SIEMENS

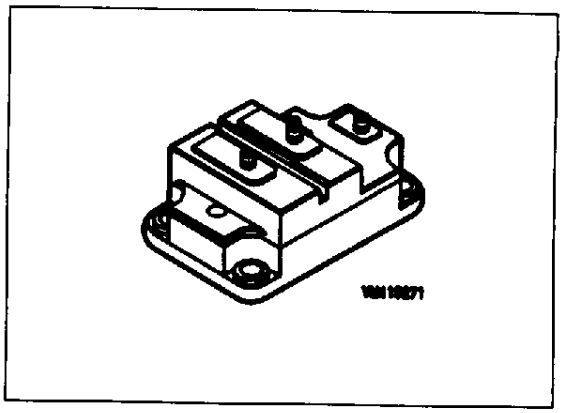
BSM 200 GA 160 D

IGBT Module®

200ga16a.doc

V_{CE}= 1600 V
I_C = 275 A at T_C =25°C
I_C = 200 A at T_C =80°C

- Power module
- Single switch
- Including fast free-wheel diodes
- Package with insulated metal base plate



Single switch			
Type	**Ordering code**	**Type**	**Ordering code**
BSM 200 GA 160D	C67076-A2114-A2		

Maximum Ratings

Parameter		Symbol	Values	Unit
Collector emitter voltage		V_{CE}	1600	V
Collector gate voltage, R_{GE}=20kΩ		V_{CGR}	1600	
Gate-Emitter voltage		V_{GE}	±20	
Continuous collector current	T_C=25ºC	I_C	275	A
	T_C=80ºC		200	
Pulsed collector current	T_C=25ºC	$I_{C\,puls}$	550	
	T_C=80ºC		400	
Operating and storage temperature range		T_j, T_{stg}	-55...+150	°C
Power dissipation, T_C = 25°C		P_{tot}	1750	W
Thermal resistance, chip-case		R_{thJC}	≤0.07	K/W
Insulation test voltage[1], t=1min.		V_{is}	4000	Vac
Creepage distance		-	20	mm
Clearance		-	11	
DIN humidity category, DIN 40 040		-	F	--
IEC climatic category, DIN IEC 68-1		-	55/150/56	

[1] Insulation test voltage between collector and metal base plate referred to standard climate 23/50 in acc.with DIN 50 014, IEC,para 492.1.

