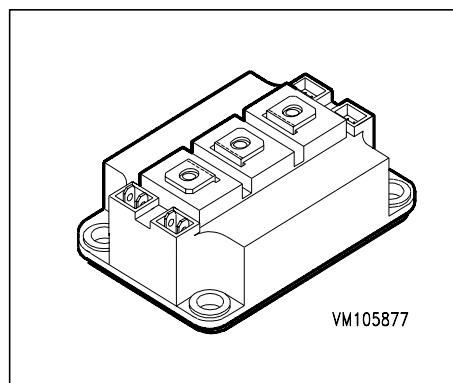


IGBT Power Module

- Half-bridge
- Including fast free-wheeling diodes
- Package with insulated metal base plate



Type	V_{CE}	I_C	Package	Ordering Code
BSM 200 GB 120 DN2	1200V	290A	HALF-BRIDGE 2	C67070-A2300-A70

Maximum Ratings

Parameter	Symbol	Values	Unit
Collector-emitter voltage	V_{CE}	1200	V
Collector-gate voltage	V_{CGR}	1200	
$R_{GE} = 20 \text{ k}\Omega$ Gate-emitter voltage	V_{GE}	± 20	
DC collector current	I_C	290 200	A
$T_C = 25 \text{ }^\circ\text{C}$			
$T_C = 80 \text{ }^\circ\text{C}$			
Pulsed collector current, $t_p = 1 \text{ ms}$	I_{Cpuls}	580 400	W
$T_C = 25 \text{ }^\circ\text{C}$			
$T_C = 80 \text{ }^\circ\text{C}$			
Power dissipation per IGBT	P_{tot}	1400	$^\circ\text{C}$
$T_C = 25 \text{ }^\circ\text{C}$			
Chip temperature	T_j	+ 150	
Storage temperature	T_{stg}	-55 ... + 150	
Thermal resistance, chip case	R_{thJC}	≤ 0.09	K/W
Diode thermal resistance, chip case	R_{thJCD}	≤ 0.18	
Insulation test voltage, $t = 1\text{min.}$	V_{is}	2500	Vac
Creepage distance	-	20	mm
Clearance	-	11	
DIN humidity category, DIN 40 040	-	F	-
IEC climatic category, DIN IEC 68-1	-	55 / 150 / 56	

Electrical Characteristics, at $T_j = 25\text{ °C}$, unless otherwise specified

Parameter	Symbol	Values			Unit
		min.	typ.	max.	

Static Characteristics

Gate threshold voltage $V_{GE} = V_{CE}, I_C = 8\text{ mA}$	$V_{GE(th)}$	4.5	5.5	6.5	V
Collector-emitter saturation voltage $V_{GE} = 15\text{ V}, I_C = 200\text{ A}, T_j = 25\text{ °C}$ $V_{GE} = 15\text{ V}, I_C = 200\text{ A}, T_j = 125\text{ °C}$	$V_{CE(sat)}$	- -	2.5 3.1	3 3.7	
Zero gate voltage collector current $V_{CE} = 1200\text{ V}, V_{GE} = 0\text{ V}, T_j = 25\text{ °C}$ $V_{CE} = 1200\text{ V}, V_{GE} = 0\text{ V}, T_j = 125\text{ °C}$	I_{CES}	- -	3 12	4 -	mA
Gate-emitter leakage current $V_{GE} = 20\text{ V}, V_{CE} = 0\text{ V}$	I_{GES}	-	-	400	

AC Characteristics

Transconductance $V_{CE} = 20\text{ V}, I_C = 200\text{ A}$	g_{fs}	108	-	-	S
Input capacitance $V_{CE} = 25\text{ V}, V_{GE} = 0\text{ V}, f = 1\text{ MHz}$	C_{iss}	-	13	-	
Output capacitance $V_{CE} = 25\text{ V}, V_{GE} = 0\text{ V}, f = 1\text{ MHz}$	C_{oss}	-	2	-	
Reverse transfer capacitance $V_{CE} = 25\text{ V}, V_{GE} = 0\text{ V}, f = 1\text{ MHz}$	C_{rss}	-	1	-	

Electrical Characteristics, at $T_j = 25\text{ °C}$, unless otherwise specified

Parameter	Symbol	Values			Unit
		min.	typ.	max.	

Switching Characteristics, Inductive Load at $T_j = 125\text{ °C}$

Turn-on delay time $V_{CC} = 600\text{ V}$, $V_{GE} = 15\text{ V}$, $I_C = 200\text{ A}$ $R_{Gon} = 4.7\text{ }\Omega$	$t_{d(on)}$	-	110	220	ns
Rise time $V_{CC} = 600\text{ V}$, $V_{GE} = 15\text{ V}$, $I_C = 200\text{ A}$ $R_{Gon} = 4.7\text{ }\Omega$	t_r	-	80	160	
Turn-off delay time $V_{CC} = 600\text{ V}$, $V_{GE} = -15\text{ V}$, $I_C = 200\text{ A}$ $R_{Goff} = 4.7\text{ }\Omega$	$t_{d(off)}$	-	550	800	
Fall time $V_{CC} = 600\text{ V}$, $V_{GE} = -15\text{ V}$, $I_C = 200\text{ A}$ $R_{Goff} = 4.7\text{ }\Omega$	t_f	-	80	120	

