MG031N110006A

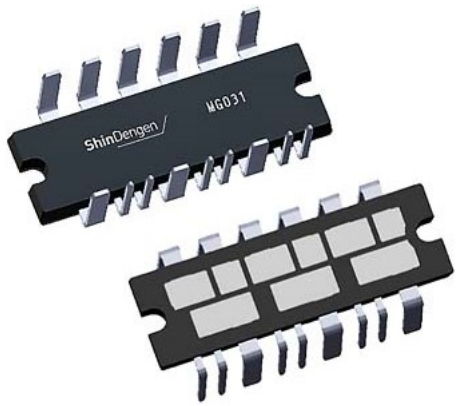
3 phase Inverter Module

Feature

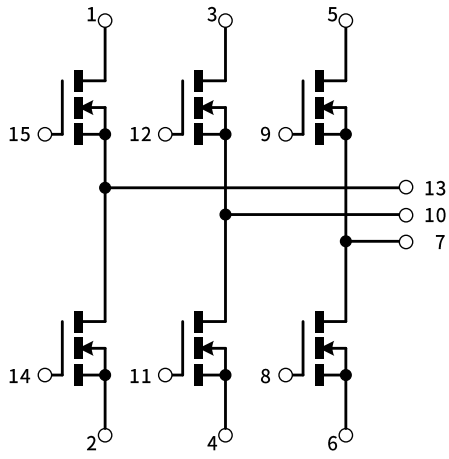
- 3 phase Inverter
- MOSFET(N-channel)
- High current capacity
- Low Ron
- Halogen free
- Pb free terminal
- RoHS:Yes

Outline

House Name: MG031



Equivalent circuit



Absolute maximum ratings （Tc = 25℃ unless otherwise specified ）

MOSFET

Item	Symbol	Conditions	Ratings	Unit
Channel temperature	Tch		175	℃
Drain-source voltage	V_{DSS}		60	V
Gate-source voltage	V_{GSS}		±20	V
Continuous drain current (DC)	I_D		110	A
Continuous drain current (Peak)	I_{DP}	Pulse width 10μs, Duty = 1/100	440	A
Total power dissipation	P_T		154	W
Single avalanche current	I_{AS}	Starting Tch=25℃ Tch≦150℃	44	A
Single avalanche energy	E_{AS}	Starting Tch=25℃ Tch≦150℃	232	mJ

Module

Item	Symbol	Conditions	Ratings	Unit
Storage temperature	Tstg		-55～150	℃
Mounting torque	TOR	Fixing screw M3	0.8	N・m

Electrical and thermal characteristics （Tc=25℃ unless otherwise specified.）

These are characteristics of the 1 chip unless otherwise specified.

