ShinDengen

MG031B090004A

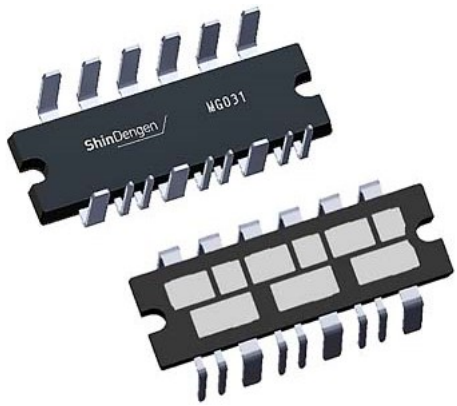
3 phase Inverter Module

Feature

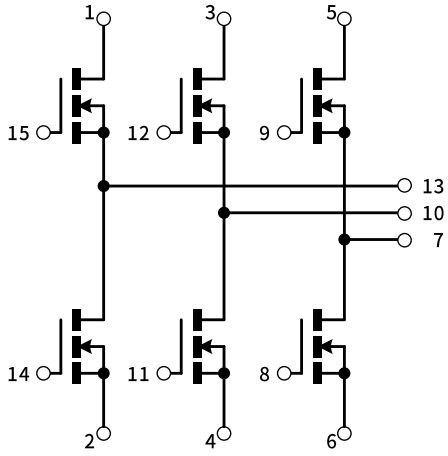
- 3 phase Inverter
- MOSFET(N-channel)
- High current capacity
- Low Ron
- Halogen free
- Pb free terminal
- RoHS:Yes

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}		40	V
Gate-source voltage	V_{GSS}		±20	
Continuous drain current (DC)	I_D		90	A
Continuous drain current (Peak)	I_{DP}	Pulse width 10μs, Duty = 1/100	360	
Total power dissipation	P_T		125	W
Single avalanche current	I_{AS}	Starting Tch=25°C Tch≦150°C	40	A

Module

Item	Symbol	Conditions	Ratings	Unit
Storage temperature	Tstg		-40～125	℃
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

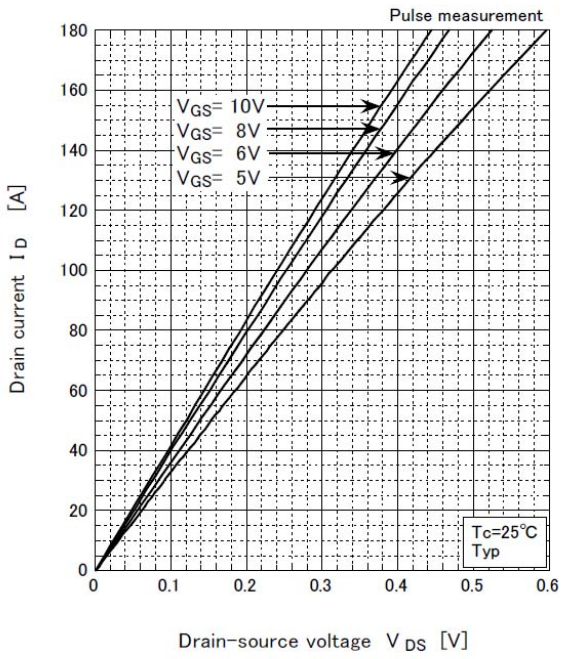
Item	Symbol	Conditions		Ratings			Unit
				Min.	Typ.	Max.	
Drain-source breakdown voltage	$V_{(BR)DSS}$	I_D=1mA, V_{GS}=0V		40	—	—	V
Zero gate voltage drain current	I_{DSS}	V_{DS}=40V, V_{GS}=0V		—	—	1.0	μA
Gate-source leakage current	I_{GSS}	V_{GS}=±20V, V_{DS}=0V		—	—	±0.1	
Static drain-source on-state resistance	$R_{DS(ON)}$	I_D=45A, V_{GS}=10V	Terminal	—	2.34	3.20	mΩ
		I_D=45A, V_{GS}=4.5V	Terminal	—	3.80	4.50	
Gate threshold voltage	V_{TH}	I_D=1mA, V_{DS}=10V		1.5	2.0	2.5	V
Source-drain diode forward voltage	V_{SD}	Is=90A, V_{GS}=0V		—	—	1.5	
Total gate charge	Qg	V_{DD}=32V, V_{GS}=10V, I_D=90A		—	76	—	nC
Gate to source charge	Qgs			—	16	—	
Gate to drain charge	Qgd			—	24	—	
Input capacitance	Ciss	V_{DS}=25V, V_{GS}=0V, f=1MHz		—	4180	—	pF
Reverse transfer capacitance	Crss			—	256	—	
Output capacitance	Coss			—	520	—	
Turn-on delay time	td(on)	ID=45A, VDD=20V, RG=200Ω, VGS(+)=10V, VGS(-)=0V, L=100μH		—	270	—	ns
Rise time	tr			—	320	—	
Turn-off delay time	td(off)			—	2730	—	
Fall time	tf			—	380	—	
Source-drain diode reverse recovery time	trr	IF=90A, VGS=0V, di/dt=100A/μs		—	39	—	ns
Source-drain diode reverse recovery charge	Qrr			—	30	—	nC