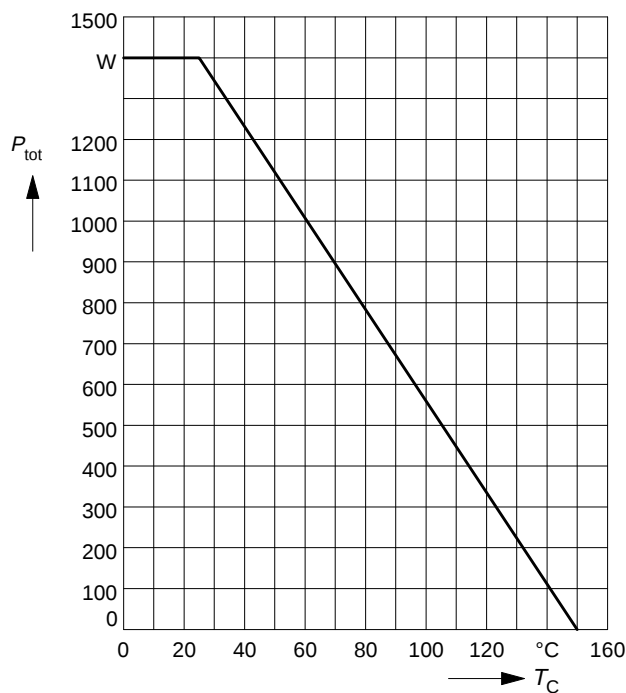
Free-Wheel Diode

Diode forward voltage $I_F = 200\text{ A}$, $V_{GE} = 0\text{ V}$, $T_j = 25\text{ °C}$ $I_F = 200\text{ A}$, $V_{GE} = 0\text{ V}$, $T_j = 125\text{ °C}$	V_F	-	2.3 1.8	2.8 -	V
Reverse recovery time $I_F = 200\text{ A}$, $V_R = -600\text{ V}$, $V_{GE} = 0\text{ V}$ $dI_F/dt = -2000\text{ A}/\mu\text{s}$, $T_j = 125\text{ °C}$	t_{rr}	-	0.5	-	
Reverse recovery charge $I_F = 200\text{ A}$, $V_R = -600\text{ V}$, $V_{GE} = 0\text{ V}$ $dI_F/dt = -2000\text{ A}/\mu\text{s}$ $T_j = 25\text{ °C}$ $T_j = 125\text{ °C}$	Q_{rr}	-	12 36	- -	μC
		-			

