

MG001AL030060A

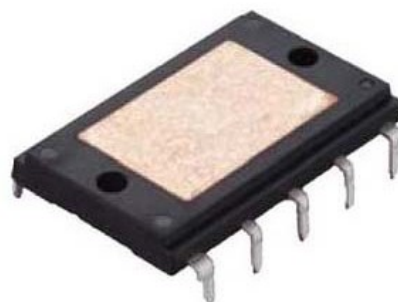
Converter - Brake Module

Feature

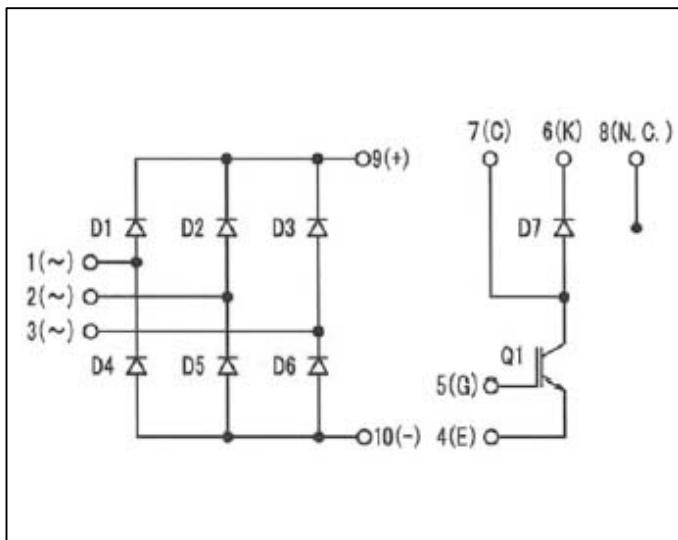
- Small DIP
- Isolated package
- High Voltage
- UL E142422
- Halogen free
- Pb free terminal
- RoHS:Yes

Outline

House Name: MG001



Equivalent circuit



●絶対最大定格 Absolute maximum ratings (指定のない場合は、 $T_c = 25^\circ\text{C}$ / Unless otherwise specified $T_c = 25^\circ\text{C}$.)

コンバータ部 / Converter

ダイオード / Diode

項目 Item	記号 Symbol	条件 Conditions	規格値 Ratings	単位 Unit
接合部温度 Junction temperature	T_j		150	$^\circ\text{C}$
ピーク繰返し逆電圧 Repetitive peak reverse voltage	V_{RRM}		600	V
ピーク非繰返し逆電圧 Non-repetitive peak reverse voltage	V_{RSM}		800	V
平均順電流 Average forward current	$I_{F(AV)}$	50Hz, 正弦波, 抵抗負荷, $T_c = 136^\circ\text{C}$ 50Hz, Sine wave, Resistance load, $T_c = 136^\circ\text{C}$	30	A
サージ順電流 Surge forward current	I_{FSM}	50Hz, 正弦波, 非繰返し, 1サイクル, せん頭値, 1素子当り, $T_j = 25^\circ\text{C}$ 50Hz, Sine wave, Not-repetitive, 1cycle, Peak value, Per diode, $T_j = 25^\circ\text{C}$	300	A
	I_{FSM1}	tp=1ms, 正弦波, 非繰返し, せん頭値, 1素子当り, $T_j = 25^\circ\text{C}$ tp=1ms, Sine wave, Not-repetitive, Peak value, Per diode, $T_j = 25^\circ\text{C}$	700	A
電流二乗時間積 Current squared time	I^2_t	$1\text{ms} \leq t < 10\text{ms}$, 1素子当り, $T_j = 25^\circ\text{C}$ $1\text{ms} \leq t < 10\text{ms}$, Per diode, $T_j = 25^\circ\text{C}$	300	A^2s

最大瞬間接合部温度は 150°C (at $T_c \leq 136^\circ\text{C}$)ですが、安全動作させるための平均動作接合部温度は $T_j \leq 125^\circ\text{C}$ (at $T_c \leq 111^\circ\text{C}$)でご使用ください。

The maximum rated temperature of the is 150°C (at $T_c \leq 136^\circ\text{C}$)

, but in order to operate safely, please use the average operating temperature $T_j \leq 125^\circ\text{C}$ (at $T_c \leq 111^\circ\text{C}$).

ブレーキ部 / Brake

IGBT

項目 Item	記号 Symbol	条件 Conditions	規格値 Ratings	単位 Unit
チャネル温度 Channel temperature	T_{ch}		150	$^\circ\text{C}$
コレクタ-エミッタ間電圧 Collector-emitter voltage	V_{CES}		600	V
ゲート-エミッタ間電圧 Gate-emitter voltage	V_{GES}		± 20	V
コレクタ電流 (直流) Continuous collector current (DC)	I_C		30	A
コレクタ電流 (ピーク) Continuous collector current (Peak)	I_{CP}	パルス幅 10 μs , Duty = 1/100 Pulse width 10 μs , Duty = 1/100	60	A
全損失 Total power dissipation	P_T		125	W

