

MG031G148004A

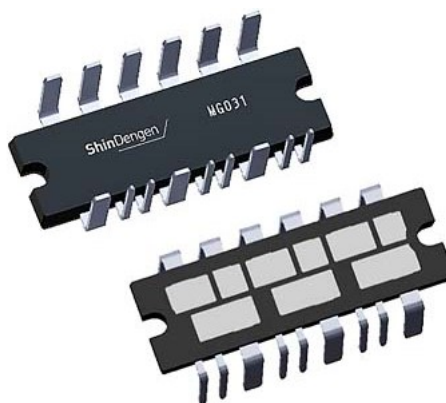
3 phase Inverter Module

Feature

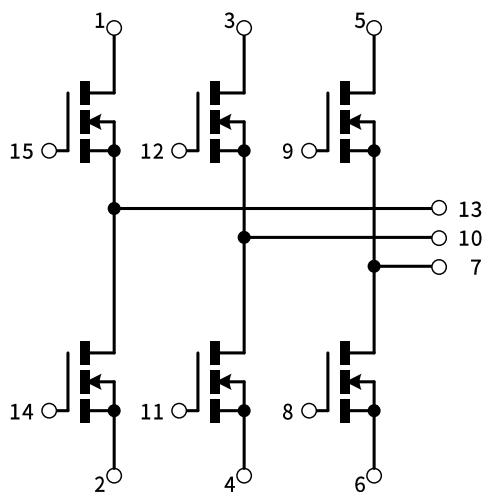
- 3 phase Inverter
- MOSFET(N-channel)
- High current capacity
- Low Ron
- Halogen free
- Pb free terminal
- RoHS:Yes

Outline

House Name: MG031



Equivalent circuit



Absolute maximum ratings (Tc = 25°C unless otherwise specified)

MOSFET

Item	Symbol	Conditions	Ratings	Unit
Channel temperature	T _{ch}		175	°C
Drain-source voltage	V _{DSS}		40	V
Gate-source voltage	V _{GSS}		±20	V
Continuous drain current (DC)	I _D		148	A
Continuous drain current (Peak)	I _{DP}	Pulse width 10μs, Duty = 1/100	592	A
Total power dissipation	P _T		154	W
Single avalanche current	I _{AS}	Starting T _{ch} =25°C T _{ch} ≤150°C	51	A

Module

Item	Symbol	Conditions	Ratings	Unit
Storage temperature	T _{stg}		-55~150	°C
Mounting torque	TOR	Fixing screw M3	0.8	N・m

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

These are characteristics of the 1 chip unless otherwise specified.

MOSFET

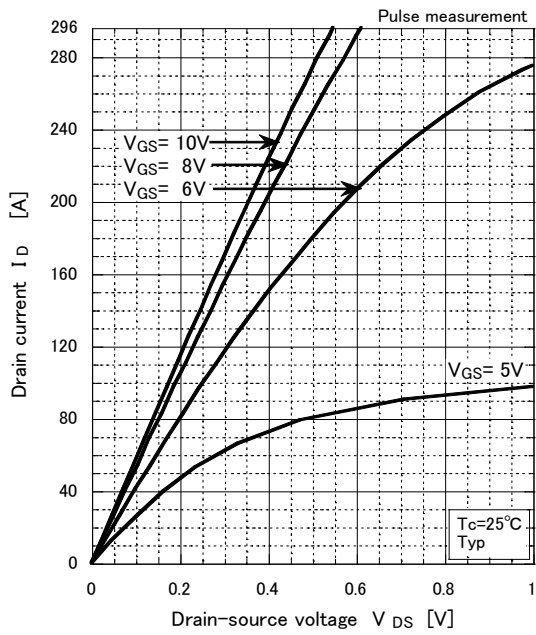
Item	Symbol	Conditions	Ratings			Unit
			Min.	Typ.	Max.	
Drain-source breakdown voltage	V _{(BR)DSS}	I _D =1mA, V _{GS} =0V	40	—	—	V
Zero gate voltage drain current	I _{DSS}	V _{DS} =40V, V _{GS} =0V	—	—	1.0	μA
Gate-source leakage current	I _{GSS}	V _{GS} =±20V, V _{DS} =0V	—	—	±0.1	μA
Static drain-source on-state resistance	R _{DS(ON)}	I _D =74A, V _{GS} =10V	—	1.75	2.20	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}	I _S =148A, V _{GS} =0V	—	—	1.5	V
Total gate charge	Q _g	V _{DD} =32V, V _{GS} =10V, I _D =148A	—	96	—	nC
Gate to source charge	Q _{gs}		—	27	—	
Gate to drain charge	Q _{gd}		—	33	—	
Input capacitance	C _{iss}	V _{DS} =25V, V _{GS} =0V, f=1MHz	—	5330	—	pF
Reverse transfer capacitance	C _{rss}		—	390	—	
Output capacitance	C _{oss}		—	833	—	

