MG001AK028060A

Converter - Brake Module

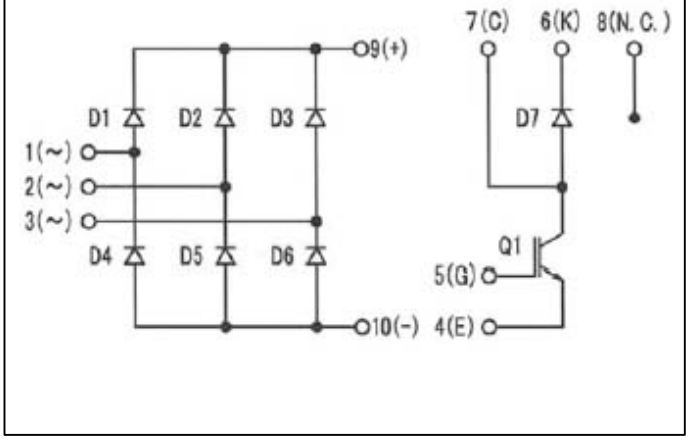
Feature

- 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、Tc = 25℃ / Unless otherwise specified Tc = 25℃. ）

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	℃
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=137℃ 50Hz, Sine wave, Resistance load, T_c=137℃	20	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, Tj=25℃ 50Hz, Sine wave, Not-repetitive, 1cycle, Peak value, Per diode, Tj=25℃	200	A
	I_{FSM1}	tp=1ms, 正弦波, 非繰返し, せん頭値, 1素子当り, Tj=25℃ tp=1ms, Sine wave, Not-repetitive, Peak value, Per diode, Tj=25℃	470	A
電流二乗時間積 Current squared time	I^2t	1ms≦t＜10ms, 1素子当り, Tj=25℃ 1ms≦t<10ms, Per diode, Tj=25℃	140	A^2S

最大瞬間接合部温度は150℃(at T_c≦137℃)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≦125℃(at T_c≦112℃)でご使用ください。

The maximum rated temperature of the is 150℃(at T_c≦137℃)

, but in order to operate safely, please use the average operating temperature T_j≦125℃(at T_c≦112℃).

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	℃
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		28	A
コレクタ電流 (ピーク) Continuous collector current (Peak)	I_{CP}	パルス幅 10μs, Duty = 1/100 Pulse width 10μs, Duty = 1/100	56	A
全損失 Total power dissipation	P_T		96	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	℃
ピーク繰返し逆電圧 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℃ 50Hz, Sine wave, Resistance load, T_c=137℃	3.0	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, Tj=25℃ 50Hz, Sine wave, Not-repetitive, 1cycle, Peak value, Tj=25℃	90	A
	I_{FSM1}	tp=1ms, 正弦波, 非繰返し, せん頭値, Tj=25℃ tp=1ms, Sine wave, Not-repetitive, Peak value, Tj=25℃	210	A
電流二乗時間積 Current squared time	I^2t	1ms≦tp＜10ms, Tj=25℃ 1ms≦tp<10ms, Tj=25℃	28	A^2s

最大瞬間接合部温度は150℃(at T_c≦137℃)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≦125℃(at T_c≦112℃)でご使用ください。

The maximum rated temperature of the is 150℃(at T_c≦137℃)

, but in order to operate safely, please use the average operating temperature T_j≦125℃(at T_c≦112℃).

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	℃
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、Tc = 25℃ / Unless otherwise specified Tc = 25℃. ）

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=7A, パルス測定, 1素子当たり I_F=7A, Pulse measurement, Per diode	–	–	1.05	V
逆電流 Reverse current	I_R	V_R=600V, パルス測定, 1素子当たり V_R=600V, 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 Min.	Typ.	Max.	単位 Unit
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}=±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=28A, V_{GE}=15V	–	1.70	2.25	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	Qg	V_{CC}=400V, V_{GE}=15V, I_C=28A	–	69	–	nC
ゲート-エミッタ電荷量 Gate to emitter charge	Qge		–	21	–	
ゲート-コレクタ電荷量 Gate to collector charge	Qgc		–	31	–	
入力容量 Input capacitance	Cies	V_{CE}=25V, V_{GE}=0V, f=1MHz	–	2240	–	pF
帰還容量 Reverse transfer capacitance	Cres		–	40	–	
出力容量 Output capacitance	Coes		–	77	–	
ターンオン遅延時間 Turn-on delay time	td(on)	I_C=28A, V_{CC}=300V, L=100μH, $V_{GS(+)}$=15V, $V_{GS(-)}$=-15V, R_G=50Ω	–	134	–	ns
上昇時間 Rise time	tr		–	107	–	
ターンオフ遅延時間 Turn-off delay time	td(off)		–	130	–	
降下時間 Fall time	tf		–	174	–	