ブレーキ部 / Brake

ダイオード / Diode

項目 Item	記号 Symbol	条件 Conditions	規格値 Ratings	単位 Unit
接合部温度 Junction temperature	T_j		150	°C
ピーク線返し逆電圧 Repetitive peak reverse voltage	V_{RRM}		600	V
平均順電流 Average forward current	$I_{F(AV)}$	50Hz, 正弦波, 抵抗負荷, $T_c=137^\circ\text{C}$ 50Hz, Sine wave, Resistance load, $T_c=137^\circ\text{C}$	3.0	A
サージ順電流 Surge forward current	I_{FSM}	50Hz, 正弦波, 非線返し, 1サイクル, せん頭値, $T_j=25^\circ\text{C}$ 50Hz, Sine wave, Not-repetitive, 1cycle, Peak value, $T_j=25^\circ\text{C}$	90	A
	I_{FSM1}	tp=1ms, 正弦波, 非線返し, せん頭値, $T_j=25^\circ\text{C}$ tp=1ms, Sine wave, Not-repetitive, Peak value, $T_j=25^\circ\text{C}$	210	A
電流二乗時間積 Current squared time	I^2_t	1ms \leq tp<10ms, $T_j=25^\circ\text{C}$ 1ms \leq tp<10ms, $T_j=25^\circ\text{C}$	28	A ² s

最大瞬間接合部温度は150°C(at $T_c\leq 137^\circ\text{C}$)ですが、安全動作させるための平均動作接合部温度は $T_j\leq 125^\circ\text{C}$ (at $T_c\leq 112^\circ\text{C}$)でご使用ください。

The maximum rated temperature of the is 150°C(at $T_c\leq 137^\circ\text{C}$)

, but in order to operate safely, please use the average operating temperature $T_j\leq 125^\circ\text{C}$ (at $T_c\leq 112^\circ\text{C}$).

モジュール共通 / Module

項目 Item	記号 Symbol	条件 Conditions	規格値 Ratings	単位 Unit
保存温度 Storage temperature	T_{stg}		-40~125	°C
絶縁耐圧 Dielectric strength	V_{dis}	一括端子・ケース間, AC1分間印加 Terminals to case, AC 1minute	2.5	kV
締め付けトルク Mounting Torque	TOR	主端子・取付用(推奨値: 0.8N・m) main terminal fitting part (Recommended Torque : 0.8N・m)	1.5	N・m

●電気的・熱的特性 Electrical and thermal characteristics (指定のない場合は、 $T_c = 25^\circ\text{C}$ / Unless otherwise specified $T_c = 25^\circ\text{C}$.)

コンバータ部 / Converter

ダイオード / Diode

項目 Item	記号 Symbol	条件 Conditions	規格値 Ratings			単位 Unit
			Min.	Typ.	Max.	
順電圧 Forward voltage	V_F	$I_F=10\text{A}$, パルス測定, 1素子当たり $I_F=10\text{A}$, Pulse measurement, Per diode	-	-	1.05	V
逆電流 Reverse current	I_R	$V_R=600\text{V}$, パルス測定, 1素子当たり $V_R=600\text{V}$, Pulse measurement, Per diode	-	-	10	μA

ブレーキ部 / Brake

IGBT

項目 Item	記号 Symbol	条件 Conditions	規格値 Ratings			単位 Unit
			Min.	Typ.	Max.	
コレクタ-エミッタ間降伏電圧 Collector-emitter breakdown voltage	$V_{(BR)CES}$	$I_C=1mA, V_{GE}=0V$	600	-	-	V
コレクタ遮断電流 Zero gate voltage collector current	I_{CES}	$V_{CE}=600V, V_{GE}=0V$	-	-	10	μA
ゲート漏れ電流 Gate-emitter leakage current	I_{GES}	$V_{GE}=\pm 20V, V_{CE}=0V$	-	-	± 1	μA
コレクタ・エミッタ間オン電圧 Static collector-emitter saturation voltage	$V_{CE(sat)}$	$I_C=30A, V_{GE}=15V$	-	1.5	2.0	V
ゲートしきい値電圧 Gate threshold voltage	V_{TH}	$I_C=1mA, V_{CE}=10V$	4.5	6.0	7.5	V
ゲート全電荷量 Total gate charge	Q_g	$V_{CC}=400V, V_{GE}=15V, I_C=30A$	-	95	-	nC
ゲート-エミッタ電荷量 Gate to emitter charge	Q_{ge}		-	28	-	
ゲート-コレクタ電荷量 Gate to collector charge	Q_{gc}		-	39	-	
入力容量 Input capacitance	C_{ies}	$V_{CE}=25V, V_{GE}=0V, f=1MHz$	-	3290	-	pF
帰還容量 Reverse transfer capacitance	C_{res}		-	56	-	
出力容量 Output capacitance	C_{oes}		-	108	-	
ターンオン遅延時間 Turn-on delay time	$t_{d(on)}$	$I_C=30A, V_{CC}=300V, L=100\mu H,$ $V_{GS(+)}=15V, V_{GS(-)}=-15V, R_G=50\Omega$	-	147	-	ns
上昇時間 Rise time	t_r		-	103	-	
ターンオフ遅延時間 Turn-off delay time	$t_{d(off)}$		-	205	-	
降下時間 Fall time	t_f		-	182	-	