MOSFET

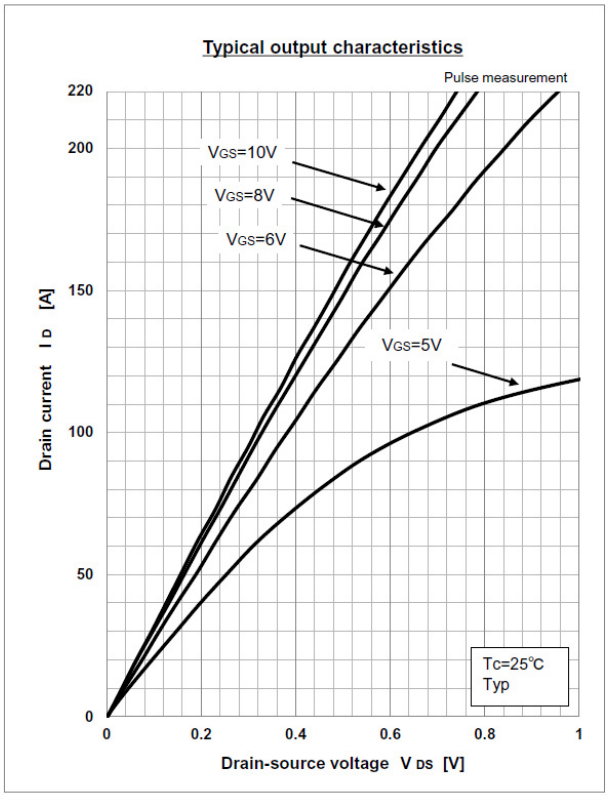
Item	Symbol	Conditions		Ratings			Unit
				Min.	Typ.	Max.	
Drain-source breakdown voltage	$V_{(BR)DSS}$	I_D=1mA, V_{GS}=0V		60	—	—	V
Zero gate voltage drain current	I_{DSS}	V_{DS}=60V, V_{GS}=0V		—	—	1.0	μA
Gate-source leakage current	I_{GSS}	V_{GS}=±20V, V_{DS}=0V		—	—	±0.1	μA
Static drain-source on-state resistance	$R_{DS(ON)}$	Chip	I_D=55A, V_{GS}=10V	—	2.4	—	mΩ
		Terminal	I_D=55A, V_{GS}=10V	—	2.9	3.8	mΩ
Gate threshold voltage	V_{TH}	I_D=1mA, V_{DS}=10V		2.0	3.0	4.0	V
Source-drain diode forward voltage	V_{SD}	Is=110A, V_{GS}=0V		—	—	1.5	V
Total gate charge	Qg	V_{DD}=48V, V_{GS}=10V, I_D=110A (Electrical characteristics of discrete MOSFET device)		—	96	—	nC
Gate to source charge	Qgs			—	25	—	
Gate to drain charge	Qgd			—	32	—	
Input capacitance	Ciss	V_{DS}=25V, V_{GS}=0V, f=1MHz (Electrical characteristics of discrete MOSFET device)		—	5535	—	pF
Reverse transfer capacitance	Crss			—	262	—	
Output capacitance	Coss			—	582	—	
Turn-on delay time	td(on)	ID=55A, VDD=30V, RL=0.55Ω, Rg=0Ω, VGS(+)=10V, VGS(−)=0V (Electrical characteristics of discrete MOSFET device)		—	10	—	ns
Rise time	tr			—	54	—	
Turn-off delay time	td(off)			—	60	—	
Fall time	tf			—	56	—	
Source-drain diode reverse recovery time	trr	IF=110A, VGS=0V, di/dt=100A/μs		—	37	—	ns
Source-drain diode reverse recovery charge	Qrr			—	61	—	nC

