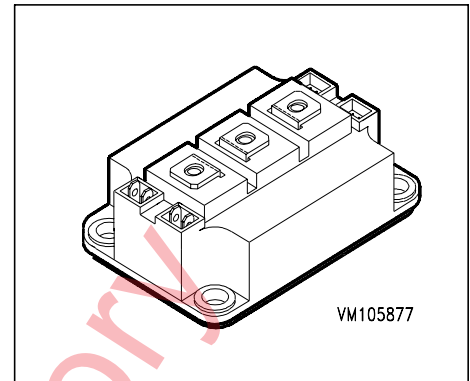


### IGBT Power Module

- Single switch with chopper diode
- Including fast free-wheeling diodes
- Package with insulated metal base plate



Type	$V_{CE}$	$I_C$	Package	Ordering Code
BSM150GAL120DN2E3166	1200V	210A	HALF BRIDGE GAL 2	C67076-A2112-A70

### Maximum Ratings

Parameter	Symbol	Values	Unit
Collector-emitter voltage	$V_{CE}$	1200	V
Collector-gate voltage $R_{GE} = 20 \text{ k}\Omega$	$V_{CGR}$	1200	
Gate-emitter voltage	$V_{GE}$	$\pm 20$	
DC collector current $T_C = 25 \text{ }^\circ\text{C}$ $T_C = 80 \text{ }^\circ\text{C}$	$I_C$	210 150	A
Pulsed collector current, $t_p = 1 \text{ ms}$ $T_C = 25 \text{ }^\circ\text{C}$ $T_C = 80 \text{ }^\circ\text{C}$	$I_{Cpuls}$	420 300	
Power dissipation per IGBT $T_C = 25 \text{ }^\circ\text{C}$	$P_{tot}$	1250	W
Chip temperature	$T_j$	+ 150	$^\circ\text{C}$
Storage temperature	$T_{stg}$	-55 ... + 150	
Thermal resistance, chip case	$R_{thJC}$	$\leq 0.1$	K/W
Diode thermal resistance, chip case	$R_{thJCD}$	$\leq 0.25$	
Diode thermal resistance, chip-case,chopper	$R_{thJCDC}$	$\leq 0.125$	
Insulation test voltage, $t = 1 \text{ min.}$	$V_{is}$	4000	Vac
Creepage distance	-	20	mm
Clearance	-	11	
DIN humidity category, DIN 40 040	-	F	sec
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 $V_{GE} = V_{CE}, I_C = 6\text{ mA}$	$V_{GE(th)}$	4.5	5.5	6.5	V
Collector-emitter saturation voltage $V_{GE} = 15\text{ V}, I_C = 150\text{ A}, T_j = 25\text{ °C}$ $V_{GE} = 15\text{ V}, I_C = 150\text{ A}, T_j = 125\text{ °C}$	$V_{CE(sat)}$	- -	2.5 3.1	3 3.7	
Zero gate voltage collector current $V_{CE} = 1200\text{ V}, V_{GE} = 0\text{ V}, T_j = 25\text{ °C}$ $V_{CE} = 1200\text{ V}, V_{GE} = 0\text{ V}, T_j = 125\text{ °C}$	$I_{CES}$	- -	2 8	2.8 -	mA
Gate-emitter leakage current $V_{GE} = 20\text{ V}, V_{CE} = 0\text{ V}$	$I_{GES}$	-	-	320	nA

### AC Characteristics

Transconductance $V_{CE} = 20\text{ V}, I_C = 150\text{ A}$	$g_{fs}$	62	-	-	S
Input capacitance $V_{CE} = 25\text{ V}, V_{GE} = 0\text{ V}, f = 1\text{ MHz}$	$C_{iss}$	-	11	-	nF
Output capacitance $V_{CE} = 25\text{ V}, V_{GE} = 0\text{ V}, f = 1\text{ MHz}$	$C_{oss}$	-	1.6	-	
Reverse transfer capacitance $V_{CE} = 25\text{ V}, V_{GE} = 0\text{ V}, f = 1\text{ MHz}$	$C_{rss}$	-	0.6	-	