ブレーキ部 / Brake

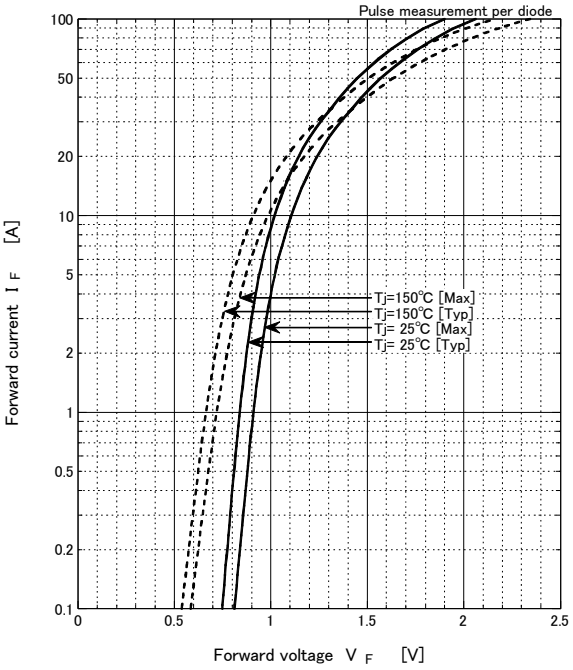
ダイオード / Diode

項目 Item	記号 Symbol	条件 Conditions	規格値 Ratings Min.	Typ.	Max.	単位 Unit
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	trr	I_F=0.5A, I_R=1.0A, 0.25I_R	–	–	50	ns

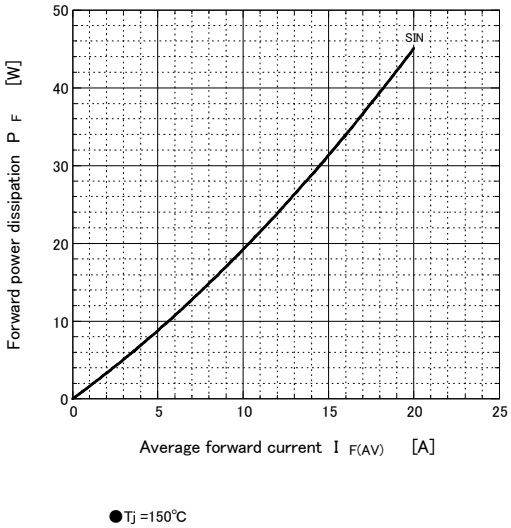
モジュール共通 / Module

項目 Item	記号 Symbol	条件 Conditions			規格値 Ratings Min.	Typ.	Max.	単位 Unit
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)	–	–	0.28	℃/W
			ブレーキ部 Brake	1素子あたり Per IGBT	–	–	1.30	
				1素子あたり Per Diode	–	–	2.40	