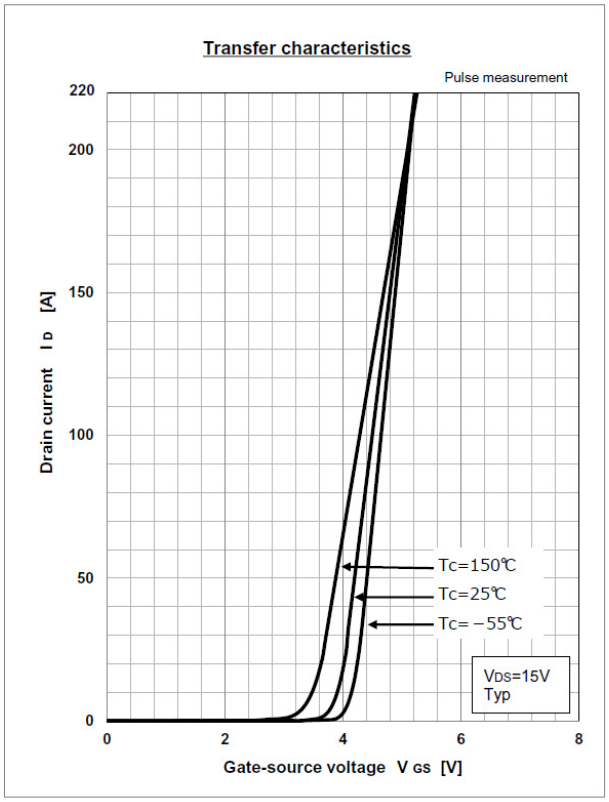
Module

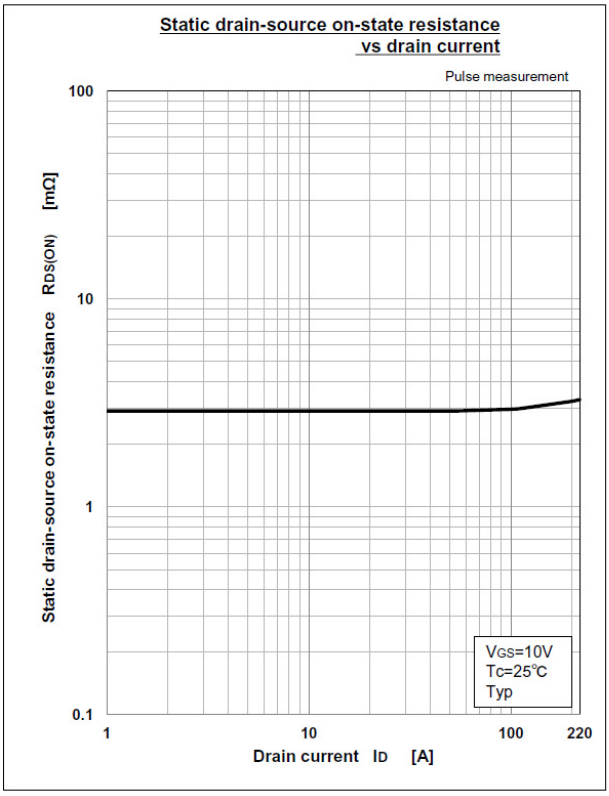
Item	Symbol	Conditions	Ratings			Unit
			Min.	Typ.	Max.	
Thermal resistance	$R_{th(j-c)}$	Junction to case	—	—	0.97	℃/W
	$R_{th(j-l)}$	Junction to lead	—	—	1.41	
		Junction to lead, With insulating sheet, Thickness 0.3mm, Thermal conductivity 3.9W/mK	—	—	2.16	

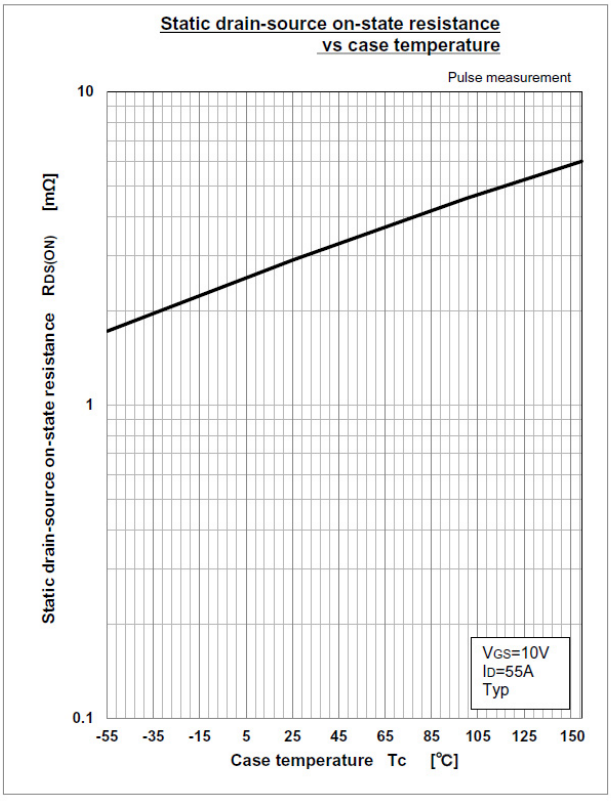
Note：Thermal resistance was measured at Q3