Power dissipation

$$P_{\text{tot}} = f(T_C)$$

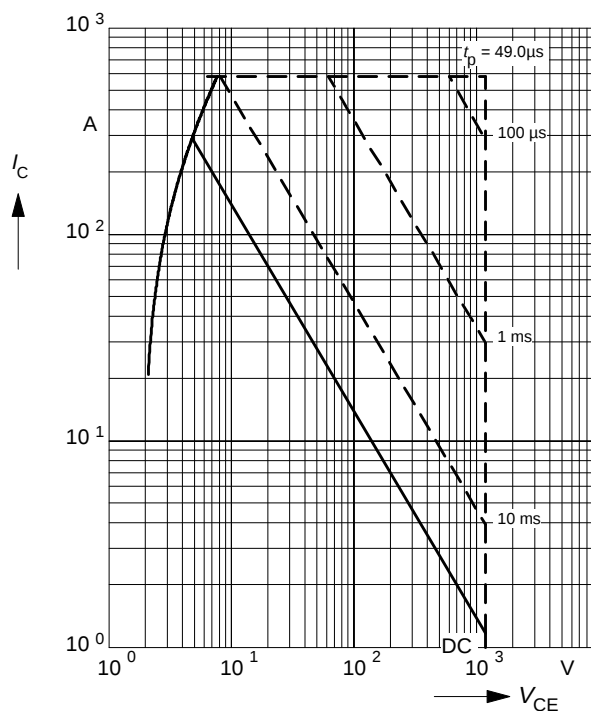
parameter: $T_j \leq 150^\circ\text{C}$



Safe operating area

$$I_C = f(V_{CE})$$

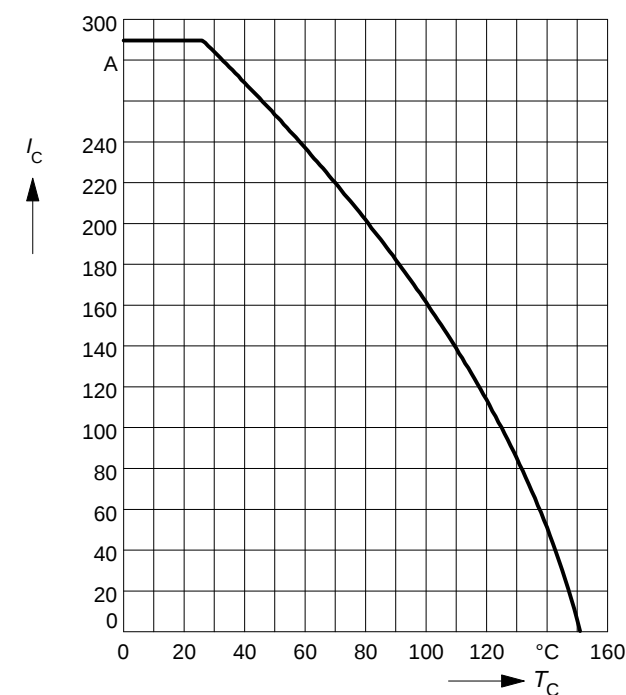
parameter: $D = 0$, $T_C = 25^\circ\text{C}$, $T_j \leq 150^\circ\text{C}$



Collector current

$$I_C = f(T_C)$$

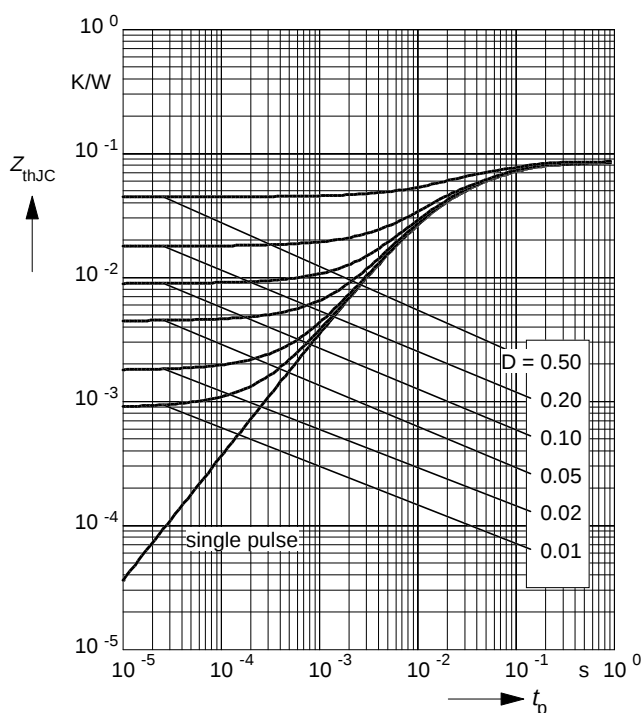
parameter: $V_{GE} \geq 15\text{ V}$, $T_j \leq 150^\circ\text{C}$



Transient thermal impedance IGBT

$$Z_{\text{thJC}} = f(t_p)$$

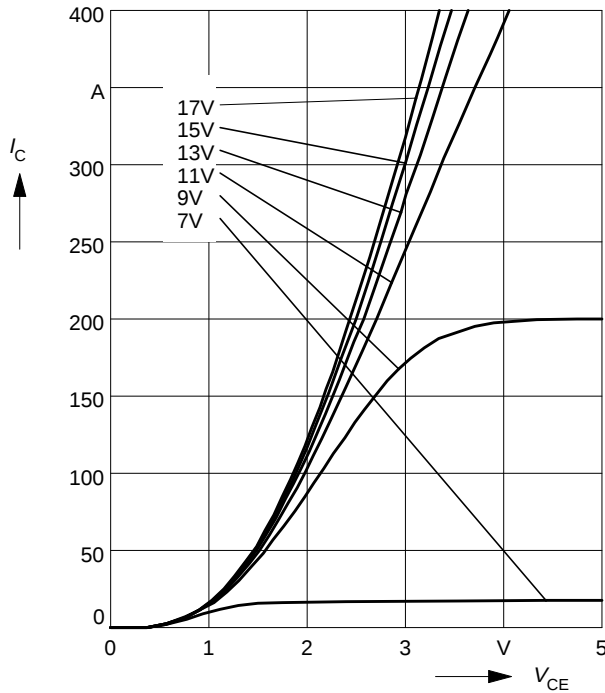
parameter: $D = t_p / T$



Typ. output characteristics

$$I_C = f(V_{CE})$$

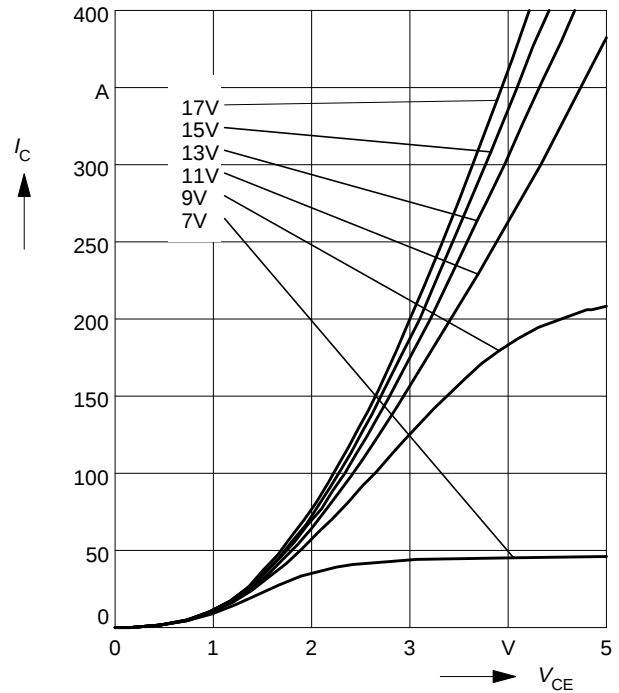
parameter: $t_p = 80 \mu s$, $T_j = 25^\circ C$