Module

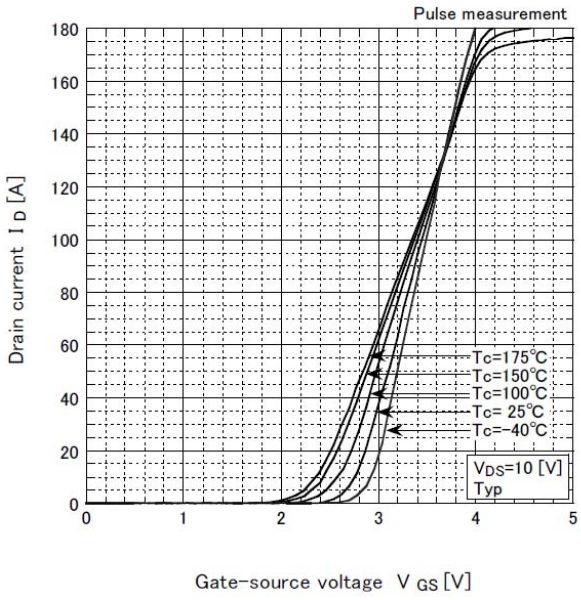
Item	Symbol	Conditions	Ratings			Unit
			Min.	Typ.	Max.	
Thermal resistance	$R_{th(j-c)}$	Junction to case, With heatsink	—	—	1.2	°C/W
	$R_{th(j-l)}$	Junction to lead, With heatsink	—	—	1.7	
		Junction to lead, With heatsink With insulating sheet,Thickness 0.3mm, 1.4W/mK	—	—	3.4	