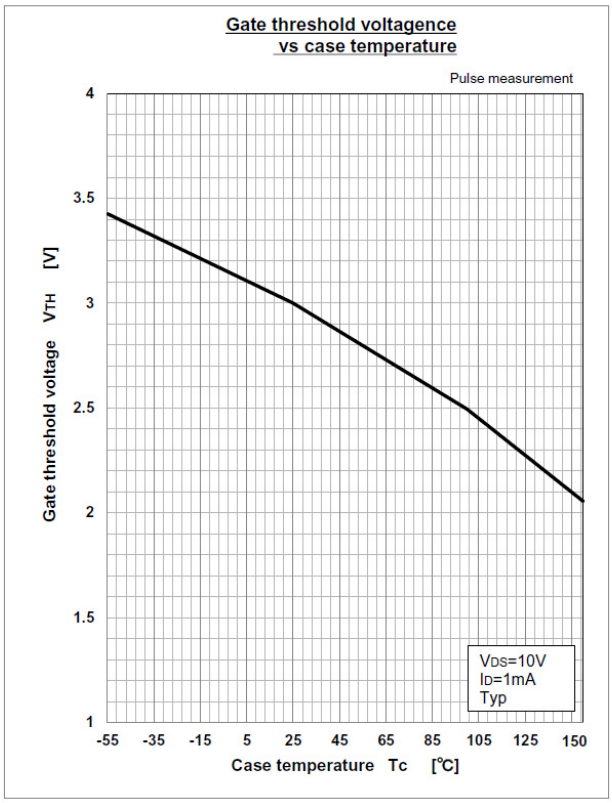
CHARACTERISTIC DIAGRAMS

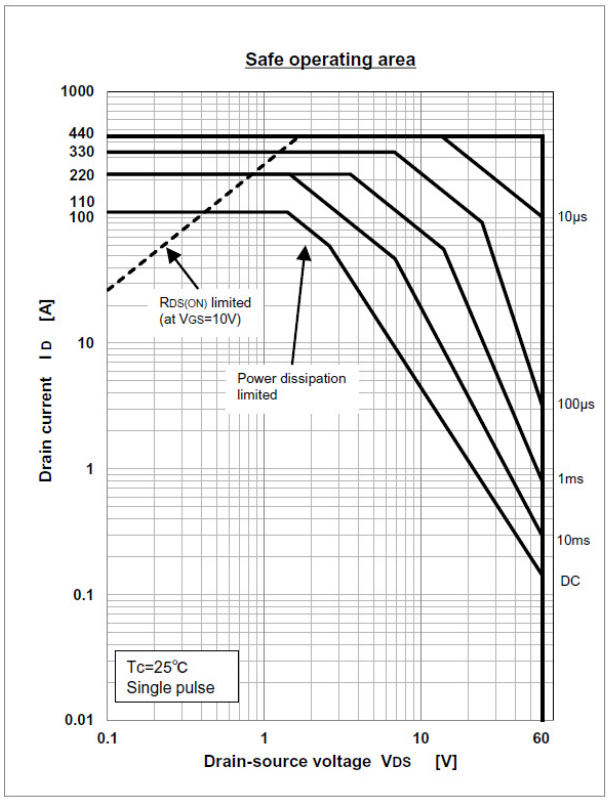


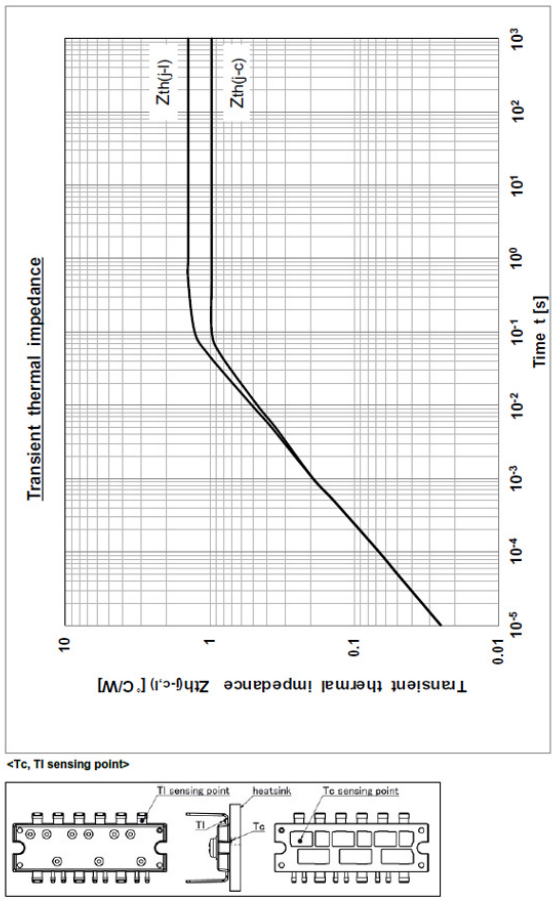


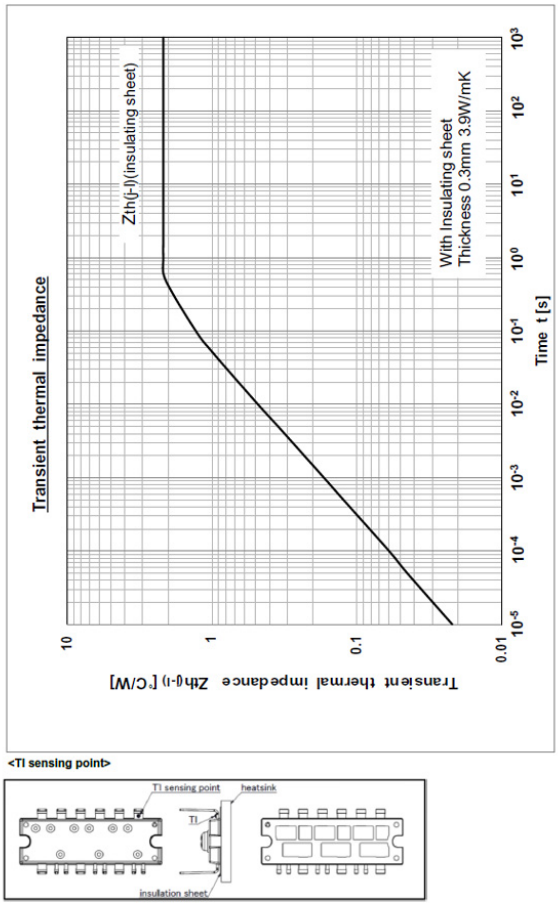