Typ. output characteristics

$$I_C = f(V_{CE})$$

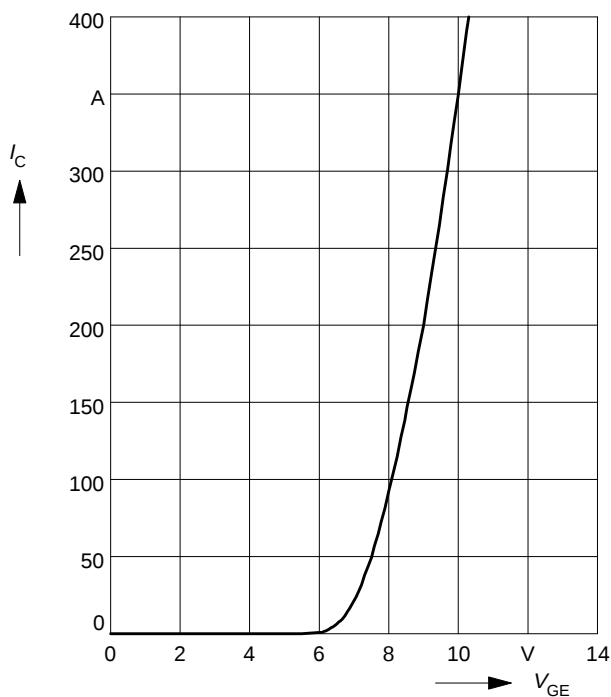
parameter: $t_p = 80 \mu s$, $T_j = 125^\circ C$



Typ. transfer characteristics

$$I_C = f(V_{GE})$$

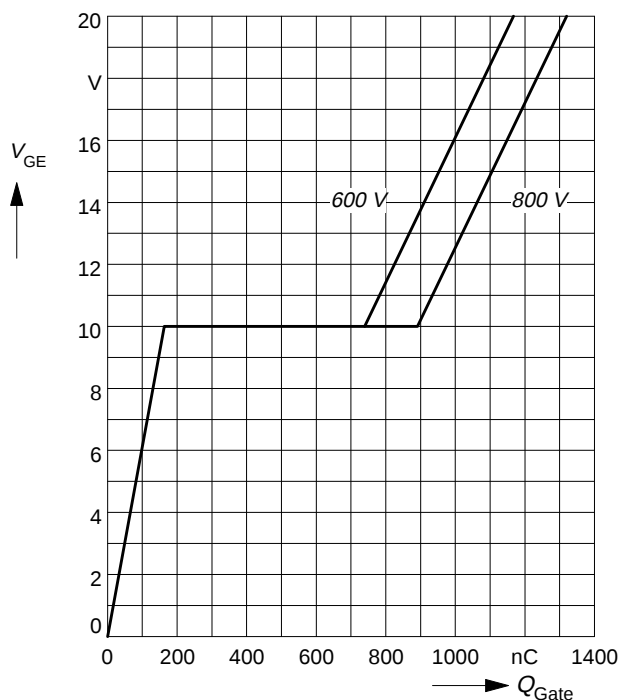
parameter: $t_p = 80 \mu s$, $V_{CE} = 20 V$