CHARACTERISTIC DIAGRAMS

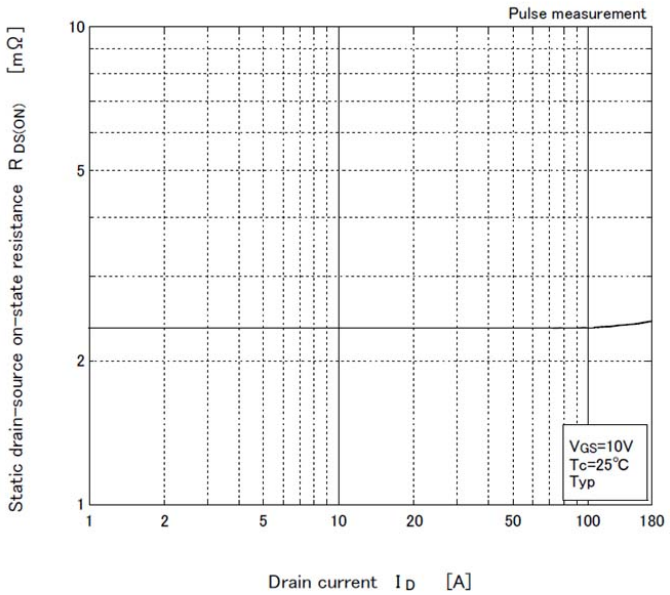
Typical output characteristics



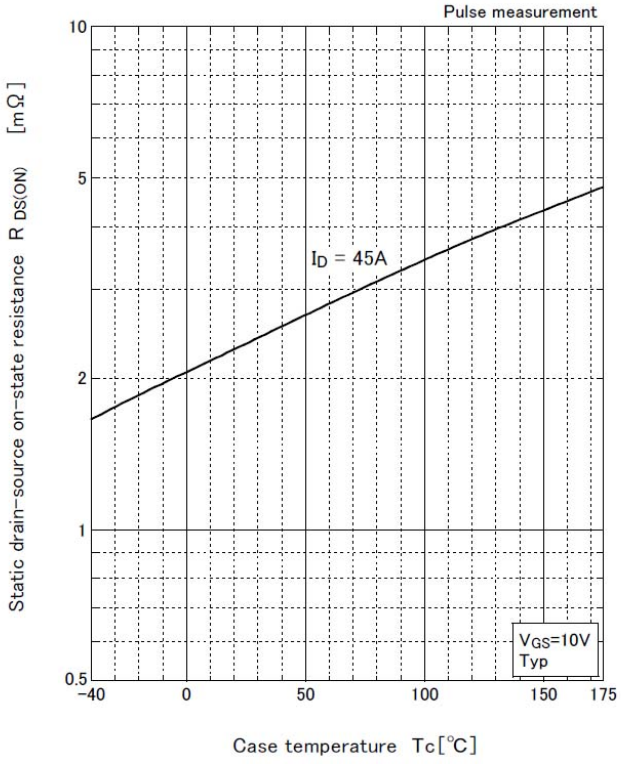
Transfer characteristics



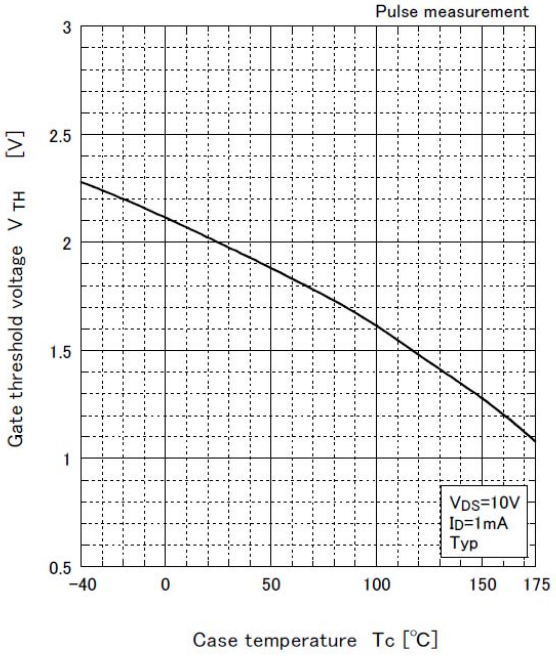
Static drain-source on-state resistance vs drain current



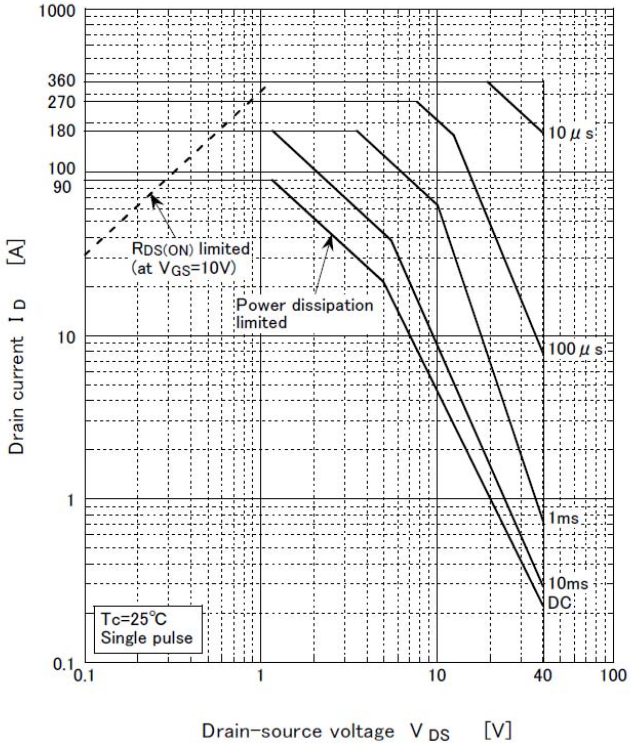
Static drain-source on-state resistance vs case temperature

