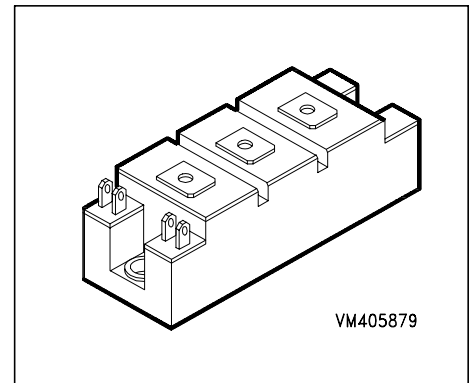


### IGBT Power Module

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



Type	$V_{CE}$	$I_C$	Package	Ordering Code
BSM 50 GB 120 DN2	1200V	78A	HALF-BRIDGE 1	C67076-A2105-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	$V_{GE}$	$\pm 20$	
DC collector current	$I_C$	78	A
$T_C = 25 \text{ }^\circ\text{C}$			
$T_C = 80 \text{ }^\circ\text{C}$		50	
Pulsed collector current, $t_p = 1 \text{ ms}$	$I_{Cpuls}$	156	
$T_C = 25 \text{ }^\circ\text{C}$			
$T_C = 80 \text{ }^\circ\text{C}$		100	
Power dissipation per IGBT	$P_{tot}$	400	W
$T_C = 25 \text{ }^\circ\text{C}$			
Chip temperature	$T_j$	+ 150	$^\circ\text{C}$
Storage temperature	$T_{stg}$	-55 ... + 150	
Thermal resistance, chip case	$R_{thJC}$	$\leq 0.3$	K/W
Diode thermal resistance, chip case	$R_{thJCD}$	$\leq 0.6$	
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 $V_{GE} = V_{CE}, I_C = 2\text{ mA}$	$V_{GE(th)}$	4.5	5.5	6.5	V
Collector-emitter saturation voltage $V_{GE} = 15\text{ V}, I_C = 50\text{ A}, T_j = 25\text{ °C}$ $V_{GE} = 15\text{ V}, I_C = 50\text{ A}, T_j = 125\text{ °C}$	$V_{CE(sat)}$	- -	2.5 3.1	3 3.7	
Zero gate voltage collector current $V_{CE} = 1200\text{ V}, V_{GE} = 0\text{ V}, T_j = 25\text{ °C}$ $V_{CE} = 1200\text{ V}, V_{GE} = 0\text{ V}, T_j = 125\text{ °C}$	$I_{CES}$	- -	0.8 3.5	1 -	mA
Gate-emitter leakage current $V_{GE} = 20\text{ V}, V_{CE} = 0\text{ V}$	$I_{GES}$	-	-	200	nA

**AC Characteristics**

Transconductance $V_{CE} = 20\text{ V}, I_C = 50\text{ A}$	$g_{fs}$	23	-	-	S
Input capacitance $V_{CE} = 25\text{ V}, V_{GE} = 0\text{ V}, f = 1\text{ MHz}$	$C_{iss}$	-	3.3	-	nF
Output capacitance $V_{CE} = 25\text{ V}, V_{GE} = 0\text{ V}, f = 1\text{ MHz}$	$C_{oss}$	-	0.5	-	
Reverse transfer capacitance $V_{CE} = 25\text{ V}, V_{GE} = 0\text{ V}, f = 1\text{ MHz}$	$C_{rss}$	-	0.25	-	

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

Parameter	Symbol	Values			Unit
		min.	typ.	max.	

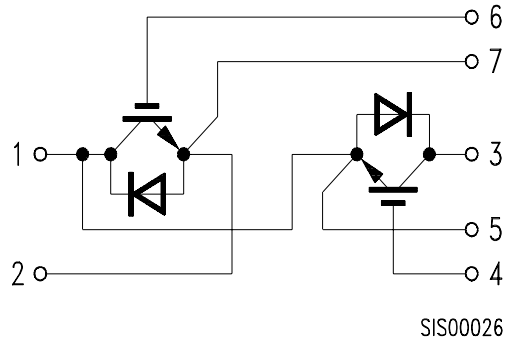
### Switching Characteristics, Inductive Load at $T_j = 125\text{ °C}$

Turn-on delay time $V_{CC} = 600\text{ V}$ , $V_{GE} = 15\text{ V}$ , $I_C = 50\text{ A}$ $R_{Gon} = 22\ \Omega$	$t_{d(on)}$	-	44	100	ns
Rise time $V_{CC} = 600\text{ V}$ , $V_{GE} = 15\text{ V}$ , $I_C = 50\text{ A}$ $R_{Gon} = 22\ \Omega$	$t_r$	-	56	100	
Turn-off delay time $V_{CC} = 600\text{ V}$ , $V_{GE} = -15\text{ V}$ , $I_C = 50\text{ A}$ $R_{Goff} = 22\ \Omega$	$t_{d(off)}$	-	380	500	
Fall time $V_{CC} = 600\text{ V}$ , $V_{GE} = -15\text{ V}$ , $I_C = 50\text{ A}$ $R_{Goff} = 22\ \Omega$	$t_f$	-	70	100	

### Free-Wheel Diode

Diode forward voltage $I_F = 50\text{ A}$ , $V_{GE} = 0\text{ V}$ , $T_j = 25\text{ °C}$ $I_F = 50\text{ A}$ , $V_{GE} = 0\text{ V}$ , $T_j = 125\text{ °C}$	$V_F$	-	2.3 1.8	2.8 -	V
Reverse recovery time $I_F = 50\text{ A}$ , $V_R = -600\text{ V}$ , $V_{GE} = 0\text{ V}$ $di_F/dt = -800\text{ A}/\mu\text{s}$ , $T_j = 125\text{ °C}$	$t_{rr}$	-	0.2	-	
Reverse recovery charge $I_F = 50\text{ A}$ , $V_{GE} = 0\text{ V}$ $V_R = -600\text{ V}$ , $di_F/dt = -800\text{ A}/\mu\text{s}$ , $T_j = 25\text{ °C}$ $V_R = -600\text{ V}$ , $di_F/dt = -800\text{ A}/\mu\text{s}$ , $T_j = 125\text{ °C}$	$Q_{rr}$	-	2.8 8	- -	$\mu\text{C}$

### Circuit Diagram



### Package Outlines

Dimensions in mm

Weight: 250 g