ブレーキ部 / Brake

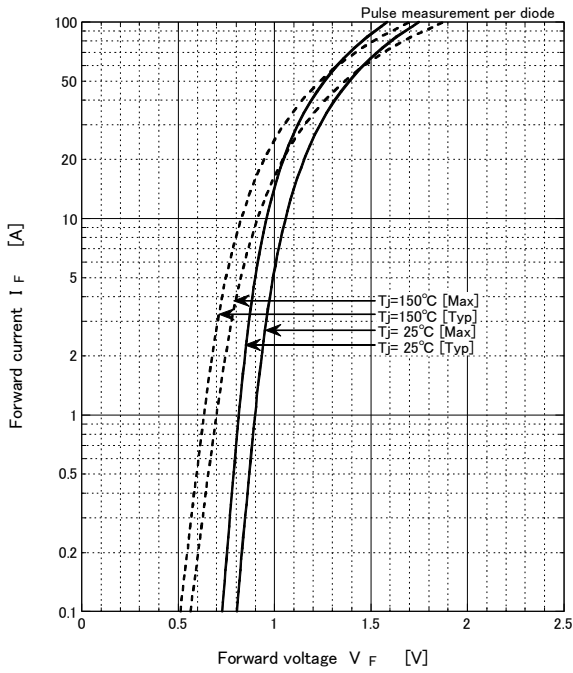
ダイオード / Diode

項目 Item	記号 Symbol	条件 Conditions	規格値 Ratings			単位 Unit
			Min.	Typ.	Max.	
順電圧 Forward voltage	V_F	$I_F=3A$, パルス測定 $I_F=3A$, Pulse measurement	-	-	1.65	V
逆電流 Reverse current	I_R	$V_R=600V$, パルス測定 $V_R=600V$, Pulse measurement	-	-	10	μA
逆回復時間 Reverse recovery time	t_{rr}	$I_F=0.5A, I_R=1.0A, 0.25I_R$	-	-	50	ns

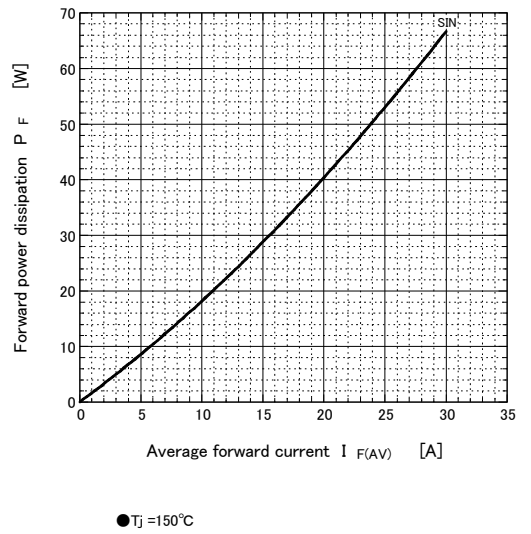
モジュール共通 / Module

項目 Item	記号 Symbol	条件 Conditions	規格値 Ratings			単位 Unit		
			Min.	Typ.	Max.			
熱抵抗 Thermal resistance	$R_{th(j-c)}$	接合部・ケース間 Junction to case	コンバータ部 Converter	モジュールあたり(合計) Per Module (Total)	-	-	0.2	$^{\circ}C/W$
			ブレーキ部 Brake	1素子あたり Per IGBT	-	-	1.0	
				1素子あたり Per Diode	-	-	2.4	

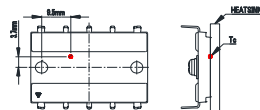
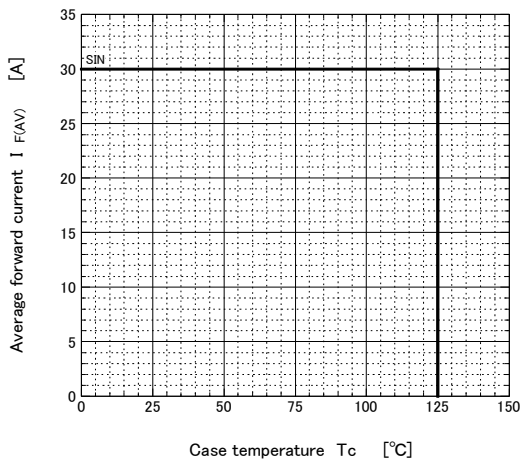
Forward voltage