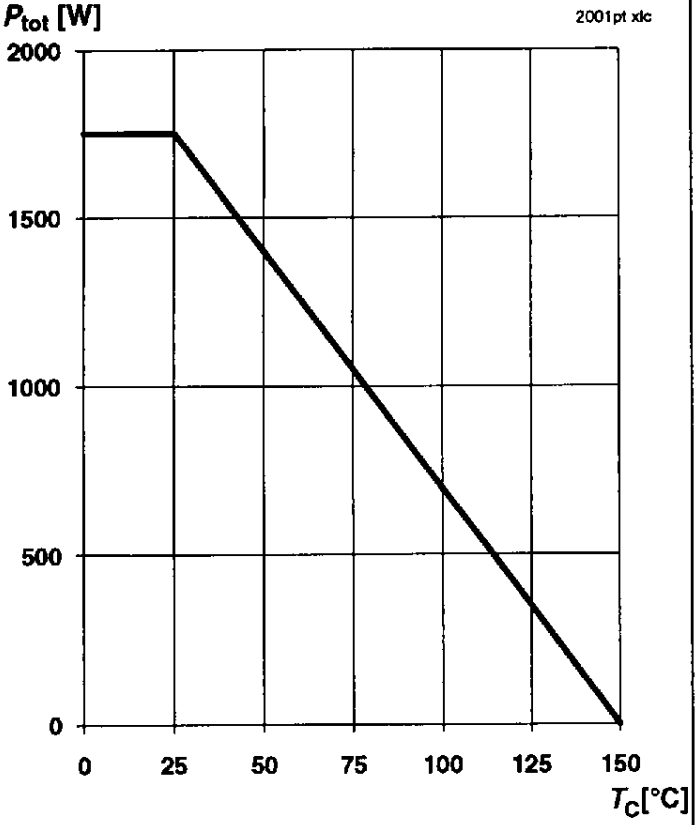
Electrical Characteristics

Parameter and conditions at T_j = 25 °C, unless otherwise specified	Symbol	Values			Unit
		min	typ	max	
Static Characteristics					
Collector-emitter breakdown voltage V_{GE} =0,IC=4mA	$V_{(BR)CES}$	1600	-	-	V
Gate threshold voltage V_{GE}=V_{CE},IC=16mA	$V_{GE(th)}$	4.8	5.5	6.2	
Collector-emitter saturation voltage VGE=15V,IC=200 A	$V_{CE(sat)}$				
Tj =25°C		--	3.5	--	
Tj =125°C		--	4.2	--	
Tj =150°C		--	4.4	--	
Zero gate voltage collector current VCE=1600V,VGE=0V	I_{CES}				µA
Tj =25°C		--	1000	--	
Tj =125°C		--	4500	--	
Gate-emitter leakage current VGE=25V,VCE=0V	I_{CES}	--	--	100	nA
AC Characteristics					
Forward transconductance VCE=20V,IC=200 A	g_{fs}	72	--	--	S
Input capacitance VCE=25V,VGE=0V,f=1MHz	C_{iss}	--	32	--	nF
Output capacitance VCE=25V,VGE=0V,f=1MHz	C_{oss}	--	2.6	--	
Reverse transfer capacitance VCE=25V,VGE=0V,f=1MHz	C_{rss}	--	1.0	--	

Parameter and conditions at T_j = 25 °C, unless otherwise specified	Symbol	Values			Unit
		min	typ	max	
Switching Characteristics, Inductive Load					
at TJ=125°C					
Turn on delay time VCC=1200V,VGE=+15V,IC=200 A RG(on)=15Ω	$t_{d(on)}$	--	0.85	--	µs
Rise time VCC=1200V,VGE=+15V,IC=200 A RG(on)=15Ω	t_r	--	0.3	--	µs
Turn off delay time VCC=1200V,VGE=-15V,IC=200 A RG(off)=3.3Ω	$t_{d(off)}$	--	2.5	--	µs
Fall time VCC=1200V,VGE=-15V,IC=200 A RG(off)=3.3Ω	t_f	--	0.15	--	µs
Free-Wheel Diode					
Diode forward voltage IF=200 A,VGE=0V	V_F				V
Tj=25°C		--	4.2	--	
Tj=125°C		--	3.8	--	
Reverse recovery time IF=200 A,VR=-1200V VGE=0V,diF/dt=-1000A/µs	t_{rr}				µs
Tj=125°C		--	0.5	--	
Reverse recovery Charge IF=200 A,VR=-1200V VGE=0V,diF/dt=-1000A/µs	Q_{rr}				µC
Tj=125°C		--	--	--	
Thermal resistance Chip-Case	R_{thJC}	--	--	0.25	K/W