Forward voltage

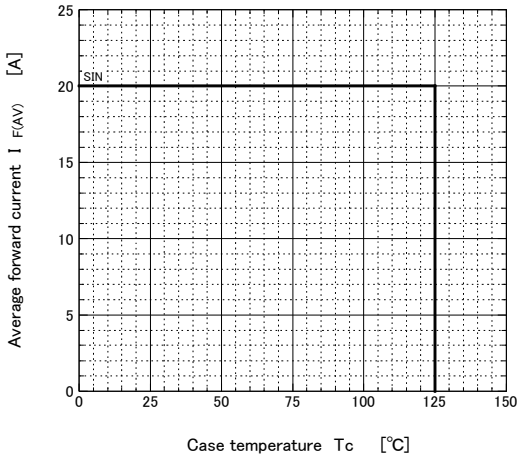


Forward power dissipation

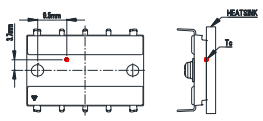


●Tj =150℃

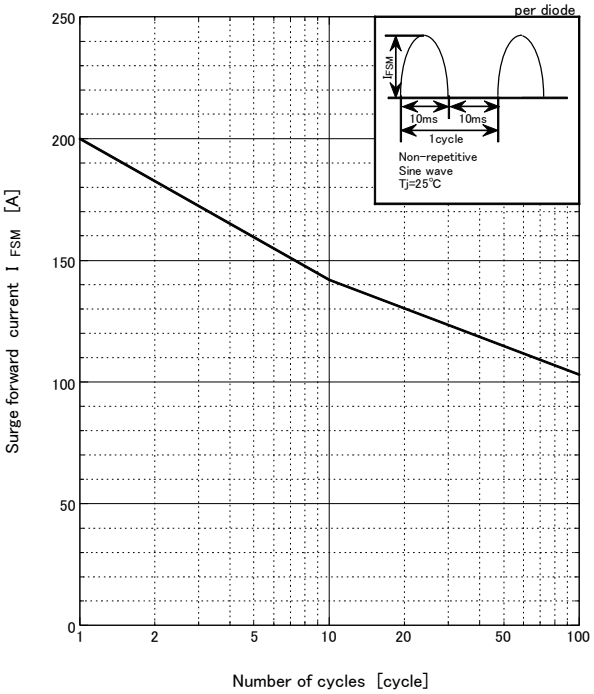
Derating curve



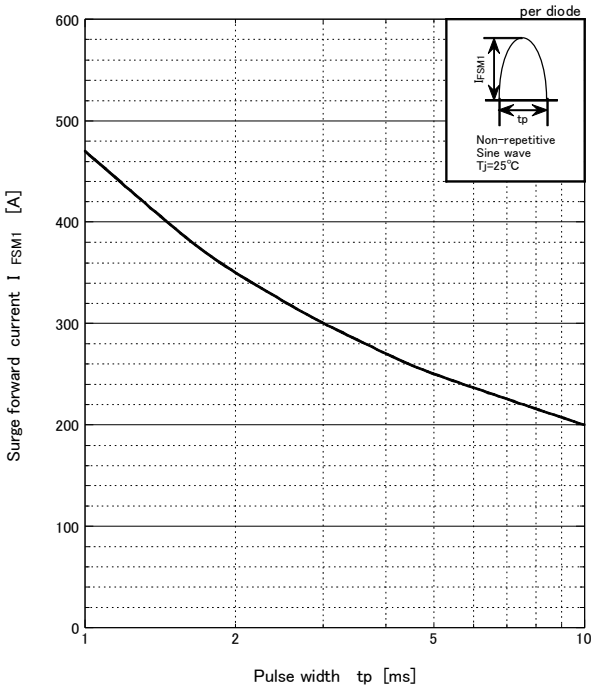
●V_R = 600V
R-load
With heatsink



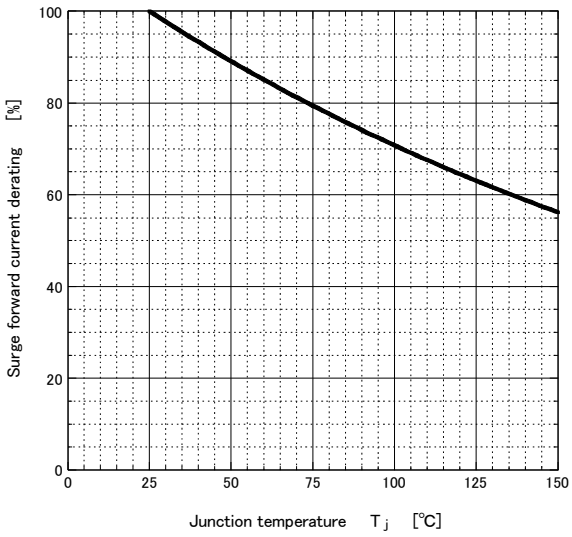
Surge forward current capability



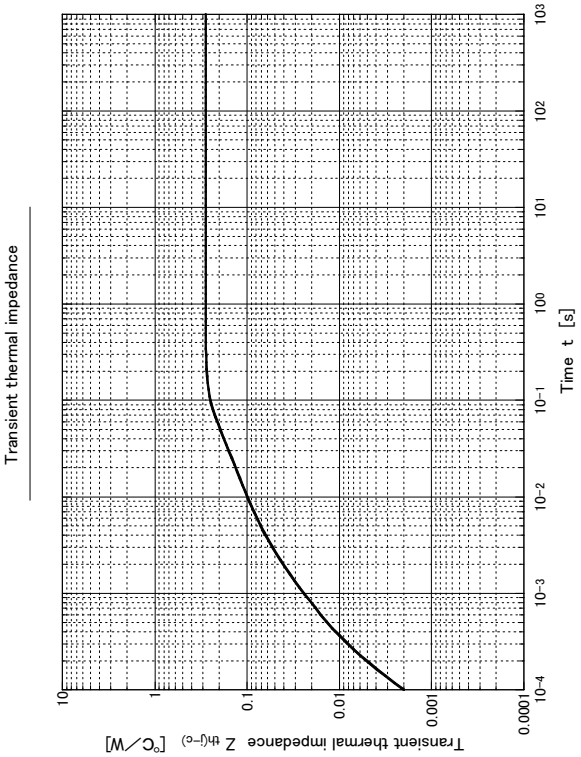
Surge forward current capability



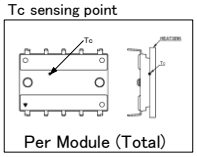
Surge forward current derating
vs Junction temperature