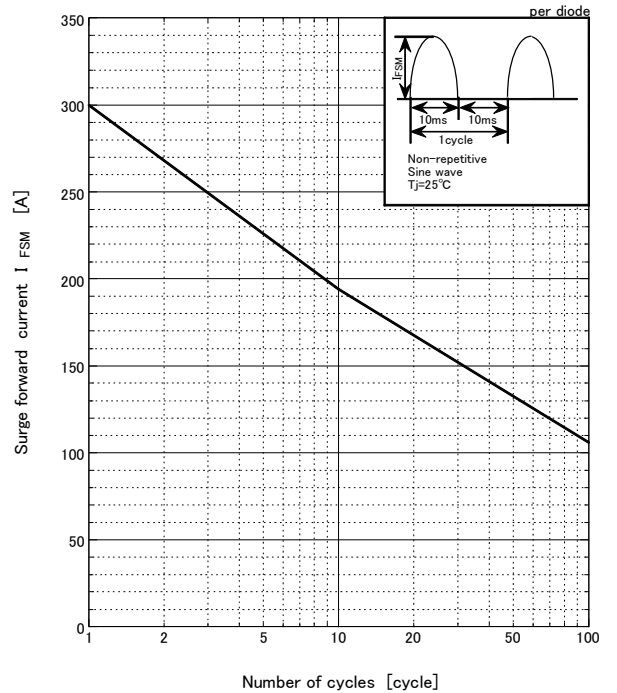
Forward power dissipation

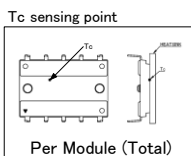
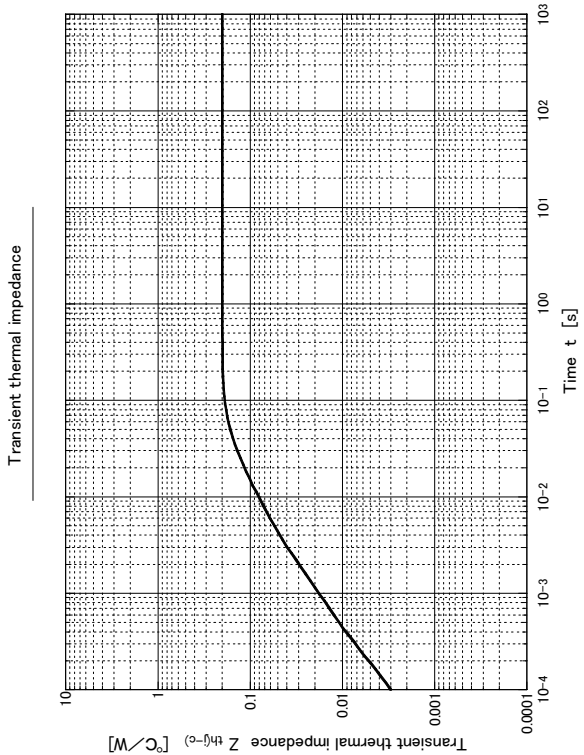
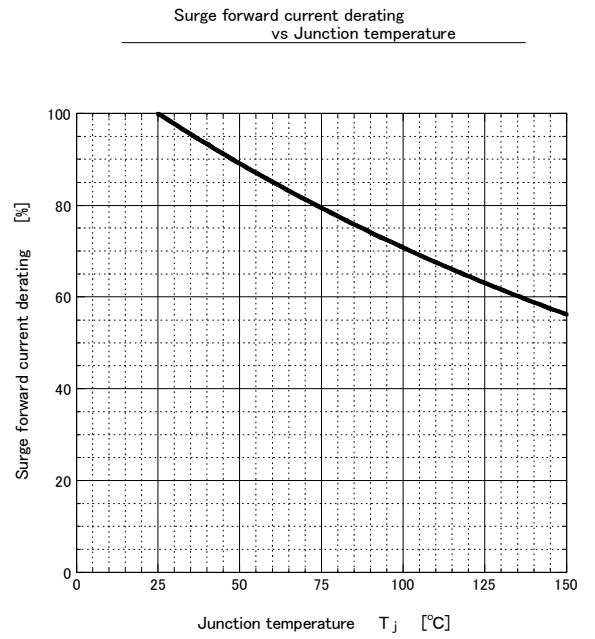
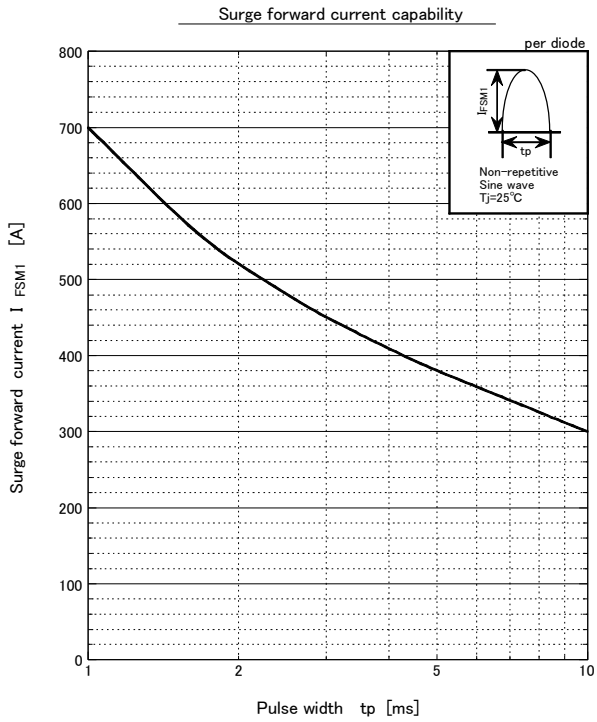