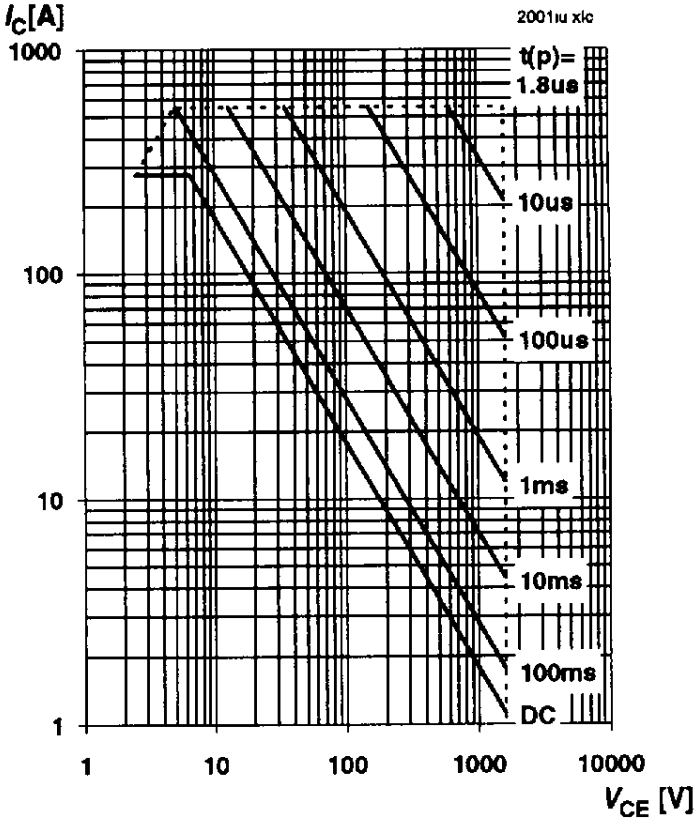
Power dissipation

$P_{tot} = f(T_C)$



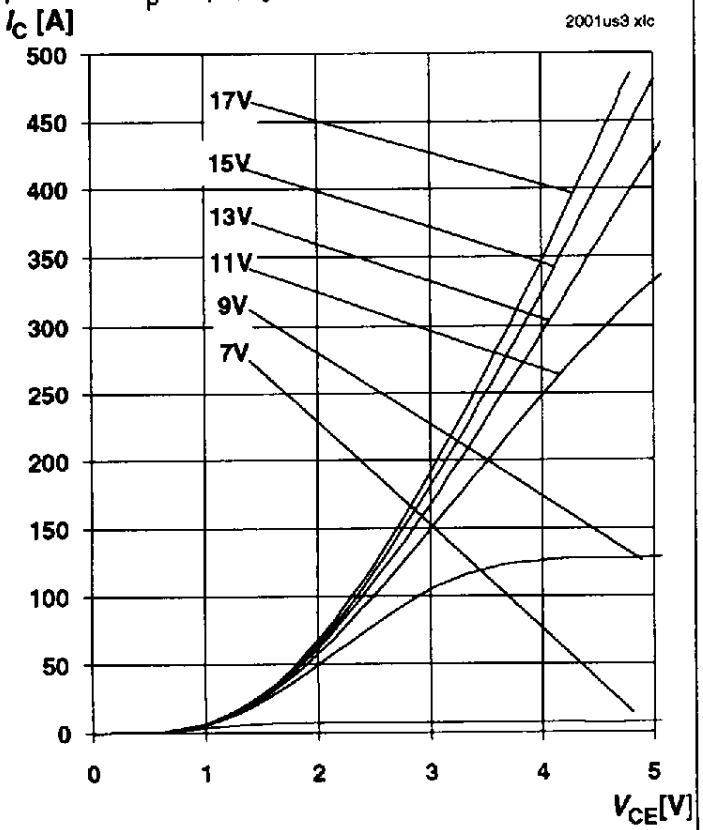
Safe operating area $I_C = f(V_{CE})$

parameter:single pulse, T_C=25°C, $T_J \leq 150$°C



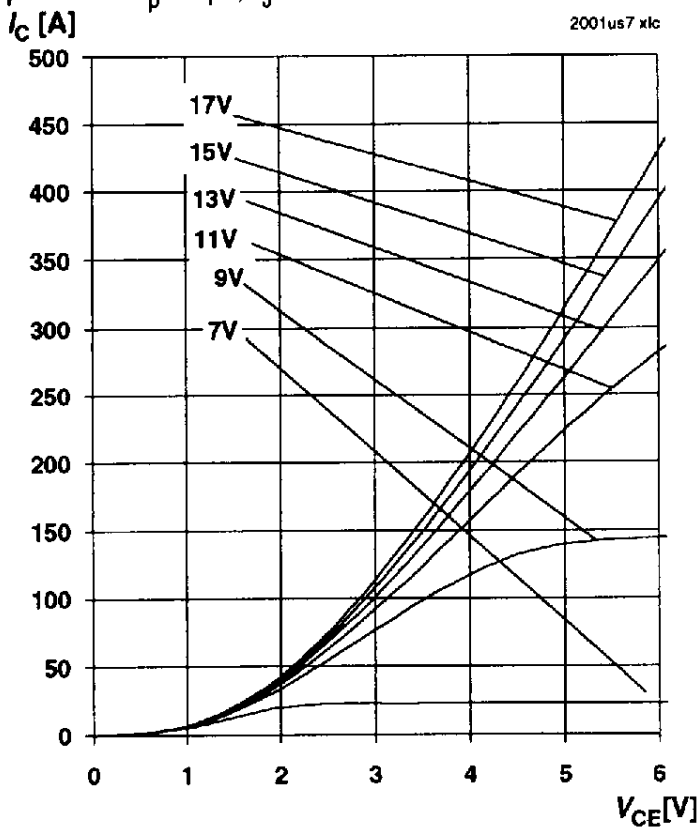
Typ output characteristics $I_C = f(V_{CE})$