Typ. gate charge

$$V_{GE} = f(Q_{Gate})$$

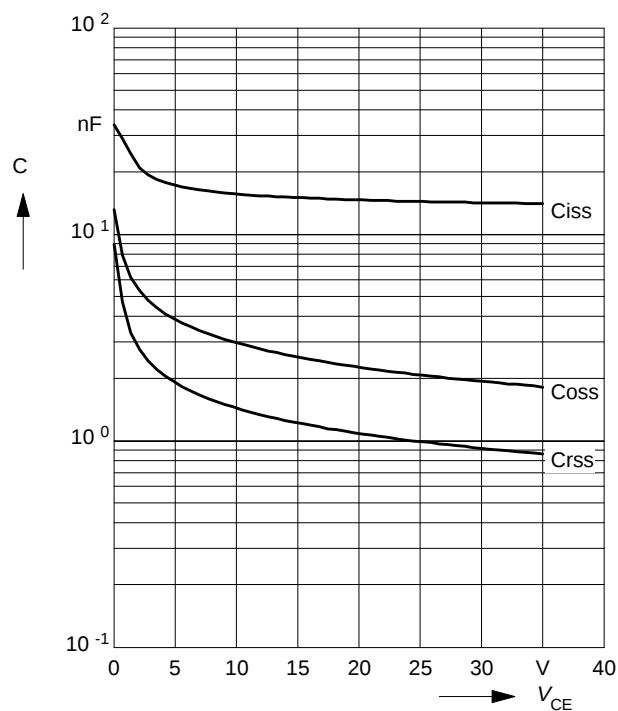
parameter: $I_{C\ puls} = 200\ A$



Typ. capacitances

$$C = f(V_{CE})$$

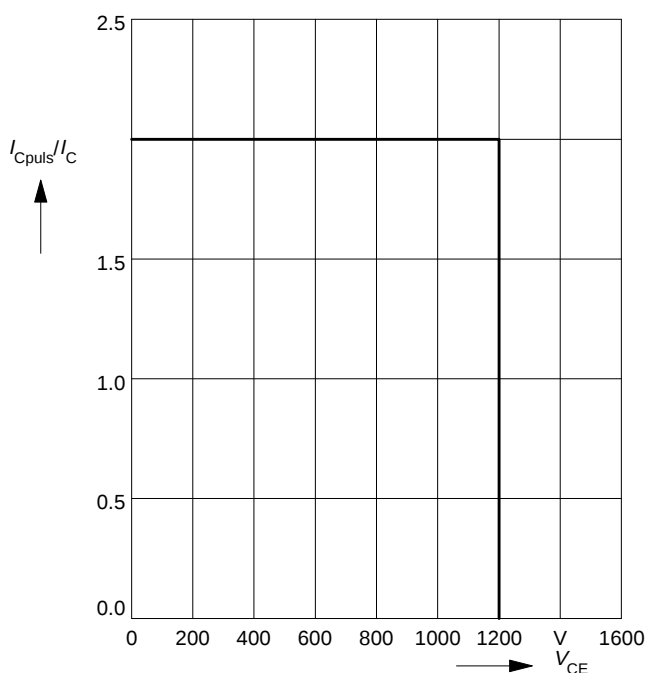
parameter: $V_{GE} = 0\ V$, $f = 1\ MHz$



Reverse biased safe operating area

$$I_{C\ puls} = f(V_{CE}), T_j = 150^\circ C$$

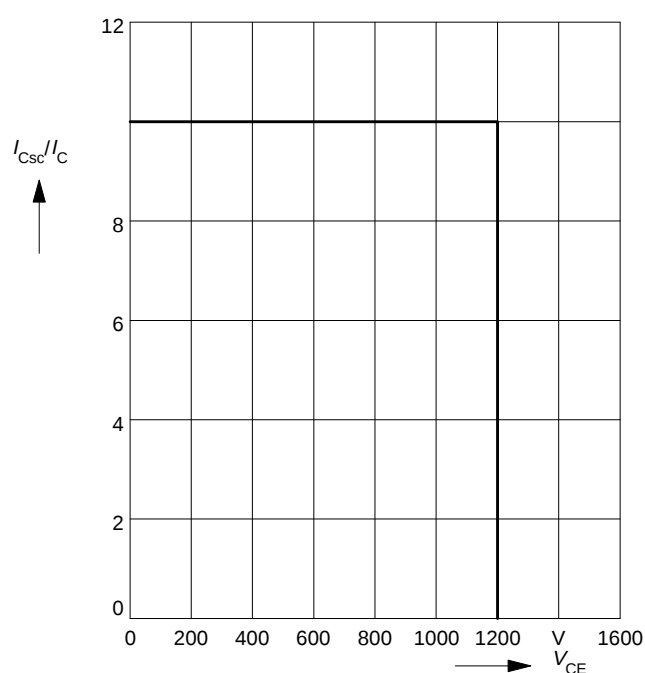
parameter: $V_{GE} = 15\ V$



Short circuit safe operating area

$$I_{C\ sc} = f(V_{CE}), T_j = 150^\circ C$$

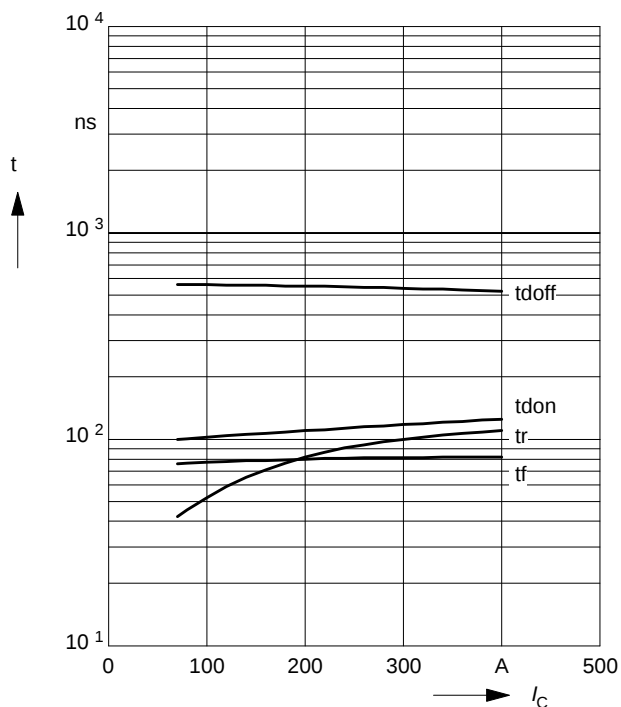
parameter: $V_{GE} = \pm 15\ V$, $t_{SC} \leq 10\ \mu s$, $L < 25\ nH$