Transient thermal impedance

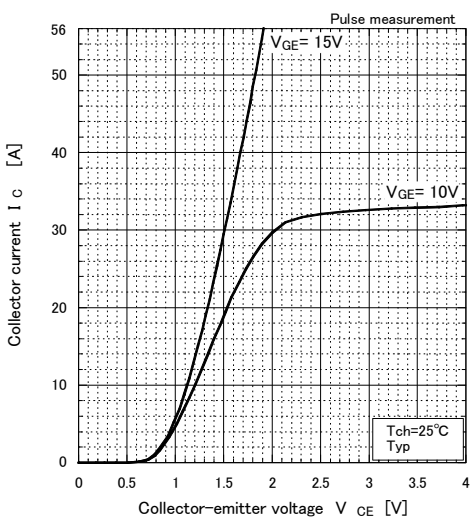


Tc sensing point



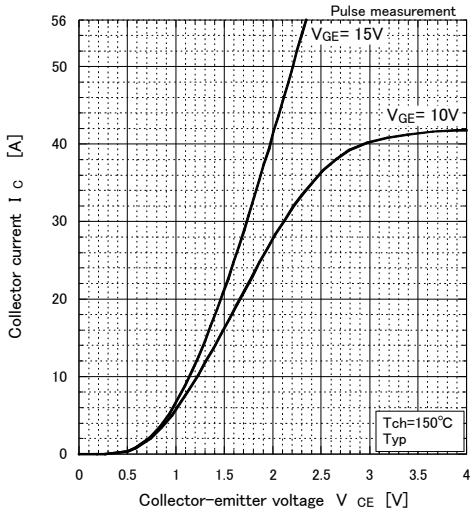
Per Module (Total)

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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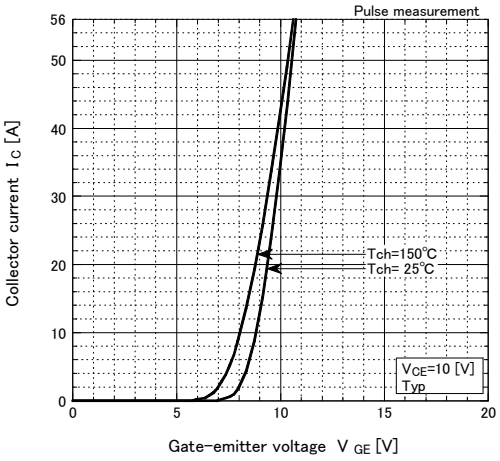
Transfer characteristics



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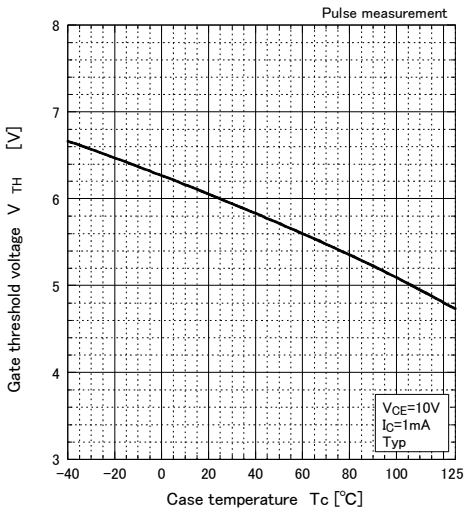
Gate threshold voltage
vs case temperature



