **Typical capacitance as a function of collector-emitter voltage**
(V_{GE}=0V, f=1MHz)

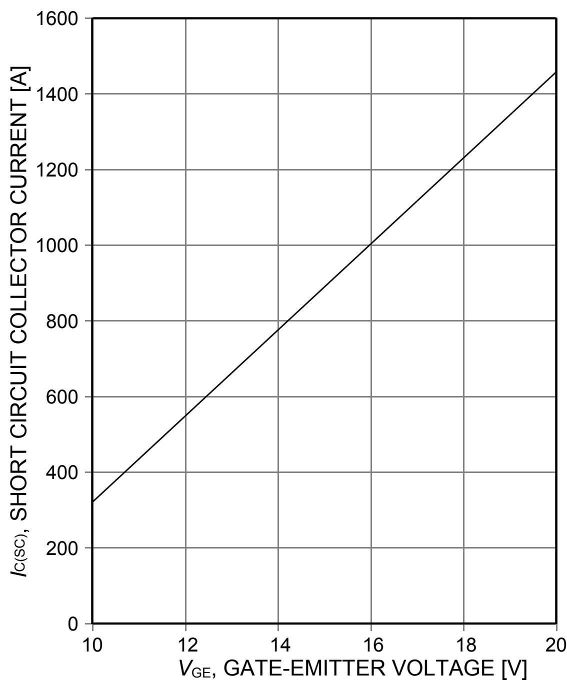

Figure 19. **Typical short circuit collector current as a function of gate-emitter voltage**
(V_{CE}≤400V, T_{vj}≤150°C)

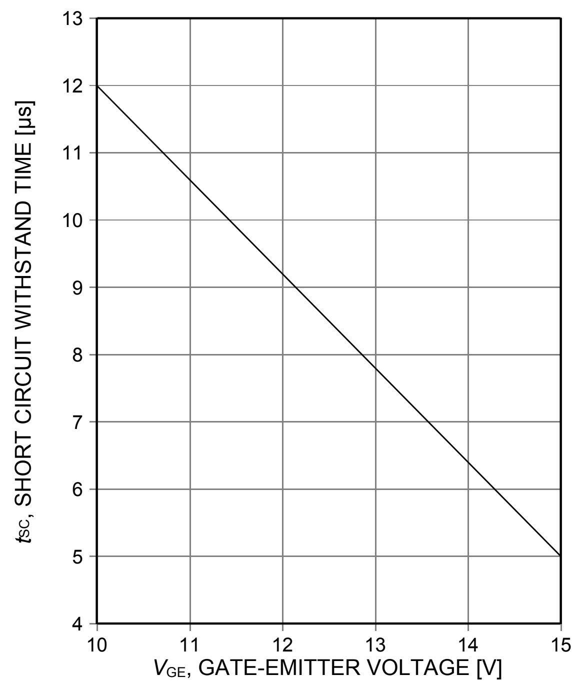

Figure 20. **Short circuit withstand time as a function of gate-emitter voltage**
(V_{CE}≤400V, start at T_{vj}≤150°C)

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