Typ. switching time

$t = f(I_C)$, inductive load, $T_j = 125^\circ\text{C}$

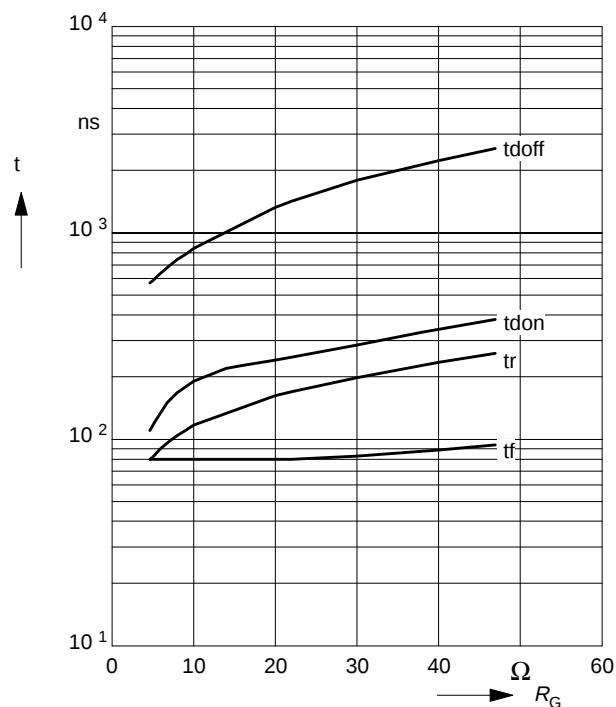
par.: $V_{CE} = 600\text{ V}$, $V_{GE} = \pm 15\text{ V}$, $R_G = 4.7\ \Omega$



Typ. switching time

$t = f(R_G)$, inductive load, $T_j = 125^\circ\text{C}$

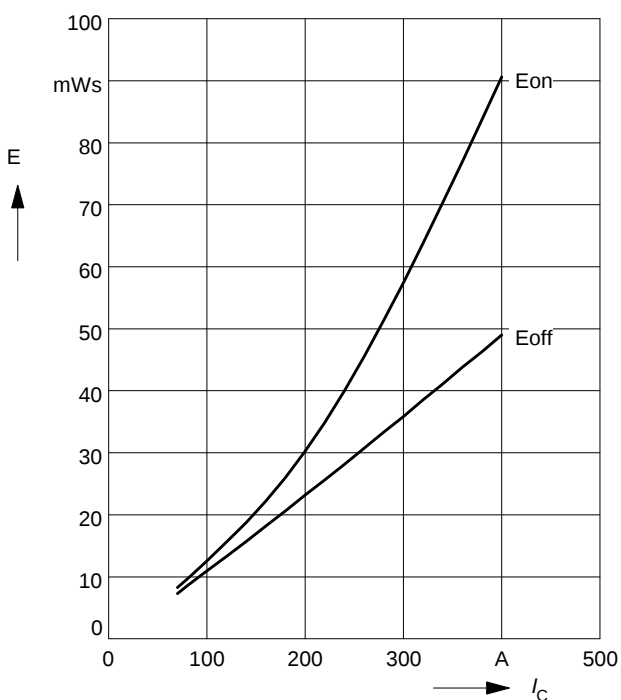
par.: $V_{CE} = 600\text{ V}$, $V_{GE} = \pm 15\text{ V}$, $I_C = 200\text{ A}$



Typ. switching losses

$E = f(I_C)$, inductive load, $T_j = 125^\circ\text{C}$

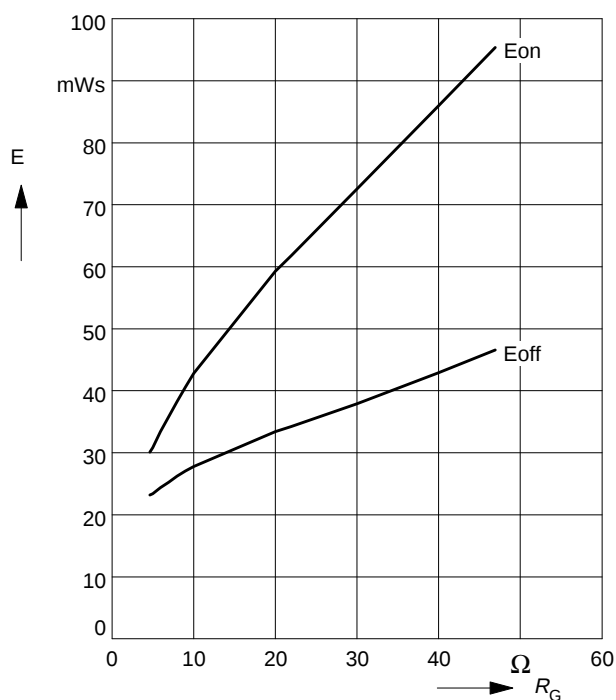
par.: $V_{CE} = 600\text{ V}$, $V_{GE} = \pm 15\text{ V}$, $R_G = 4.7\ \Omega$