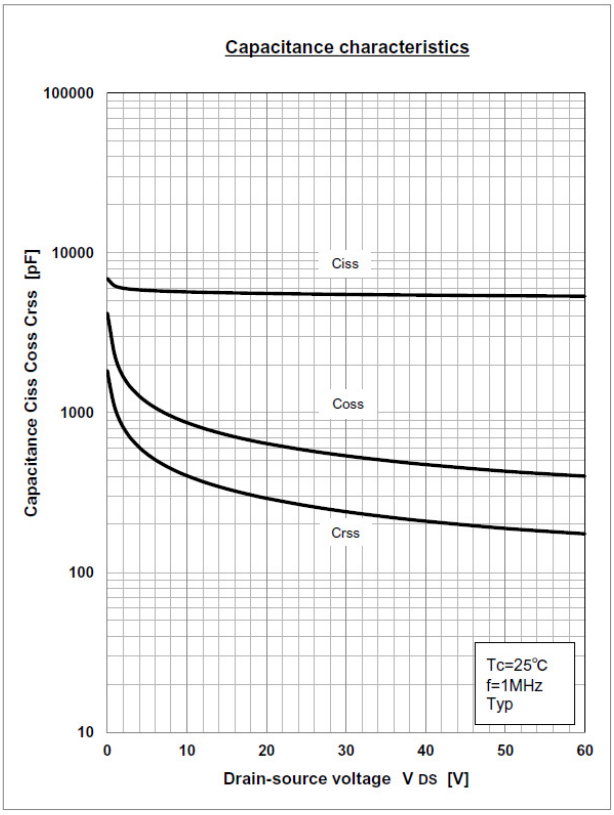

Gate threshold voltagence
vs case temperature
Pulse measurement
Gate threshold voltage VTH [V]
Case temperature Tc [℃]
VDS=10V
ID=1mA
Typ