parameter:t_p=80µs; T_J=25°C



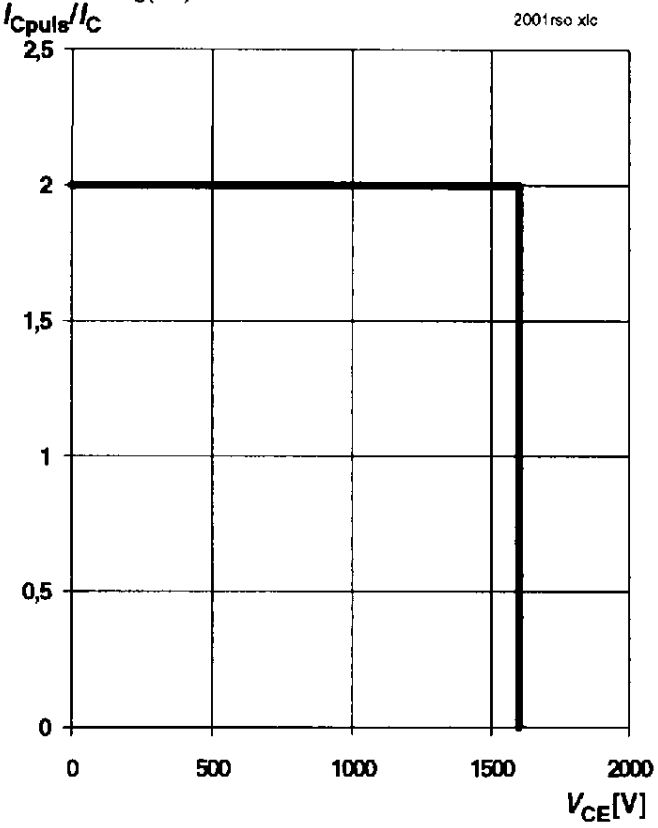
Typ output characteristics $I_C = f(V_{CE})$