Typ. switching losses

$E = f(R_G)$, inductive load, $T_j = 125^\circ\text{C}$

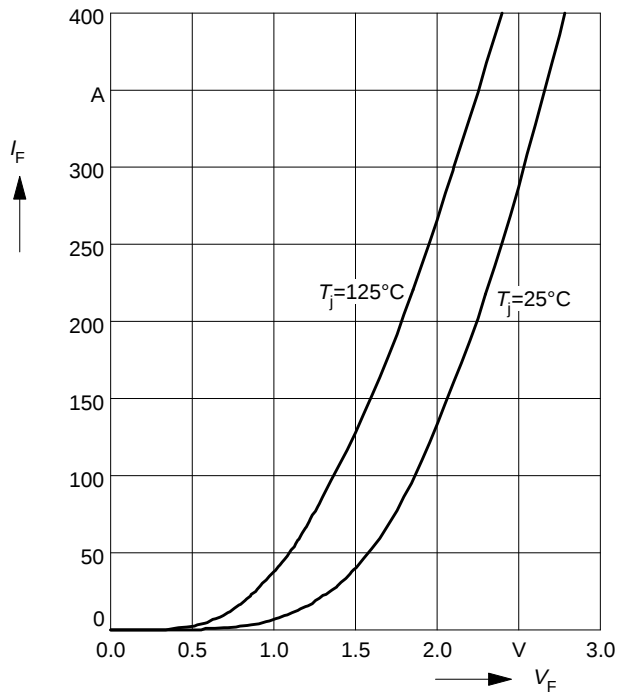
par.: $V_{CE} = 600\text{ V}$, $V_{GE} = \pm 15\text{ V}$, $I_C = 200\text{ A}$



Forward characteristics of fast recovery reverse diode

$$I_F = f(V_F)$$

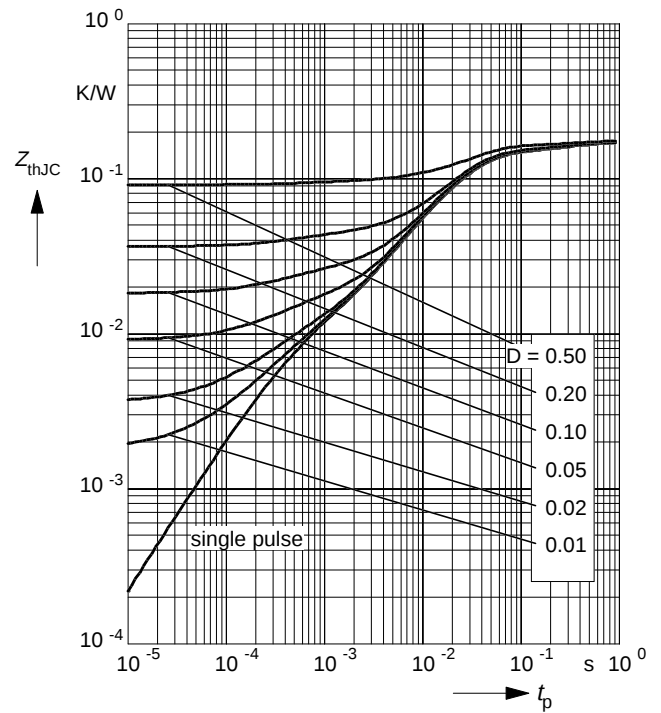
parameter: T_j



Transient thermal impedance Diode

$$Z_{thJC} = f(t_p)$$

parameter: $D = t_p / T$



SIS00026

Technical drawing of the GM105877 component, showing front and side views with dimensions.

Front View Dimensions:

- Overall width: 106.4
- Overall height: 61.4
- Top flange width: 30
- Top flange thickness: 14
- Bottom flange width: 28
- Bottom flange thickness: 20
- Central section width: 93
- Section 1 width: 22.5
- Section 2 width: 6
- Section 3 width: 22
- Section 4 width: 6
- Section 5 width: 22.5
- Section 6 width: 16
- Section 7 width: 6
- Section 8 width: 7
- Section 9 width: 15
- Section 10 width: 27
- Section 11 width: 48
- Section 12 width: 61.4
- Section 13 width: 15
- Section 14 width: 27
- Section 15 width: 48
- Section 16 width: 61.4
- Section 17 width: 15
- Section 18 width: 27
- Section 19 width: 48
- Section 20 width: 61.4
- Section 21 width: 15
- Section 22 width: 27
- Section 23 width: 48
- Section 24 width: 61.4
- Section 25 width: 15
- Section 26 width: 27
- Section 27 width: 48
- Section 28 width: 61.4
- Section 29 width: 15
- Section 30 width: 27
- Section 31 width: 48
- Section 32 width: 61.4
- Section 33 width: 15
- Section 34 width: 27
- Section 35 width: 48
- Section 36 width: 61.4
- Section 37 width: 15
- Section 38 width: 27
- Section 39 width: 48
- Section 40 width: 61.4
- Section 41 width: 15
- Section 42 width: 27
- Section 43 width: 48
- Section 44 width: 61.4
- Section 45 width: 15
- Section 46 width: 27
- Section 47 width: 48
- Section 48 width: 61.4
- Section 49 width: 15
- Section 50 width: 27
- Section 51 width: 48
- Section 52 width: 61.4
- Section 53 width: 15
- Section 54 width: 27
- Section 55 width: 48
- Section 56 width: 61.4
- Section 57 width: 15
- Section 58 width: 27
- Section 59 width: 48
- Section 60 width: 61.4
- Section 61 width: 15
- Section 62 width: 27
- Section 63 width: 48
- Section 64 width: 61.4
- Section 65 width: 15
- Section 66 width: 27
- Section 67 width: 48
- Section 68 width: 61.4
- Section 69 width: 15
- Section 70 width: 27
- Section 71 width: 48
- Section 72 width: 61.4
- Section 73 width: 15
- Section 74 width: 27
- Section 75 width: 48
- Section 76 width: 61.4
- Section 77 width: 15
- Section 78 width: 27
- Section 79 width: 48
- Section 80 width: 61.4
- Section 81 width: 15
- Section 82 width: 27
- Section 83 width: 48
- Section 84 width: 61.4
- Section 85 width: 15
- Section 86 width: 27
- Section 87 width: 48
- Section 88 width: 61.4
- Section 89 width: 15
- Section 90 width: 27
- Section 91 width: 48
- Section 92 width: 61.4
- Section 93 width: 15
- Section 94 width: 27
- Section 95 width: 48
- Section 96 width: 61.4
- Section 97 width: 15
- Section 98 width: 27
- Section 99 width: 48
- Section 100 width: 61.4

Side View Dimensions:

- Overall height: 30.5
- Top flange height: 26
- Top flange thickness: 5
- Bottom flange height: 23
- Bottom flange thickness: 30
- Central section height: 10
- Section 1 height: 7
- Section 2 height: 10
- Section 3 height: 23
- Section 4 height: 30
- Section 5 height: 10
- Section 6 height: 7
- Section 7 height: 10
- Section 8 height: 23
- Section 9 height: 30
- Section 10 height: 10
- Section 11 height: 7
- Section 12 height: 10
- Section 13 height: 23
- Section 14 height: 30
- Section 15 height: 10
- Section 16 height: 7
- Section 17 height: 10
- Section 18 height: 23
- Section 19 height: 30
- Section 20 height: 10
- Section 21 height: 7
- Section 22 height: 10
- Section 23 height: 23
- Section 24 height: 30
- Section 25 height: 10
- Section 26 height: 7
- Section 27 height: 10
- Section 28 height: 23
- Section 29 height: 30
- Section 30 height: 10
- Section 31 height: 7
- Section 32 height: 10
- Section 33 height: 23
- Section 34 height: 30
- Section 35 height: 10
- Section 36 height: 7
- Section 37 height: 10
- Section 38 height: 23
- Section 39 height: 30
- Section 40 height: 10
- Section 41 height: 7
- Section 42 height: 10
- Section 43 height: 23
- Section 44 height: 30
- Section 45 height: 10
- Section 46 height: 7
- Section 47 height: 10
- Section 48 height: 23
- Section 49 height: 30
- Section 50 height: 10
- Section 51 height: 7
- Section 52 height: 10
- Section 53 height: 23
- Section 54 height: 30
- Section 55 height: 10
- Section 56 height: 7
- Section 57 height: 10
- Section 58 height: 23
- Section 59 height: 30
- Section 60 height: 10
- Section 61 height: 7
- Section 62 height: 10
- Section 63 height: 23
- Section 64 height: 30
- Section 65 height: 10
- Section 66 height: 7
- Section 67 height: 10
- Section 68 height: 23
- Section 69 height: 30
- Section 70 height: 10
- Section 71 height: 7
- Section 72 height: 10
- Section 73 height: 23
- Section 74 height: 30
- Section 75 height: 10
- Section 76 height: 7
- Section 77 height: 10
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- Section 79 height: 30
- Section 80 height: 10
- Section 81 height: 7
- Section 82 height: 10
- Section 83 height: 23
- Section 84 height: 30
- Section 85 height: 10
- Section 86 height: 7
- Section 87 height: 10
- Section 88 height: 23
- Section 89 height: 30
- Section 90 height: 10
- Section 91 height: 7
- Section 92 height: 10
- Section 93 height: 23
- Section 94 height: 30
- Section 95 height: 10
- Section 96 height: 7
- Section 97 height: 10
- Section 98 height: 23
- Section 99 height: 30
- Section 100 height: 10

Other Dimensions:

- M6
- 2.8 x 0.5
- Ø6.4