Derating curve

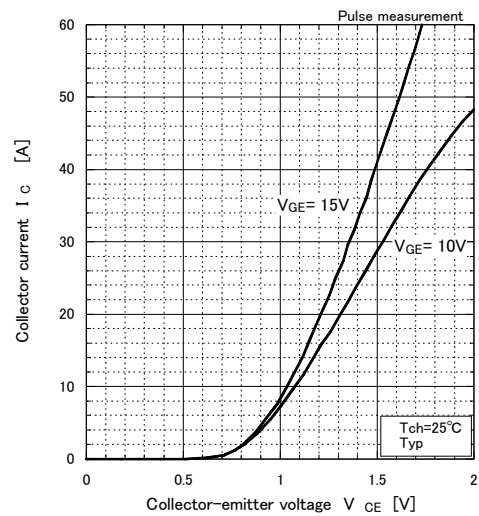


Surge forward current capability



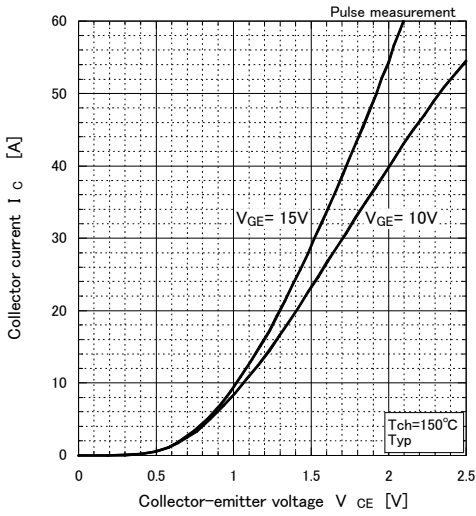


Typical output characteristics



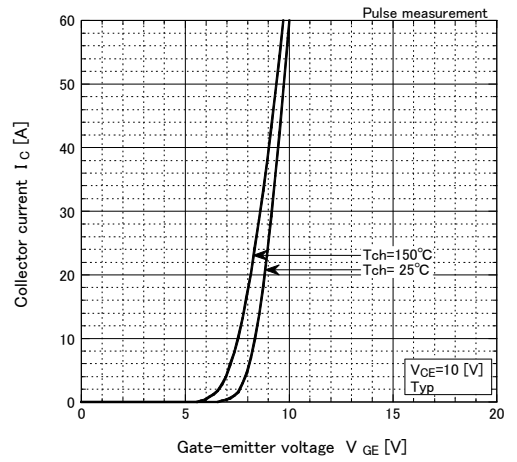
Note: The above characteristics curves are presented for reference only and not guaranteed by production test, unless otherwise noted.

Typical output characteristics



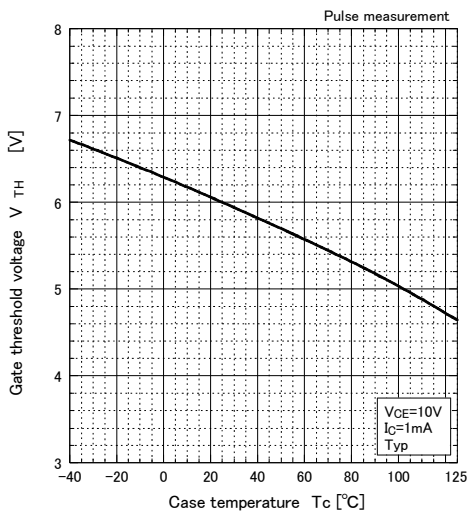
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Transfer characteristics



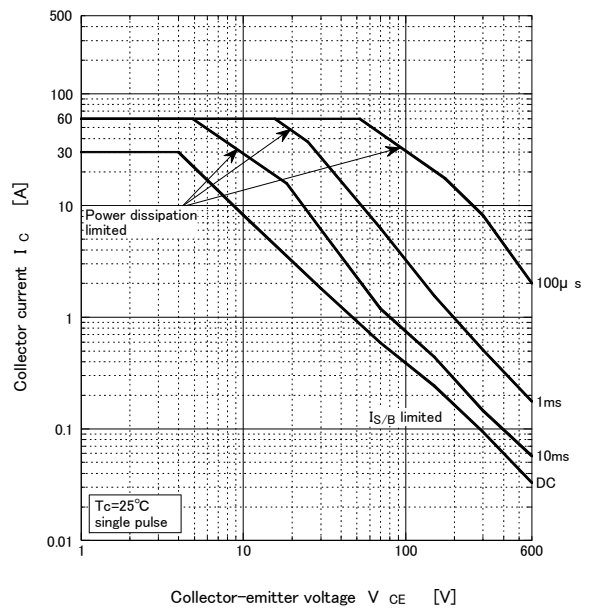
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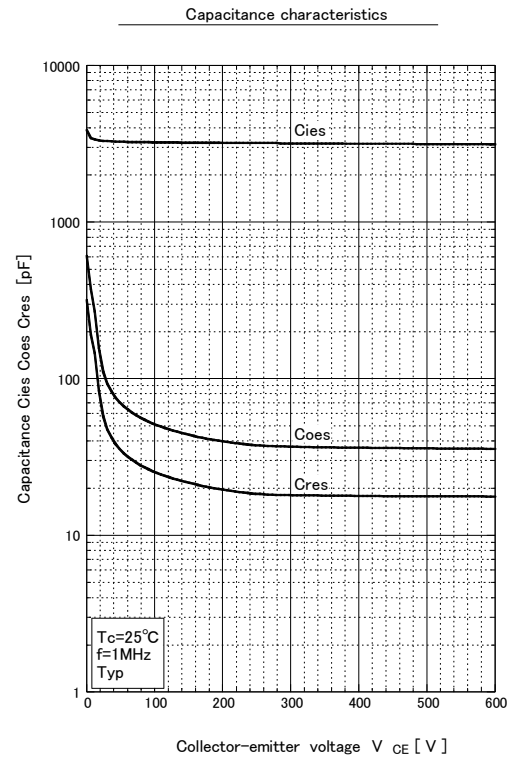
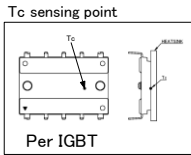
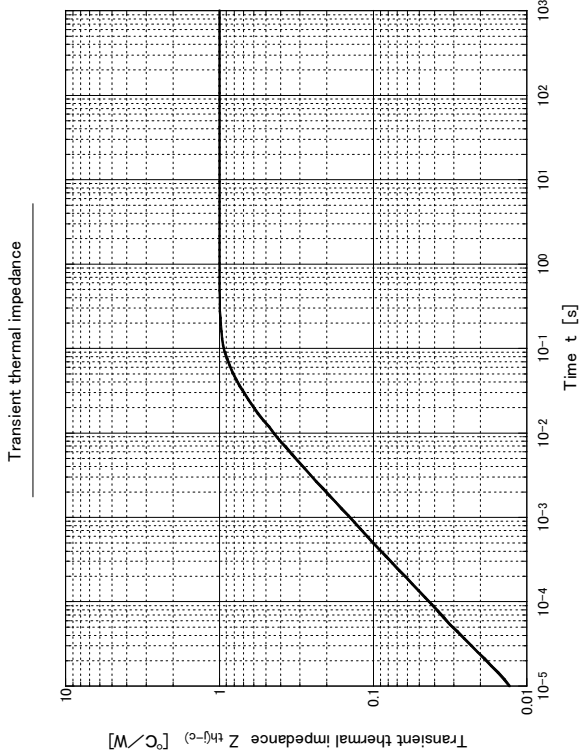
Gate threshold voltage vs case temperature