Turn-on delay time	td(on)	$I_D=74A, V_{DD}=20V, R_G=200\Omega,$ $V_{GS(+)}=10V, V_{GS(-)}=0V,$ $L=50\mu H$	—	590	—	ns
Rise time	tr		—	620	—	
Turn-off delay time	td(off)		—	2310	—	
Fall time	tf		—	510	—	
Source-drain diode reverse recovery time	trr	$I_F=148A, V_{GS}=0V, di/dt=100A/\mu s$	—	26	—	ns
Source-drain diode reverse recovery charge	Qrr		—	14	—	nC

Module

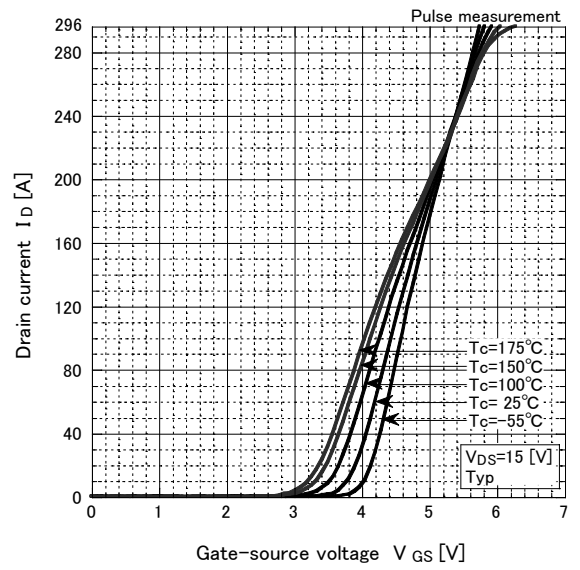
Item	Symbol	Conditions	Ratings			Unit
			Min.	Typ.	Max.	
Thermal resistance	$R_{th(j-c)}$	Junction to case	—	—	0.97	°C/W
	$R_{th(j-l)}$	Junction to lead	—	—	1.41	
		Junction to lead, With insulating sheet,Thickness 0.3mm, Thermal conductivity 3.9W/mK	—	—	2.16	

Typical output characteristics



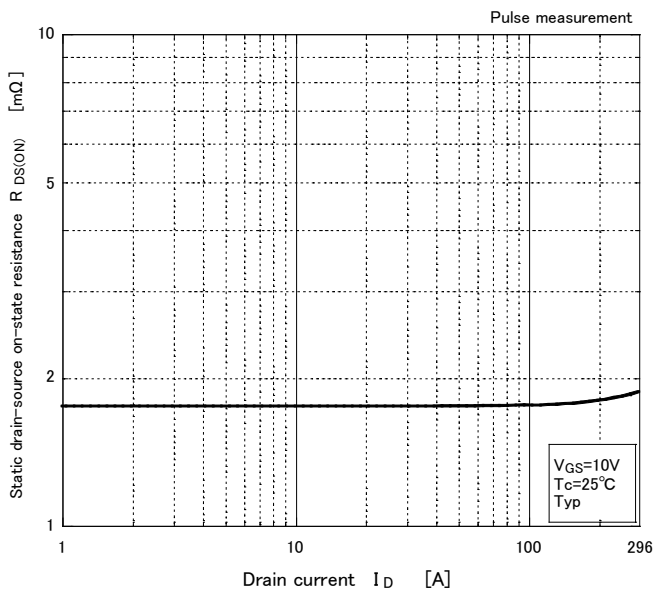
Note: The above characteristics curves are presented for reference only and not guaranteed by production test, unless otherwise noted.