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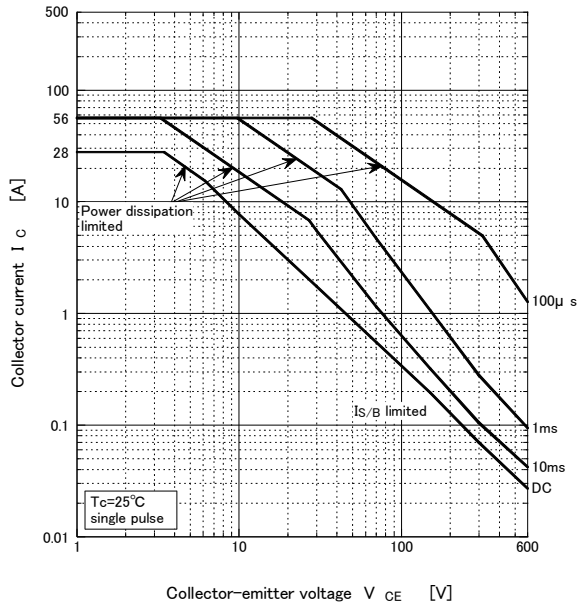
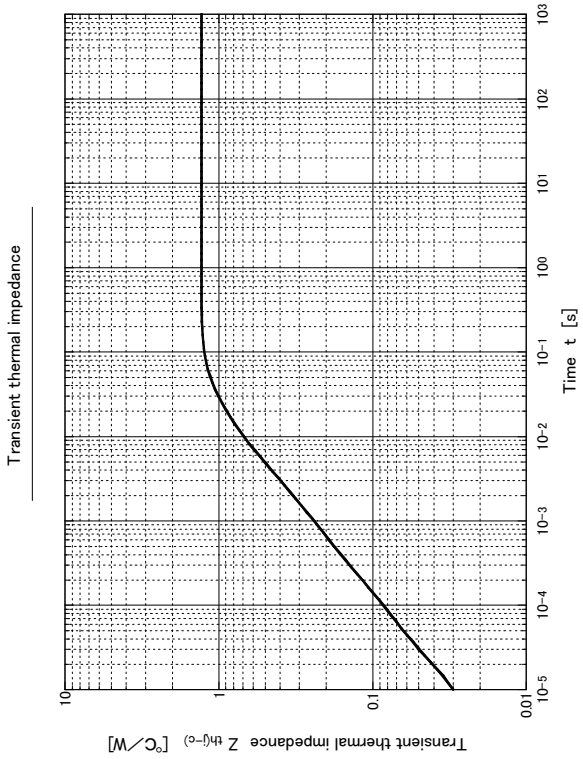
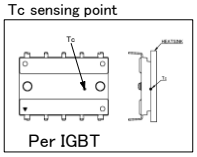
Safe operating area