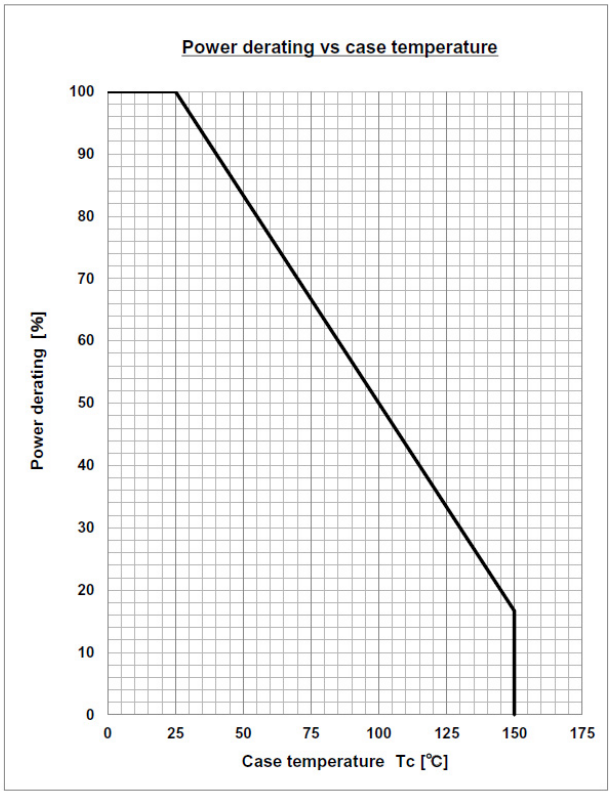

Safe operating area
Drain current ID [A]
Drain-source voltage VDS [V]
RDS(ON) limited
(at VGS=10V)
Power dissipation
limited
Tc=25℃
Single pulse
10μs
100μs
1ms
10ms
DC


Transient thermal impedance
Time t [s]
Zth(j-l)
Zth(j-c)
<Tc, Tl sensing point>
Tl sensing point
heatsink
Tc sensing point
Tl
Tc


Transient thermal impedance
Time t [s]
Zth(j-l)(insulating sheet)
With Insulating sheet
Thickness 0.3mm 3.9W/mK
<Tl sensing point>
Tl sensing point
heatsink
Tl
insulation sheet

This figure shows the data of a discrete MOSFET device.





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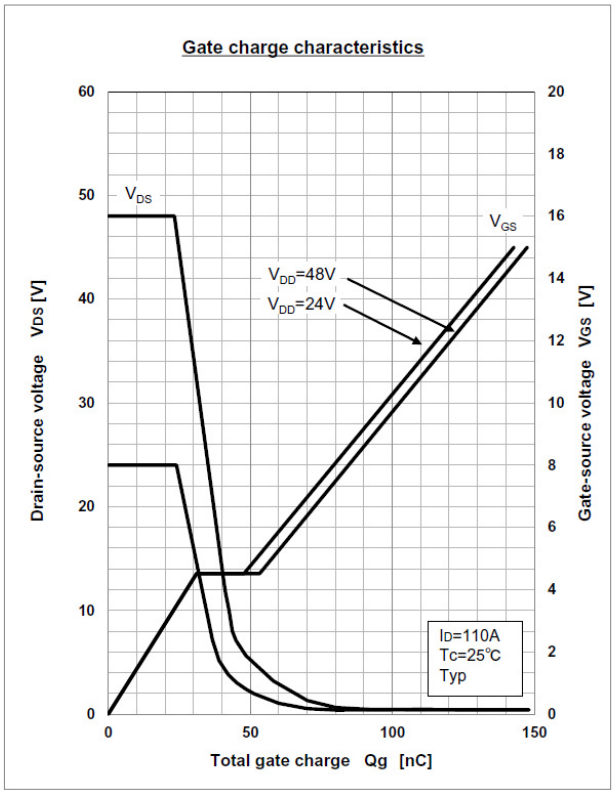
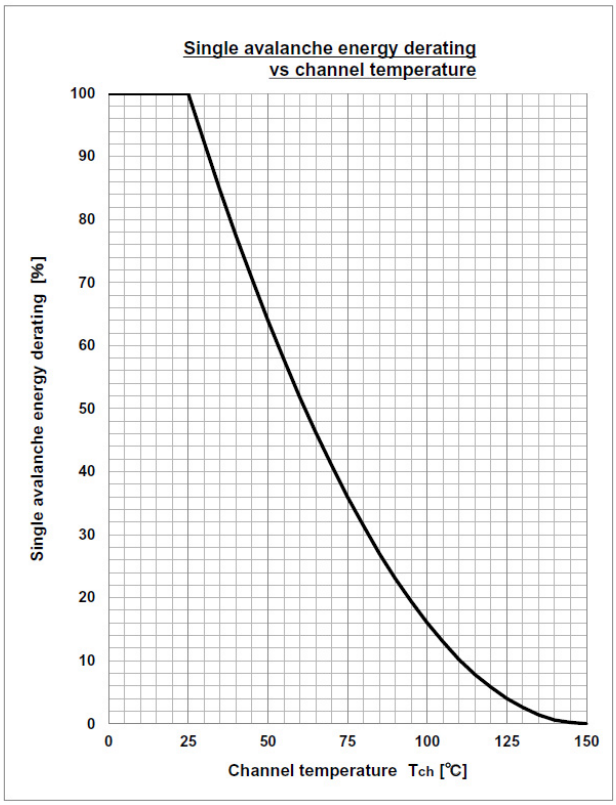