Transfer characteristics



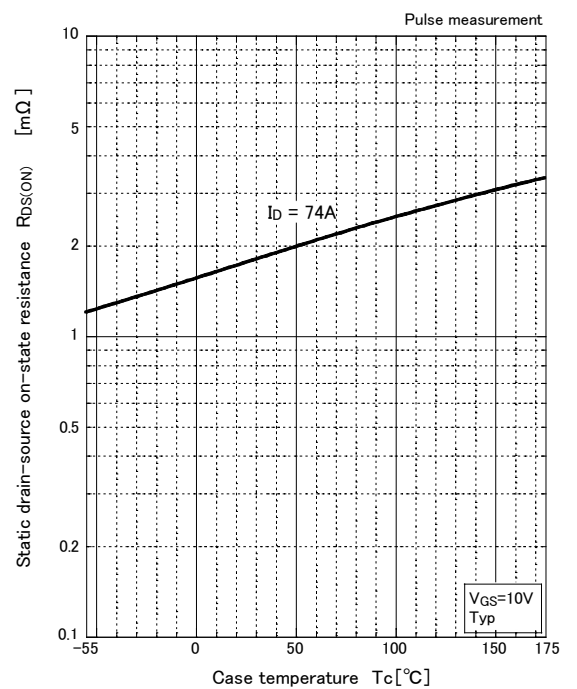
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Static drain-source on-state resistance vs drain current



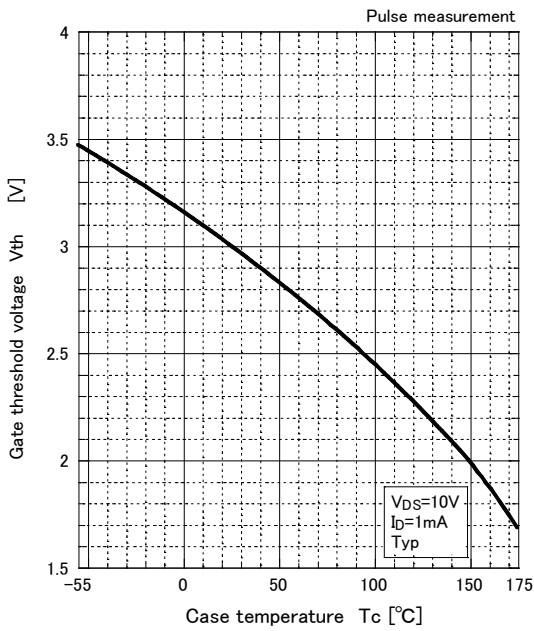
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Static drain-source on-state resistance vs case temperature



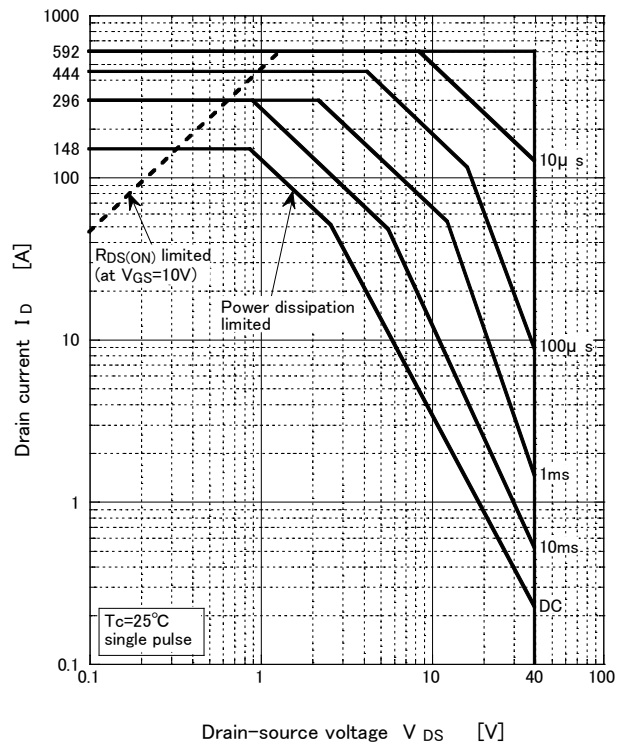
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Gate threshold voltage
vs case temperature