Note: The above characteristics curves are presented for reference only and not guaranteed by production test unless otherwise noted.

Safe operating area

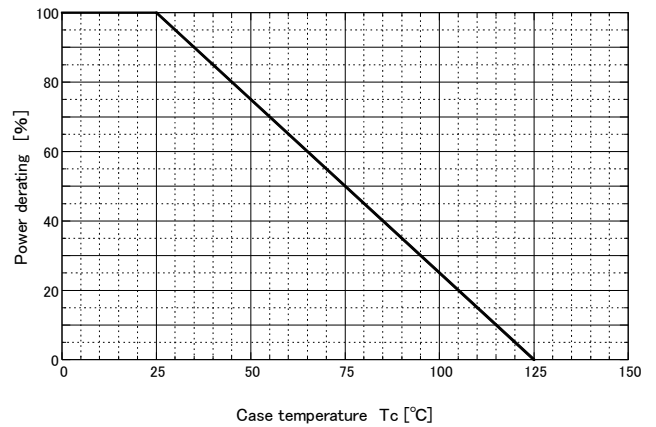
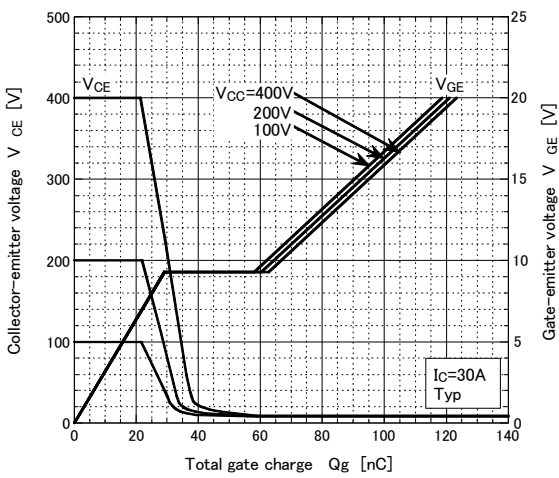




Note: The above characteristics curves are presented for reference only and not guaranteed by production test, unless otherwise noted.

Gate charge characteristics

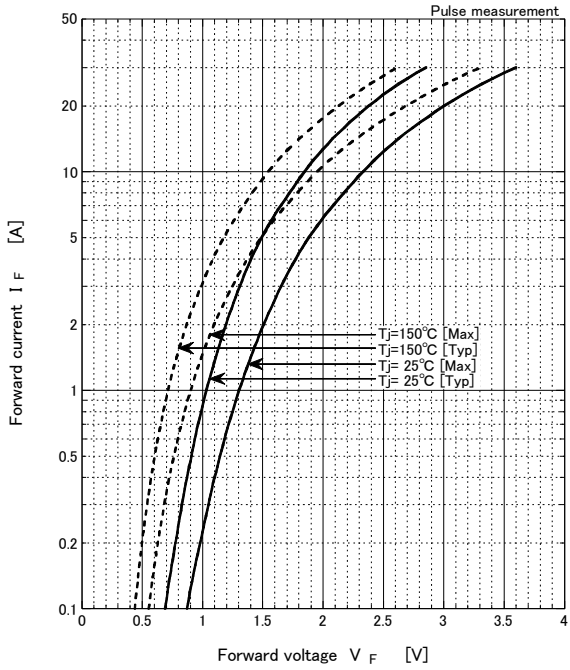
Power derating - case temperature



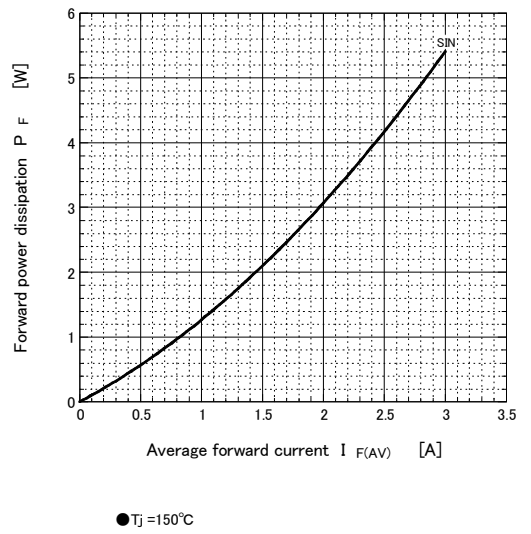
Note: The above characteristics curves are presented for reference only and not guaranteed by production test, unless otherwise noted.