### 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 $V_{CC} = 600\text{ V}$ , $V_{GE} = 15\text{ V}$ , $I_C = 150\text{ A}$ $R_{Gon} = 5.6\ \Omega$	$t_{d(on)}$	-	200	400	ns
Rise time $V_{CC} = 600\text{ V}$ , $V_{GE} = 15\text{ V}$ , $I_C = 150\text{ A}$ $R_{Gon} = 5.6\ \Omega$	$t_r$	-	100	200	
Turn-off delay time $V_{CC} = 600\text{ V}$ , $V_{GE} = -15\text{ V}$ , $I_C = 150\text{ A}$ $R_{Goff} = 5.6\ \Omega$	$t_{d(off)}$	-	600	800	
Fall time $V_{CC} = 600\text{ V}$ , $V_{GE} = -15\text{ V}$ , $I_C = 150\text{ A}$ $R_{Goff} = 5.6\ \Omega$	$t_f$	-	70	100	

### Free-Wheel Diode

Diode forward voltage $I_F = 150\text{ A}$ , $V_{GE} = 0\text{ V}$ , $T_j = 25\text{ °C}$ $I_F = 150\text{ A}$ , $V_{GE} = 0\text{ V}$ , $T_j = 125\text{ °C}$	$V_F$	-	2.3	2.8	V
Reverse recovery time $I_F = 150\text{ A}$ , $V_R = -600\text{ V}$ , $V_{GE} = 0\text{ V}$ $di_F/dt = -1500\text{ A}/\mu\text{s}$ , $T_j = 125\text{ °C}$	$t_{rr}$	-	0.4	-	
Reverse recovery charge $I_F = 150\text{ A}$ , $V_R = -600\text{ V}$ , $V_{GE} = 0\text{ V}$ $di_F/dt = -1500\text{ A}/\mu\text{s}$ $T_j = 25\text{ °C}$ $T_j = 125\text{ °C}$	$Q_{rr}$	-	5	-	$\mu\text{C}$
		-	18	-	

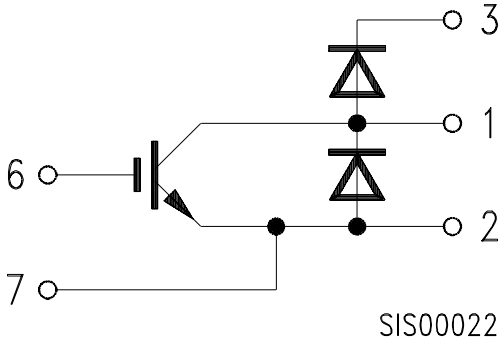
**Electrical Characteristics, at  $T_j = 25\text{ °C}$ , unless otherwise specified**

Parameter	Symbol	Values			Unit
		min.	typ.	max.	

**Chopper Diode**

Chopper diode forward voltage $I_{FC} = 300\text{ A}$ , $V_{GE} = 0\text{ V}$ , $T_j = 25\text{ °C}$ $I_{FC} = 300\text{ A}$ , $V_{GE} = 0\text{ V}$ , $T_j = 125\text{ °C}$	$V_{FC}$	- -	2.3 1.8	2.8 -	V
Reverse recovery time, chopper $I_{FC} = 300\text{ A}$ , $V_R = -600\text{ V}$ , $V_{GE} = 0\text{ V}$ $di_F/dt = -2500\text{ A}/\mu\text{s}$ , $T_j = 125\text{ °C}$	$t_{rrC}$	-	0.55	-	$\mu\text{s}$
Reverse recovery charge, chopper $I_{FC} = 300\text{ A}$ , $V_R = -600\text{ V}$ , $V_{GE} = 0\text{ V}$ $di_F/dt = -2500\text{ A}/\mu\text{s}$ $T_j = 25\text{ °C}$ $T_j = 125\text{ °C}$	$Q_{rrC}$	- -	14 40	- -	$\mu\text{C}$

Circuit Diagram



Package Outlines

Dimensions in mm  
Weight: 420g