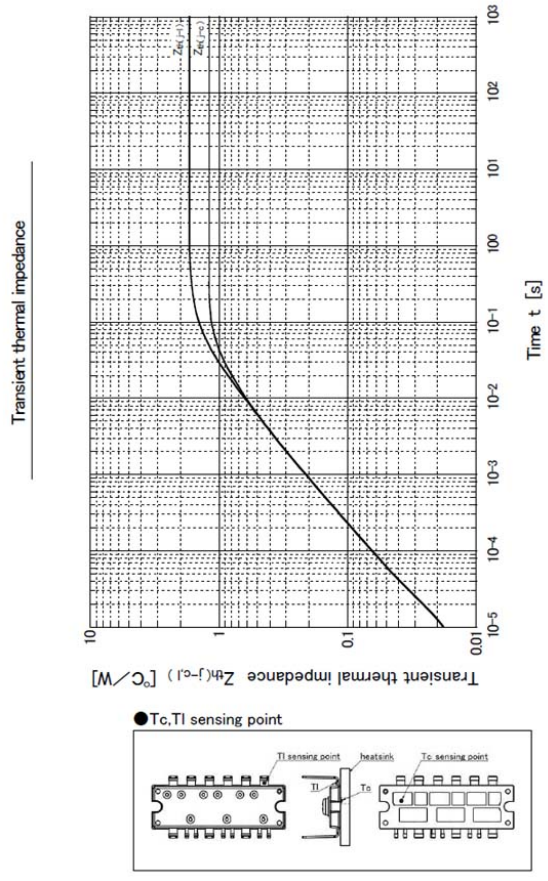


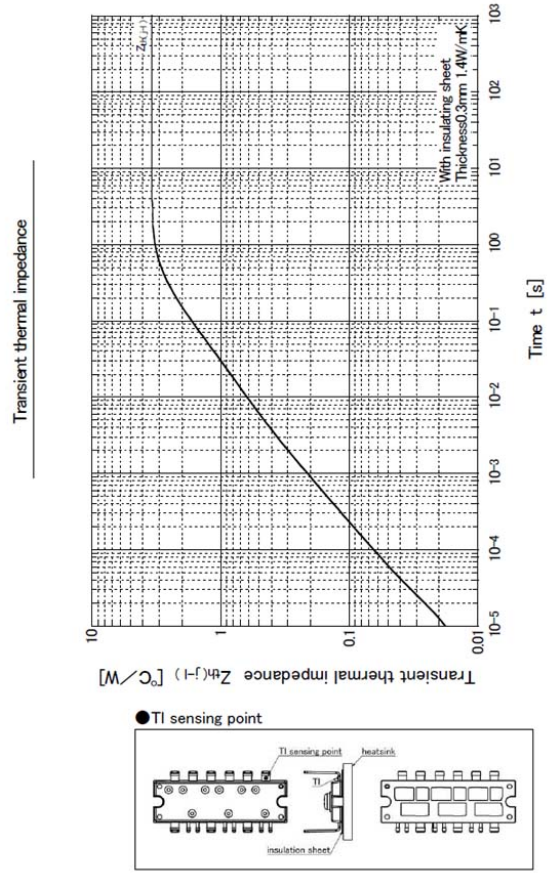
Gate threshold voltage
vs case temperature