parameter:t_p=80µs; T_J<125°C



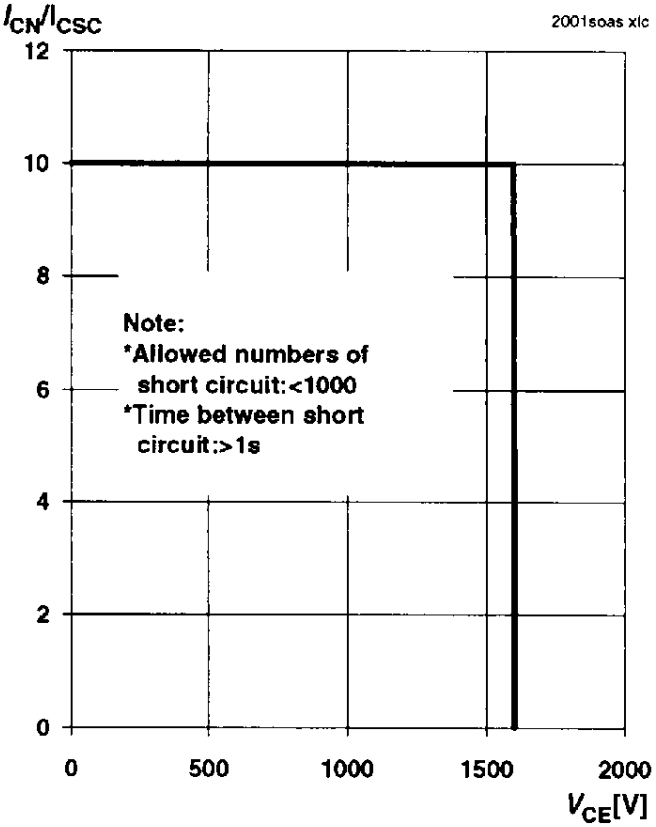
Reverse biased safe opererating area

$I_C=f(V_{CE})$,parameter: T_J=150°C
V_{GE}=15V, $R_{g(off)}$=3.3Ω



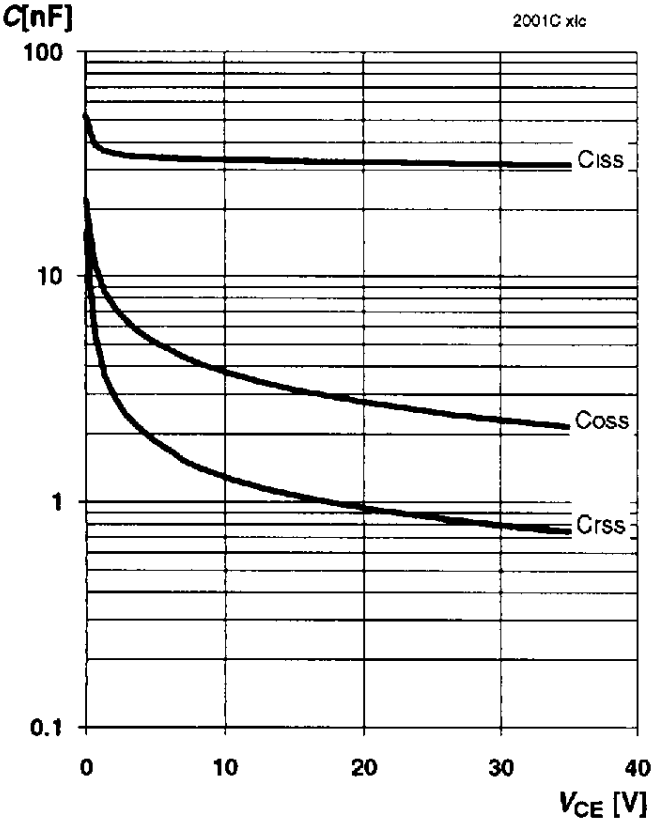
Safe operating area,SHORT CIRCUIT

$I_C=f(V_{CE})$, V_{GE}=±15V, T_J≤150°C
t_{sc}≤10µs, L<50nH