Note: MOS FET characteristics

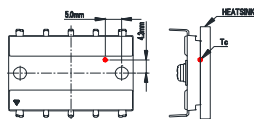
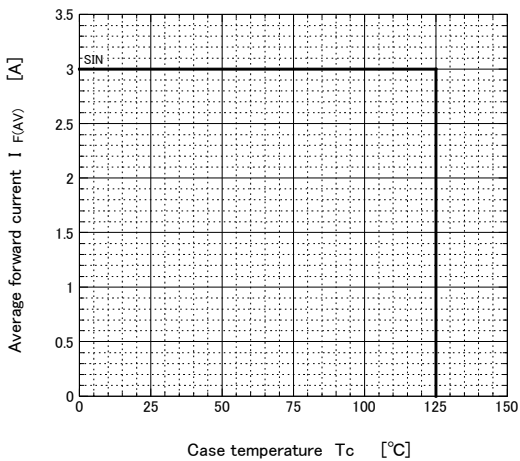
Forward voltage



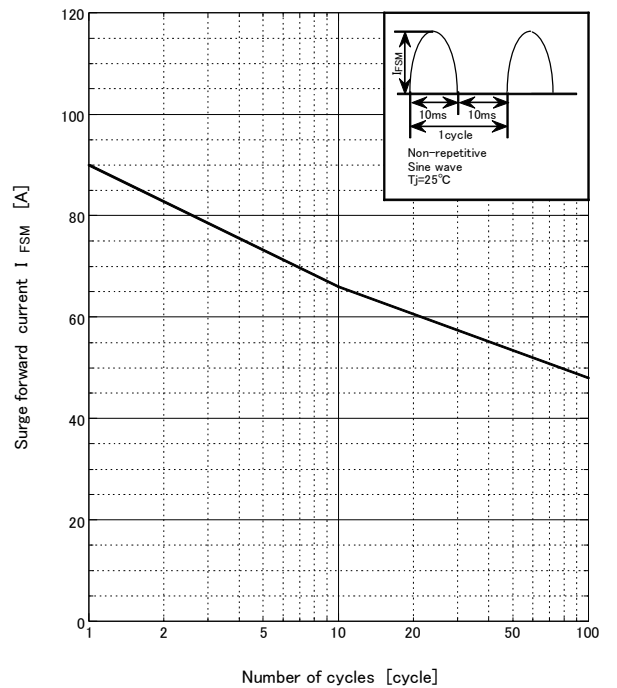
Forward power dissipation

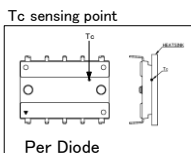
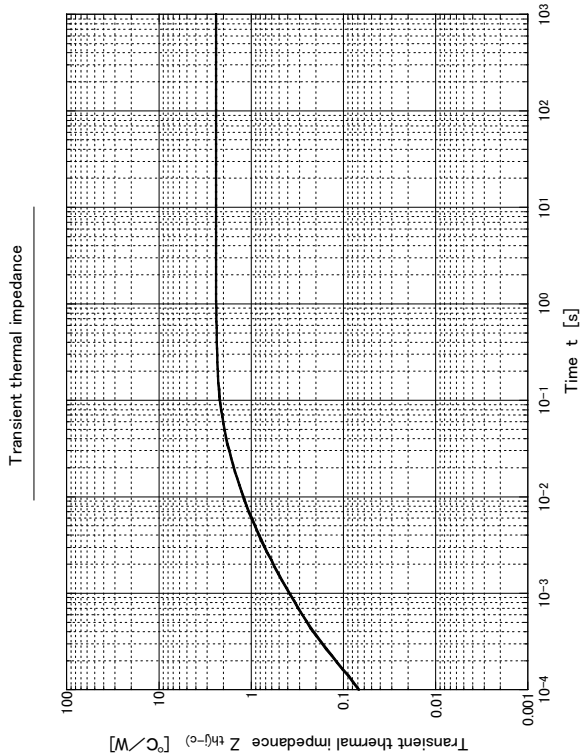
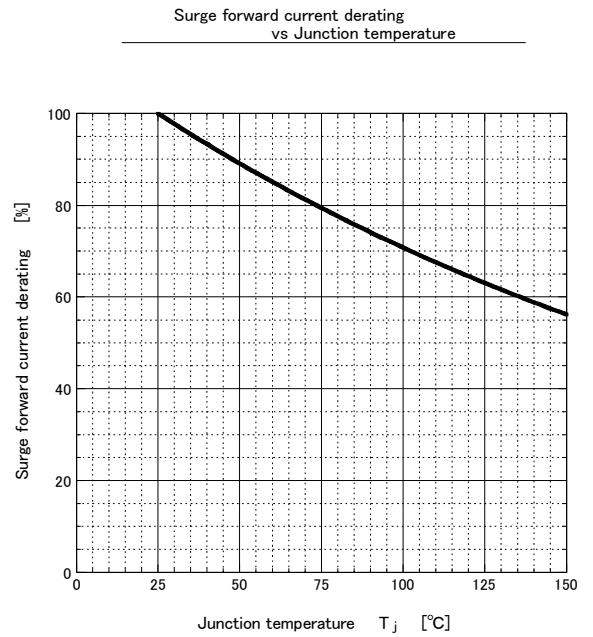
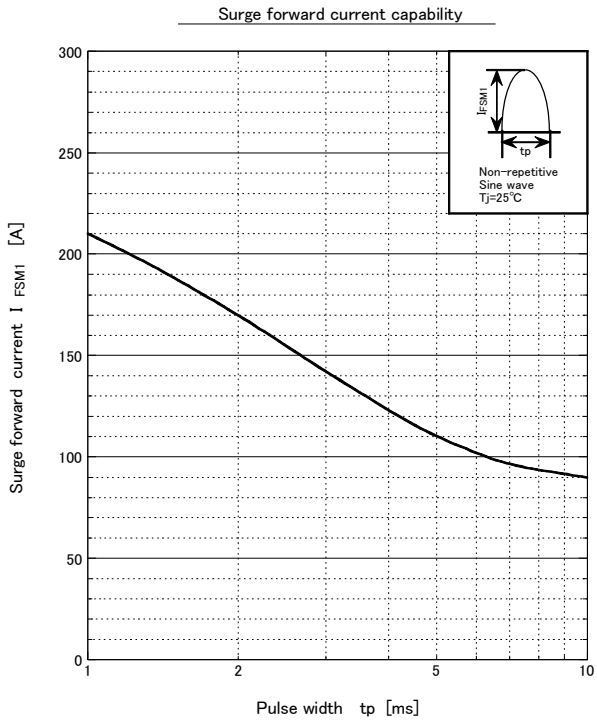