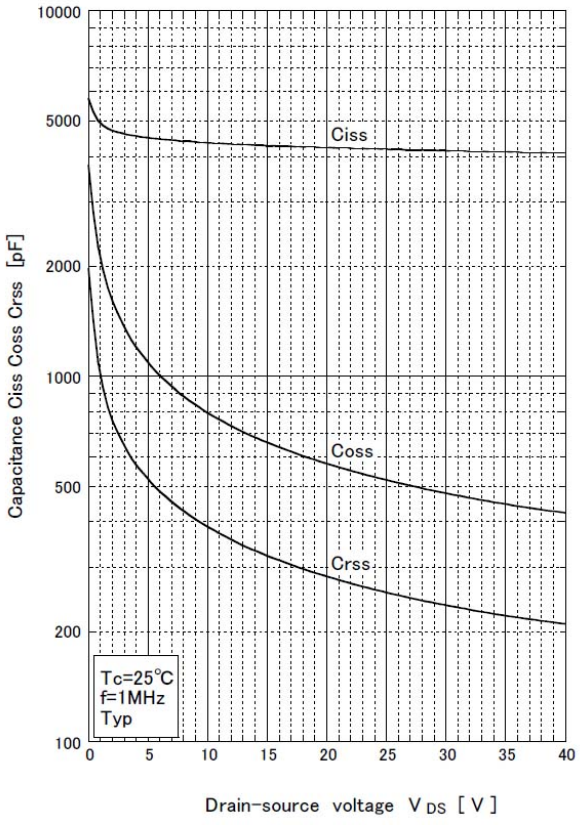
Safe operating area



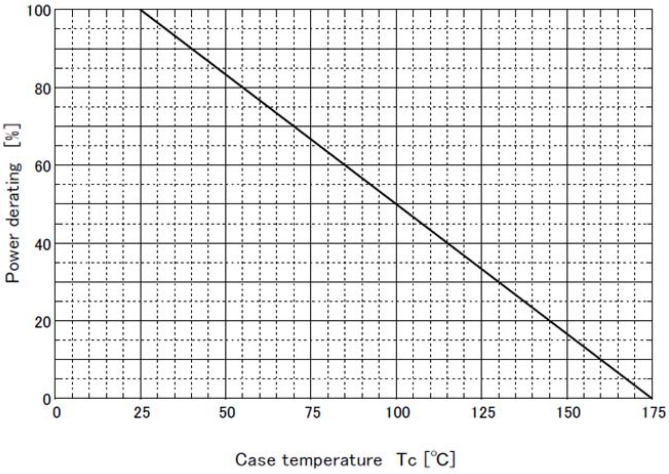




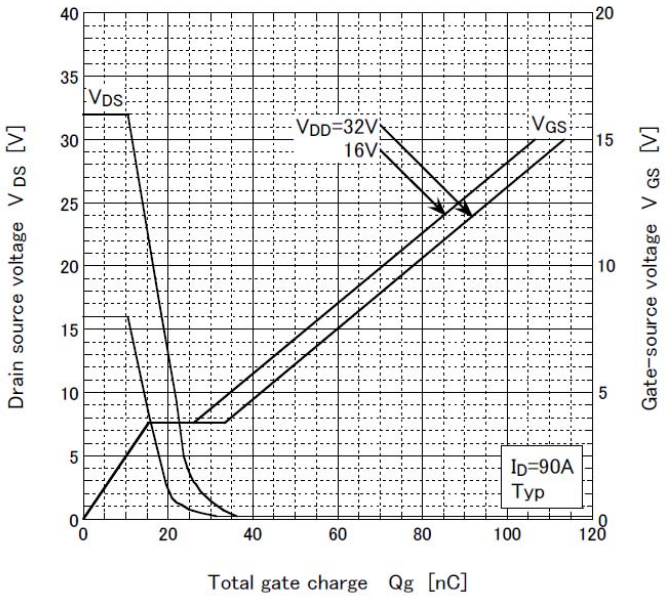
Capacitance characteristics



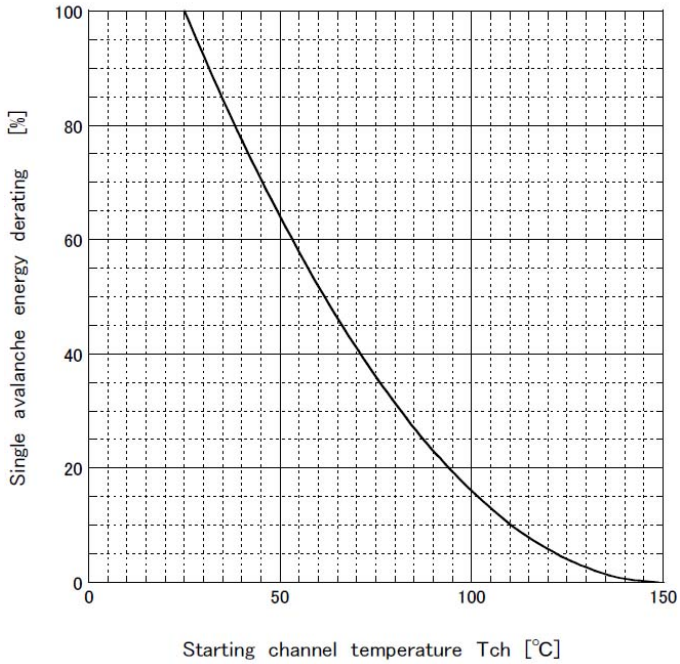