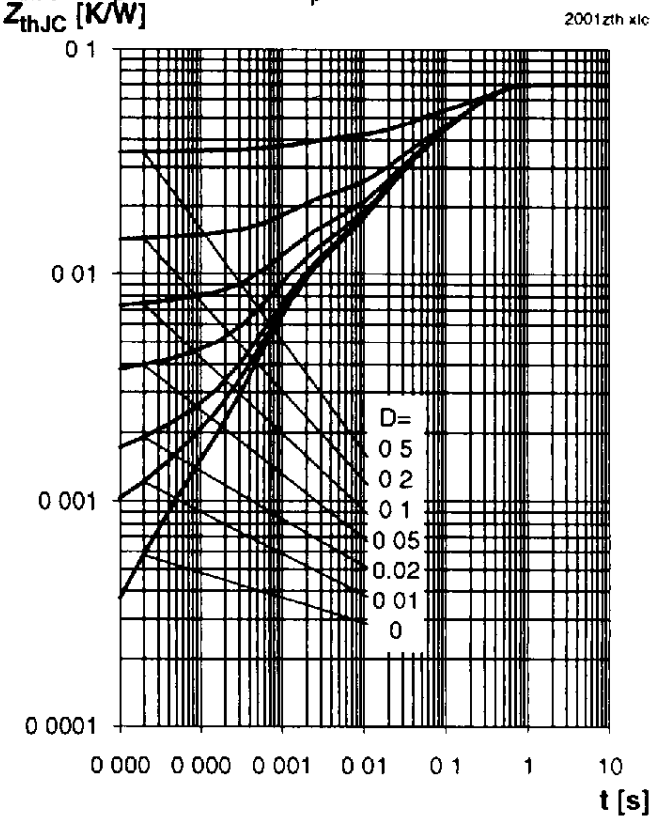
Typ. capacitances

Parameter: V_{GE}= 0, f=1 MHz

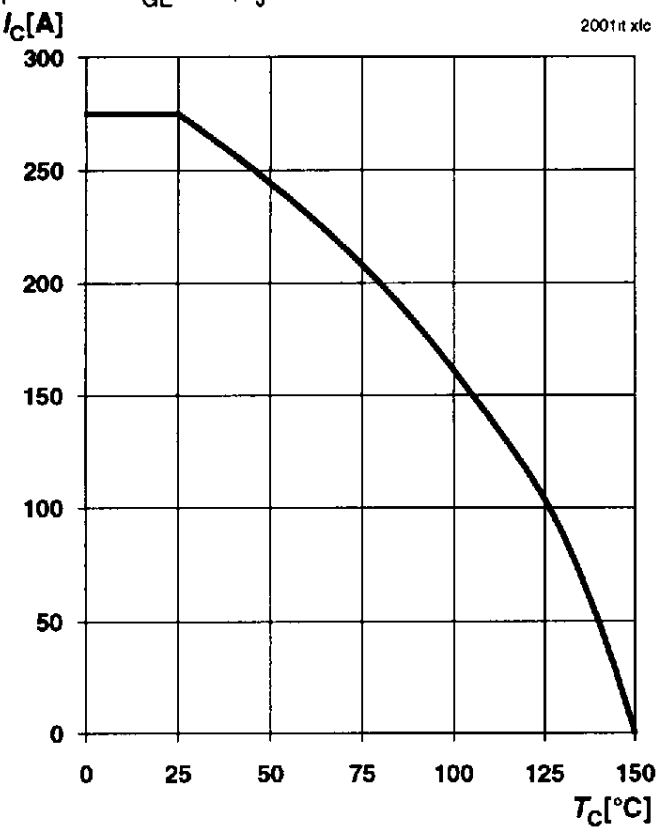


Transient thermal impedance

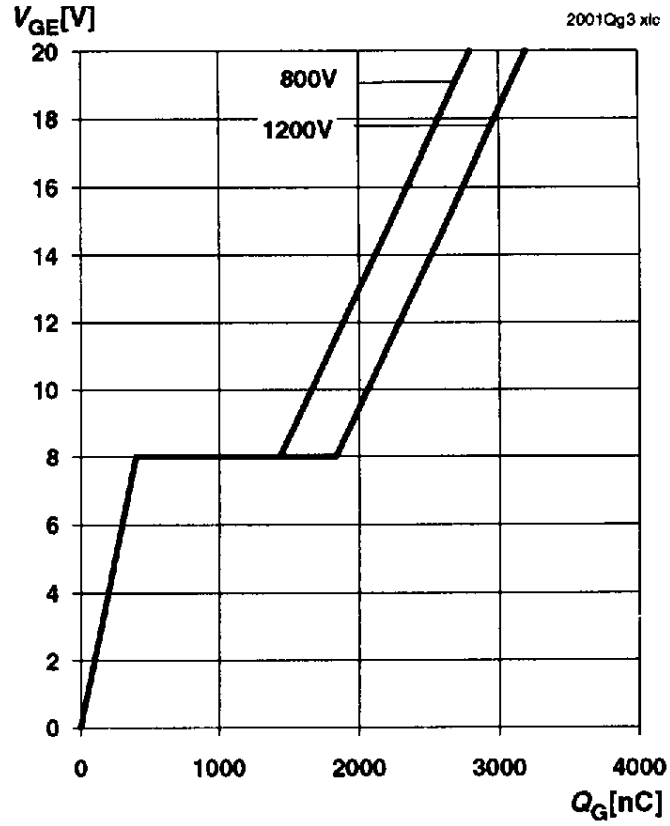
$Z_{thJC} = f(t_p)$, parameter: $D=t_p/T$



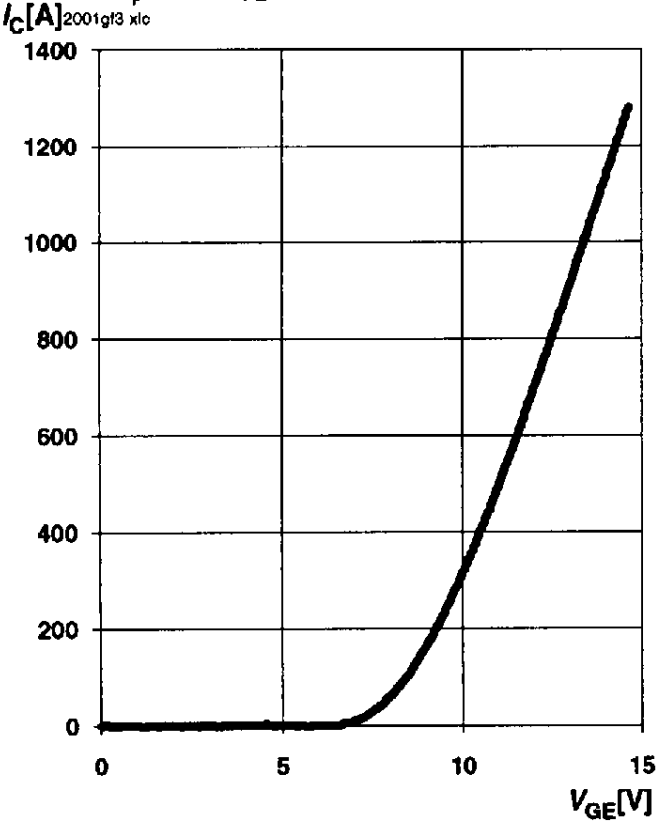
Collector current $I_C=f(T_C)$
parameter: $V_{GE}\geq 15V, T_J=150°$