Derating curve



Surge forward current capability



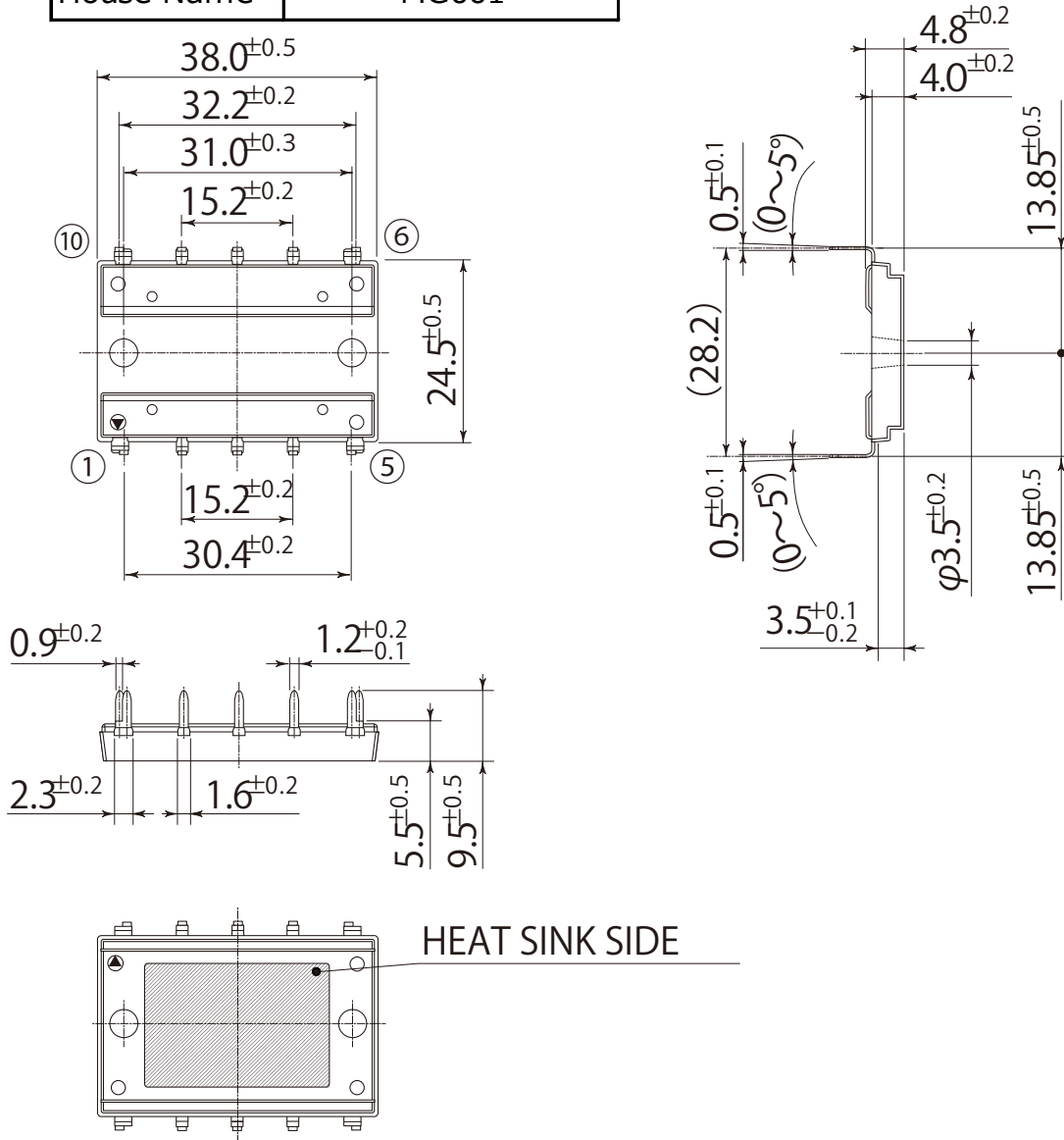


Package Outline-Dimensions

unit : mm
scale: 1/1

F4

JEDEC Code	-
JEITA Code	-
House Name	MG001



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- If you wish to use any such products, please be sure to refer to the specifications.

U182(2019.02)