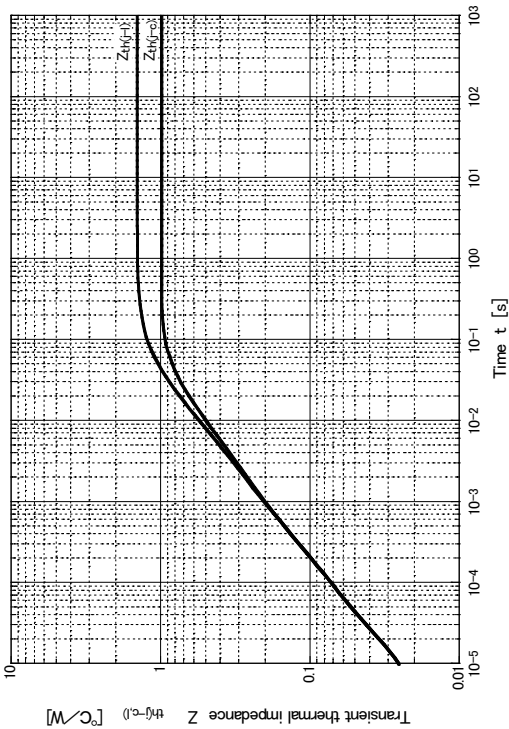


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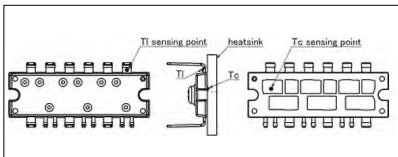
Safe operating area