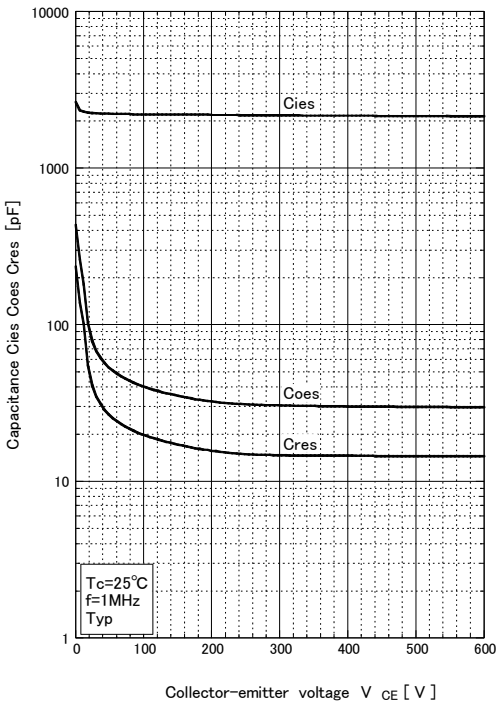




Tc sensing point

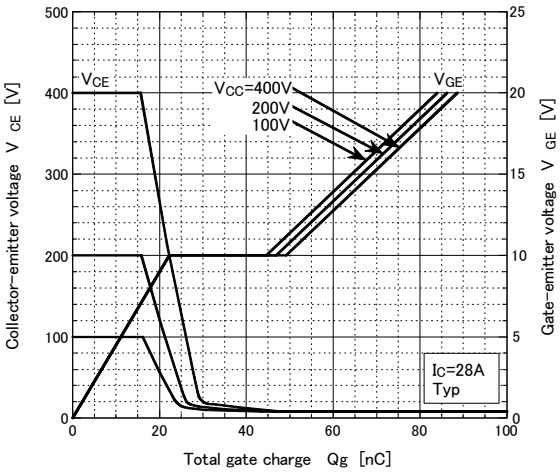


Capacitance characteristics



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

Gate charge characteristics



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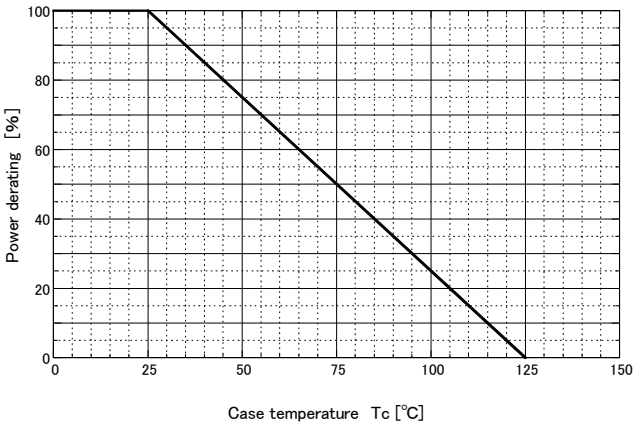
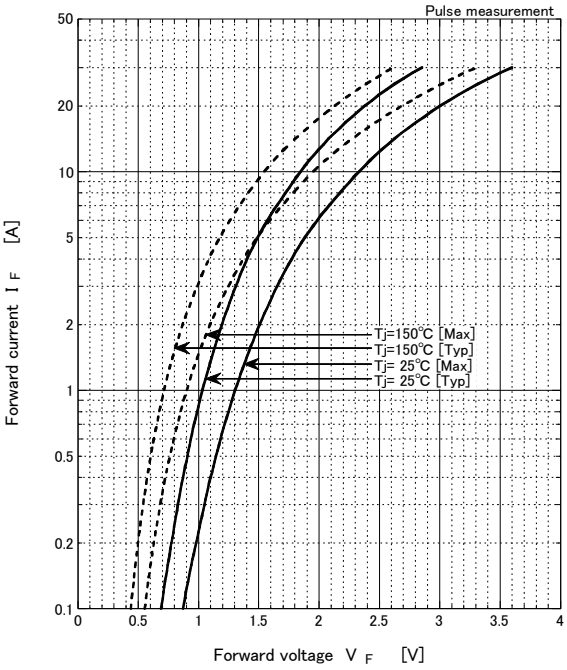
Power derating – case temperature