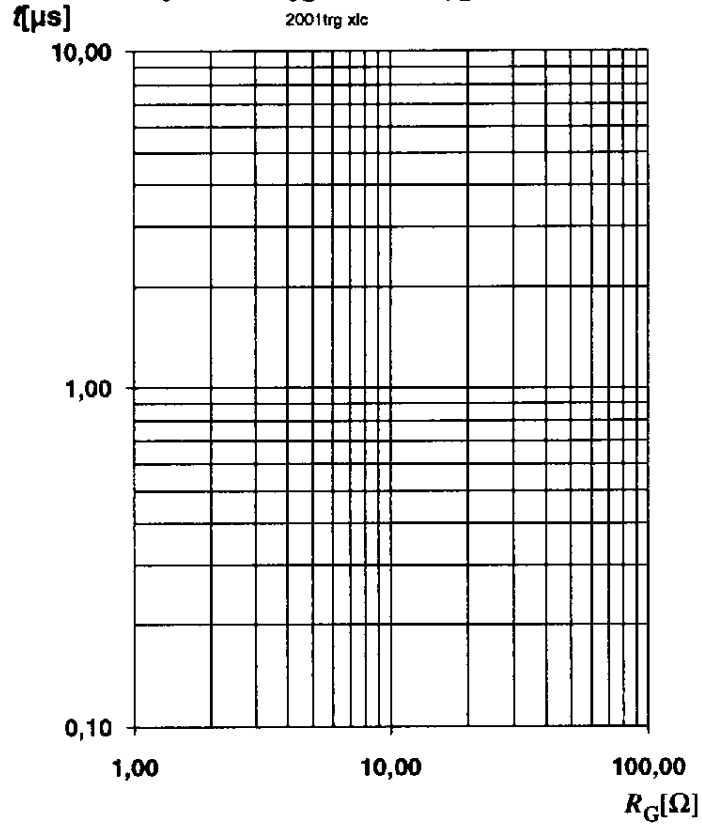
Typ. gate charge , $V_{GE}=f(Q_G)$



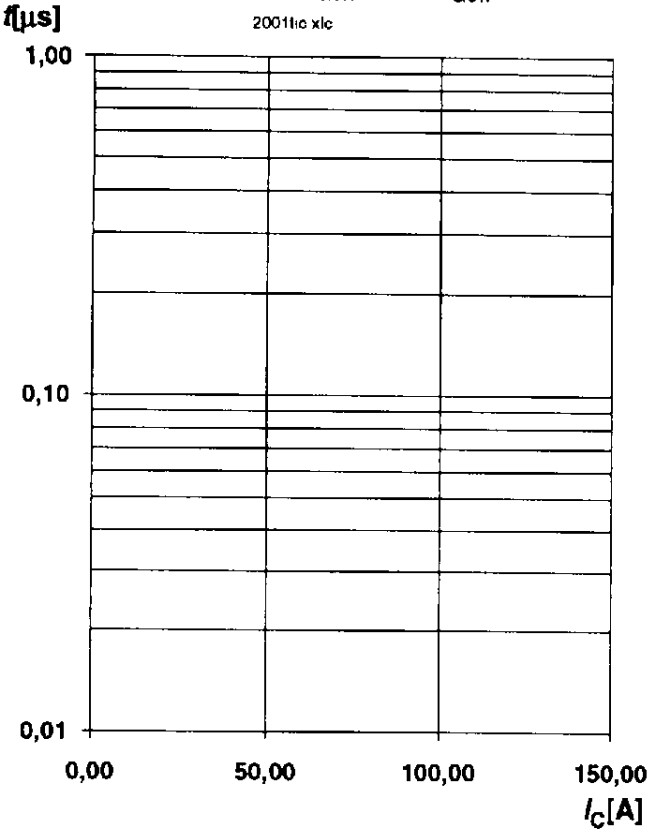
Typ. transfer characteristics $I_C=f(V_{GE})$
parameter: $t_p=80\mu s, V_{CE}=20V$



Typ.switching time $t=f(R_G)$ Inductive load
parameter: $T_J=125°C$ $V_{CE}=1200V$, $V_{GE}=\pm 15V$



Typ.switching time $t=f(I_C)$
Inductive load,parameter: $T_J=125°C$
$V_{CE}=1200V, V_{GE}=\pm15V, R_{Gon}=47\Omega, R_{Goff}=3.3\Omega$