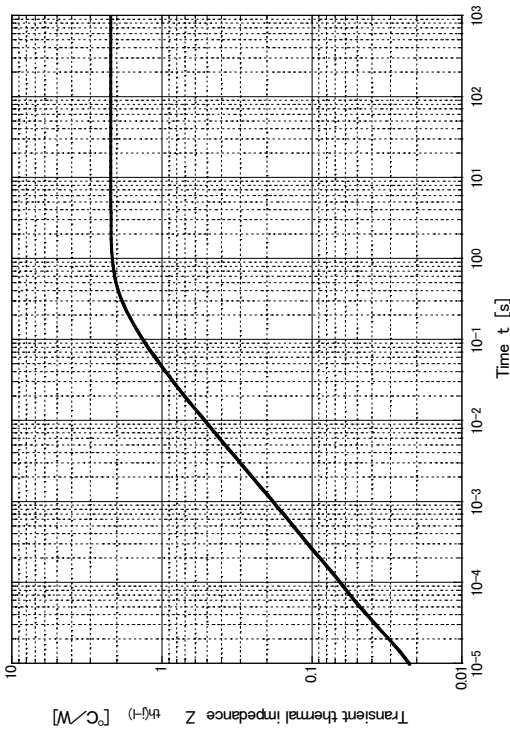
Transient thermal impedance



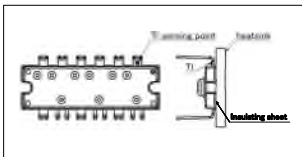
T_c, T_I sensing point



Transient thermal impedance



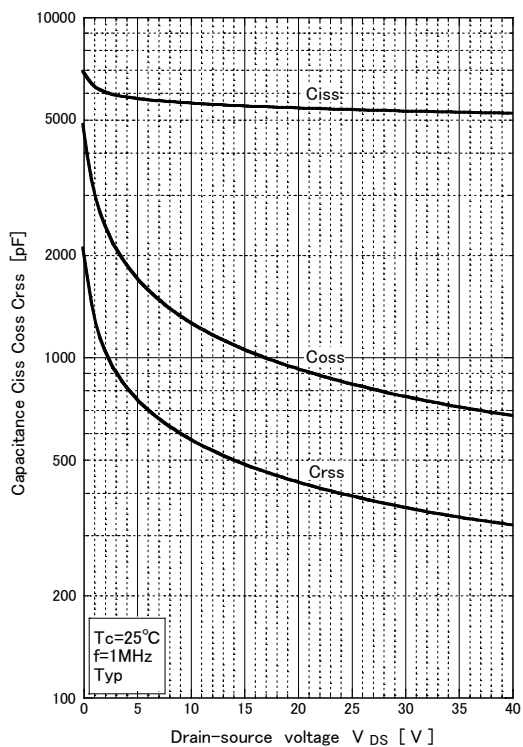
T_I sensing point



Insulating sheet detail

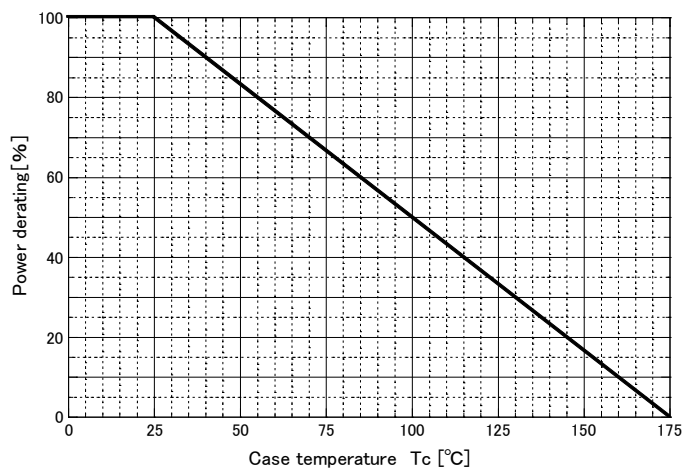
Thickness	0.3mm
Thermal conductivity	3.9W/mK

Capacitance characteristics

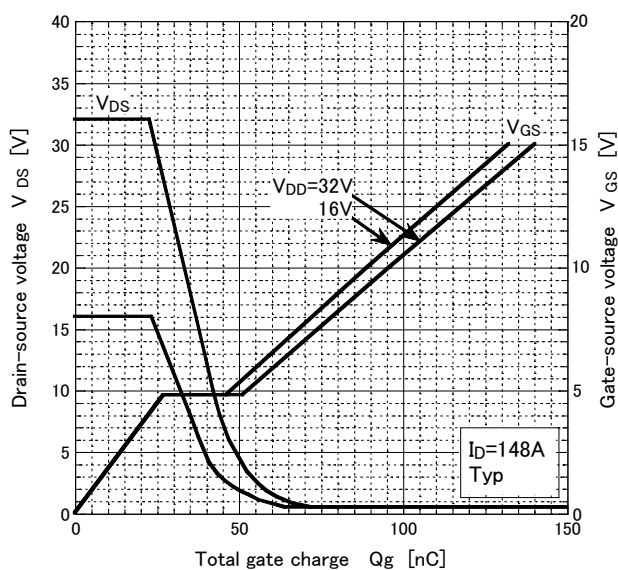


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Power derating - case temperature

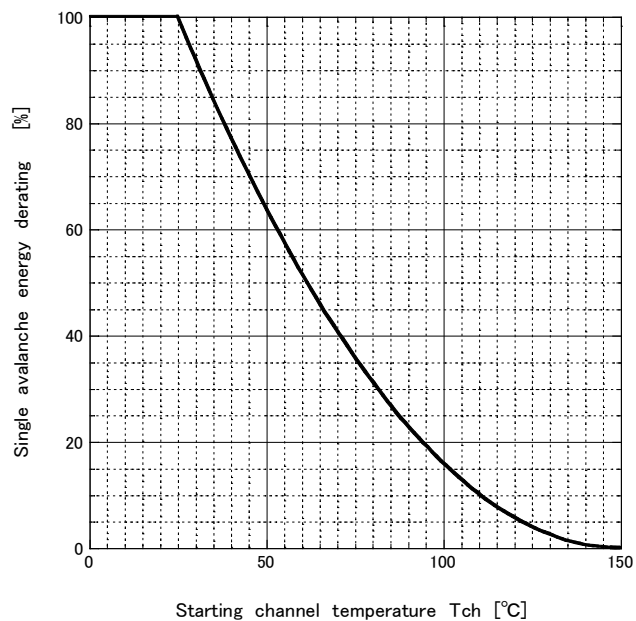


Gate Charge Characteristics



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Single avalanche energy derating vs channel temperature