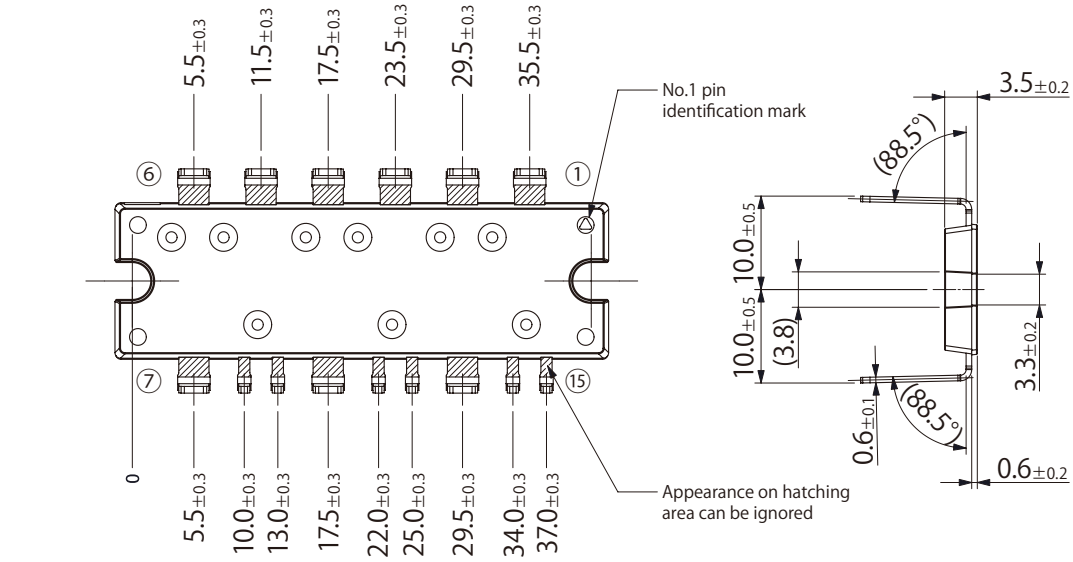


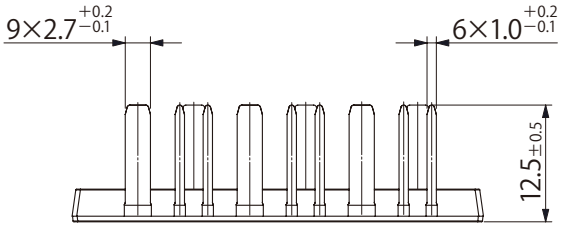
Package Outline-Dimensions

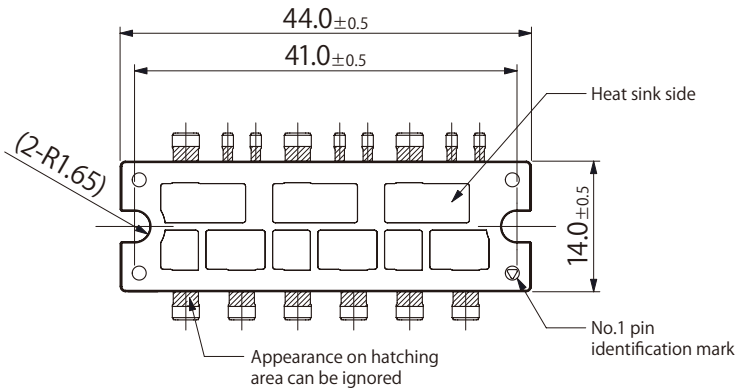
unit : mm

F5

JEDEC Code	–
JEITA Code	–
House Name	MG031







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