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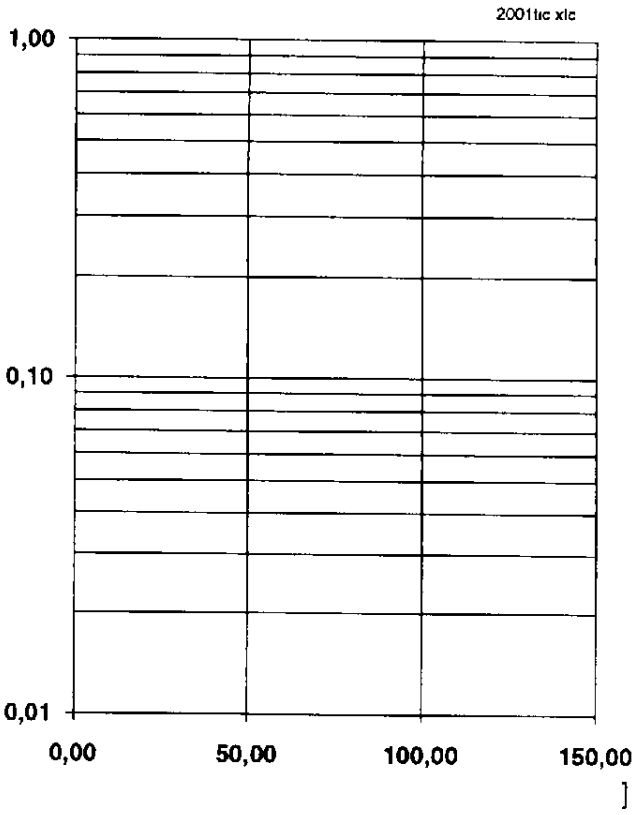
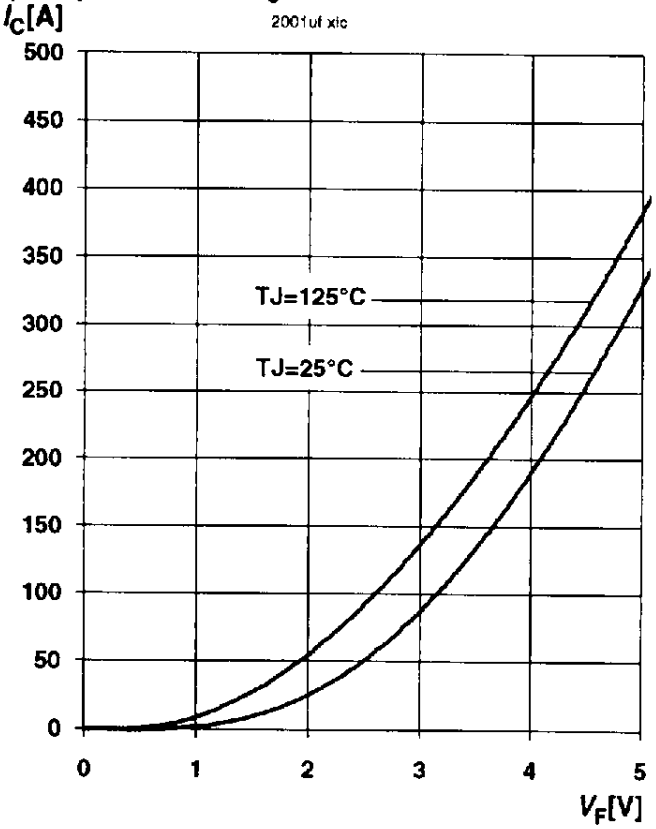
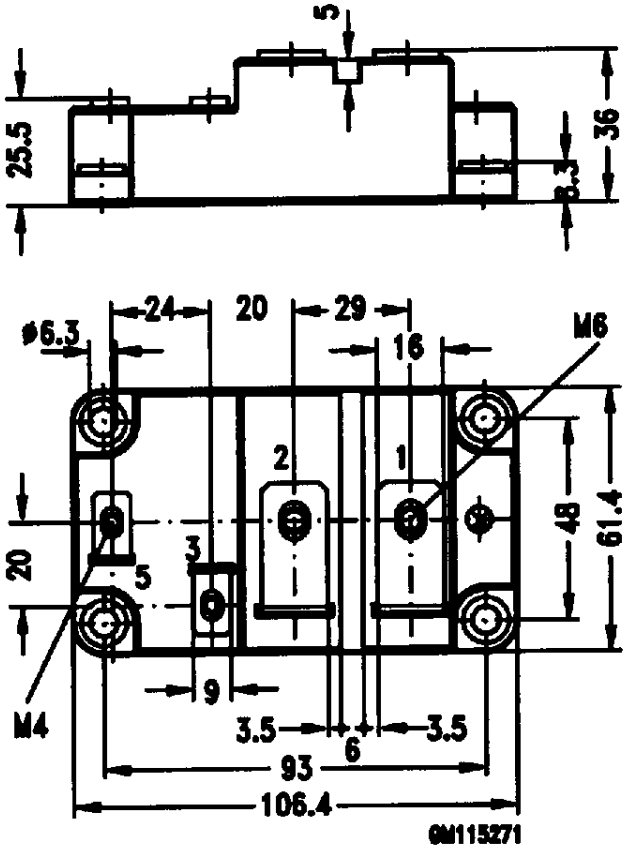


Forward characteristics of fast recovery reverse diode
$I_F=f(V_F)$, **parameter:** T_J



Package Outlines and Configuration



Circuit