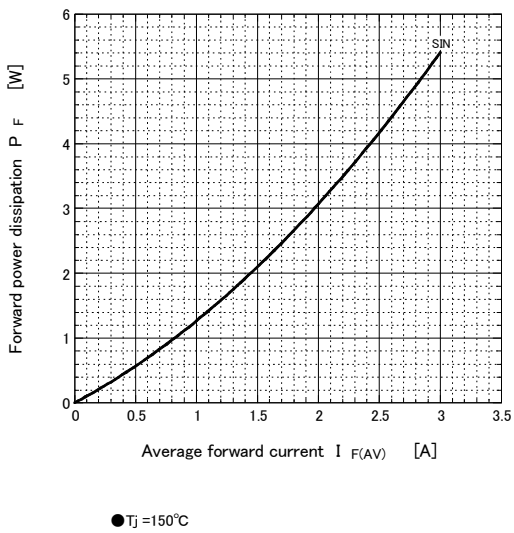


Note: MOS FET characteristics

Forward voltage

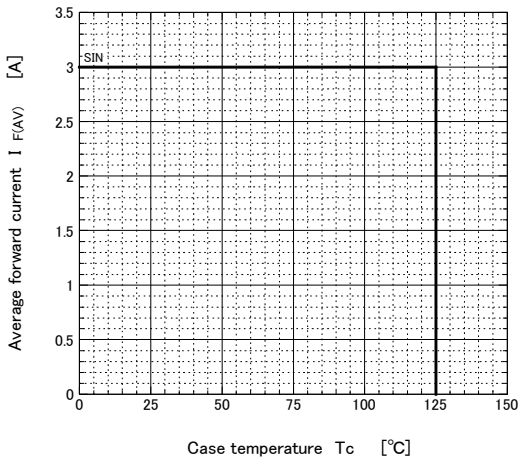


Forward power dissipation

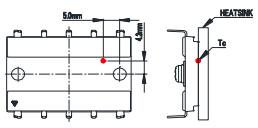


●Tj =150°C

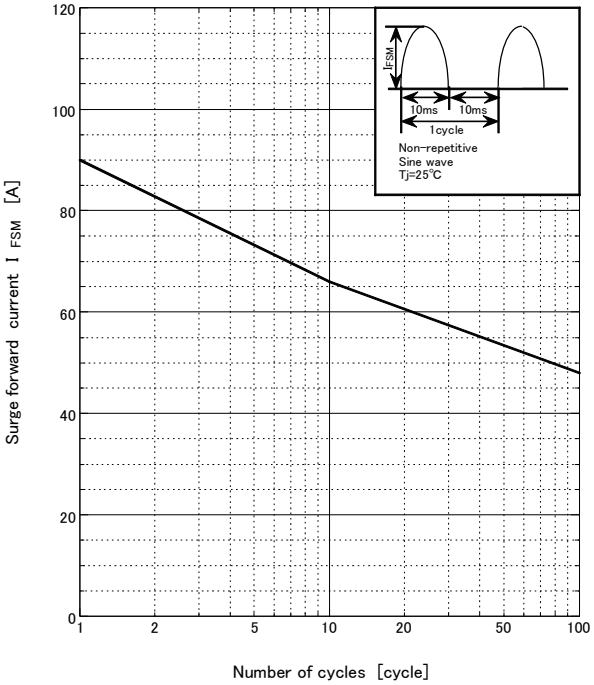
Derating curve



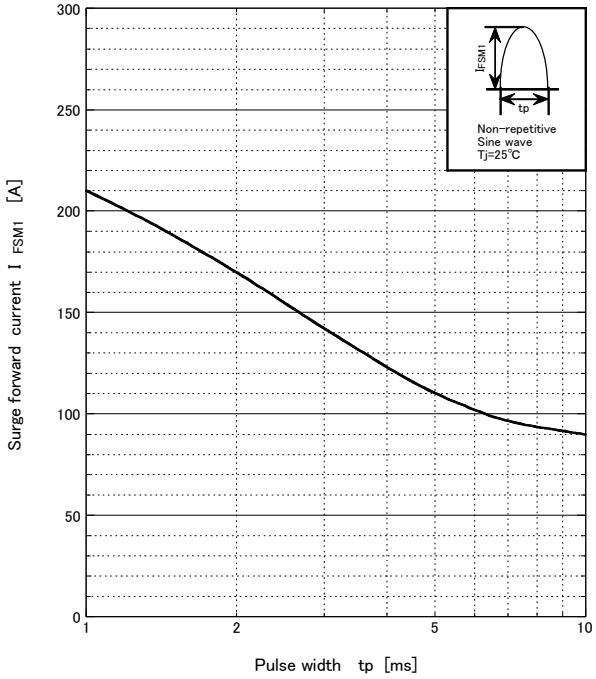
●VR = 600V
R-load
With heatsink



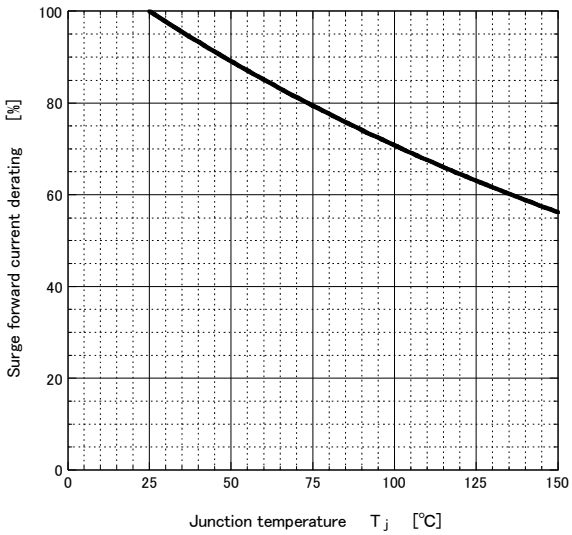
Surge forward current capability



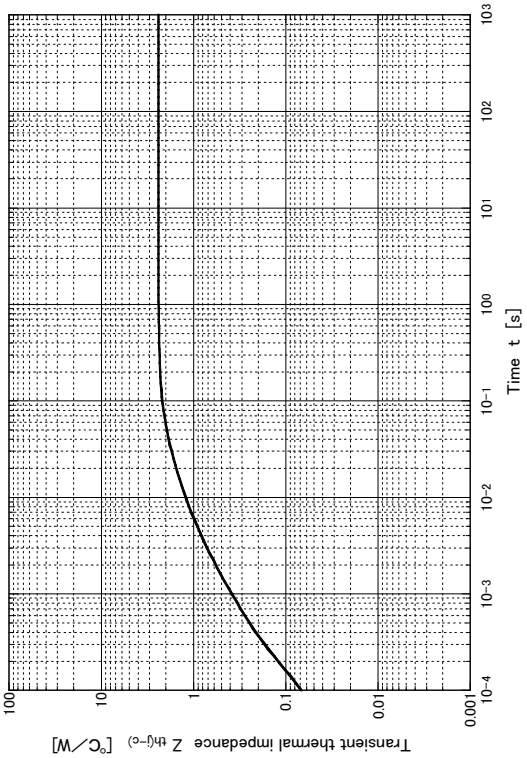
Surge forward current capability

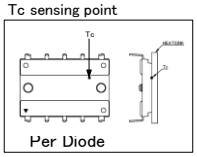