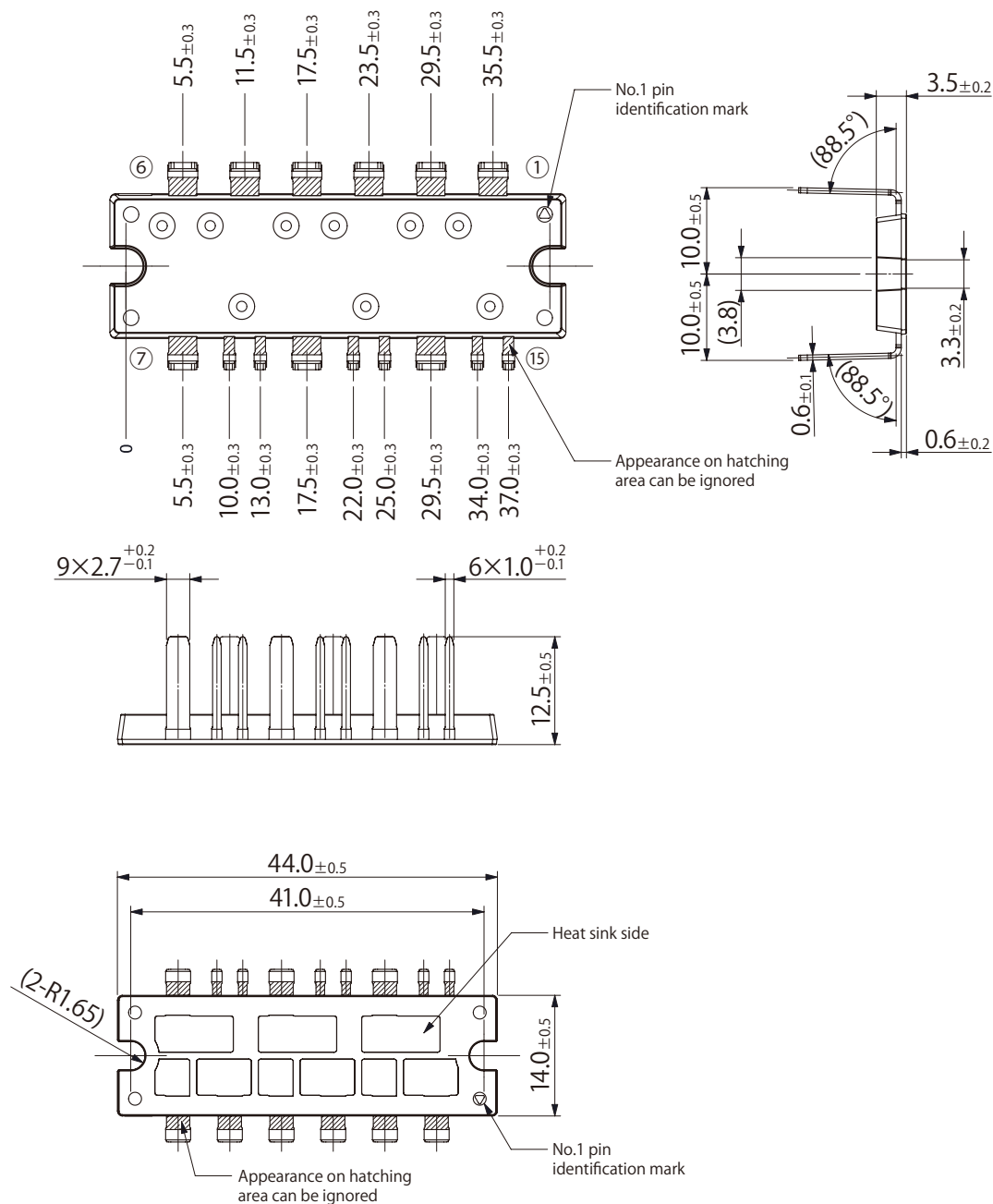


Package Outline-Dimensions

unit : mm

F5

JEDEC Code	—
JEITA Code	—
House Name	MG031



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