Surge forward current derating
vs Junction temperature



Transient thermal impedance



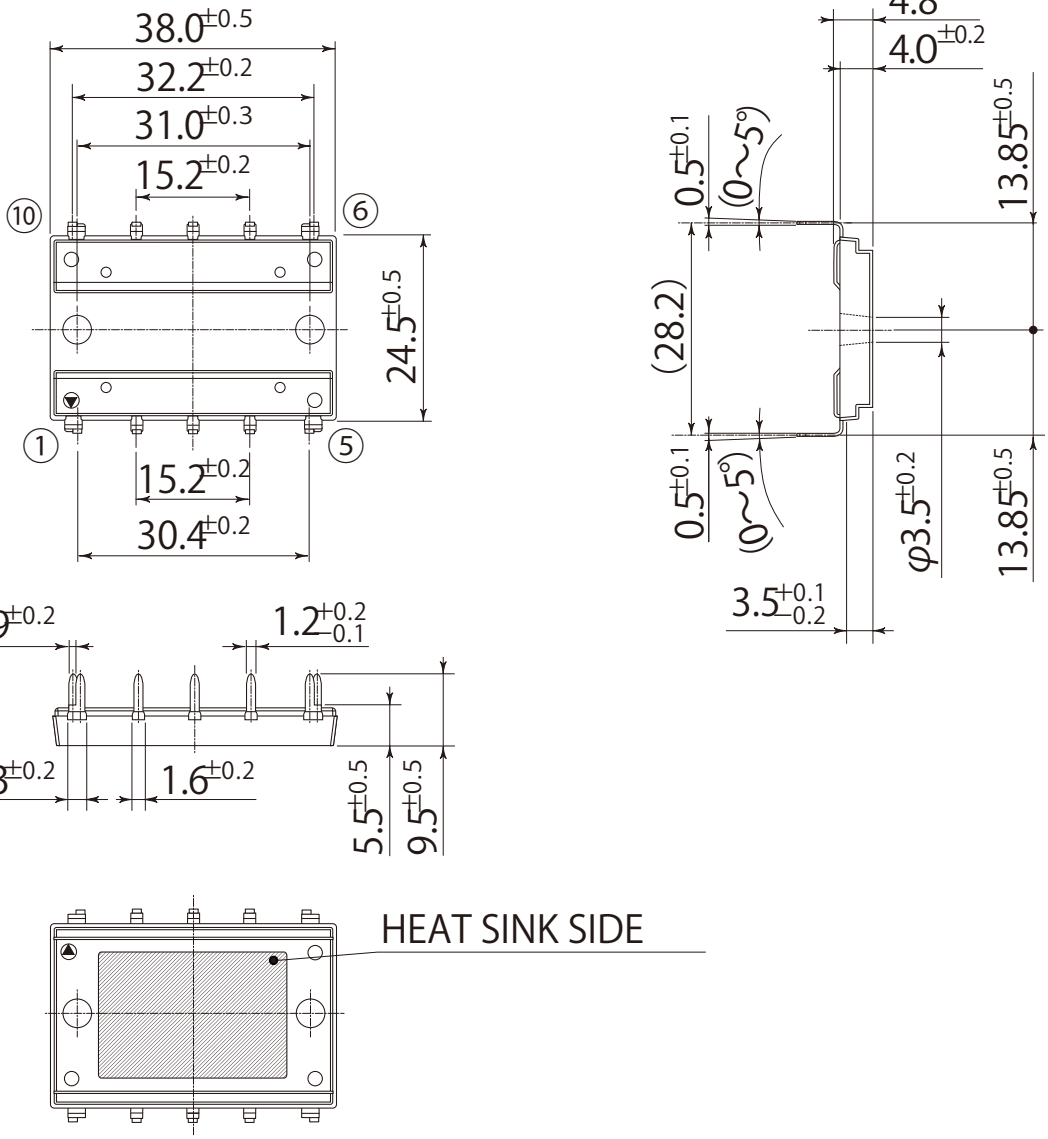


Package Outline-Dimensions

unit : mm
scale: 1/1

F4

JEDEC Code	–
JEITA Code	–
House Name	MG001



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   Transportation equipment (vehicles, ships, etc.), trunk-line communication equipment, traffic signal control systems, anti-disaster/crime systems, safety equipment, medical equipment, etc.
   【Specific applications】
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