Power derating – case temperature



Gate charge characteristics



Single avalanche energy derating
vs channel temperature

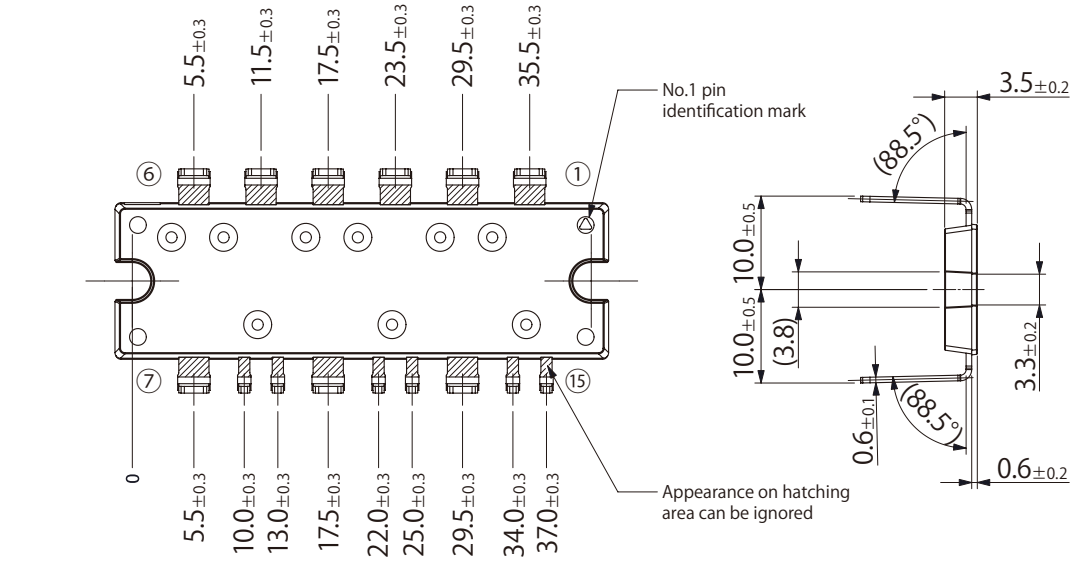


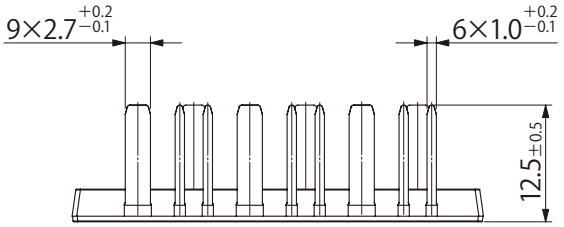
Package Outline-Dimensions

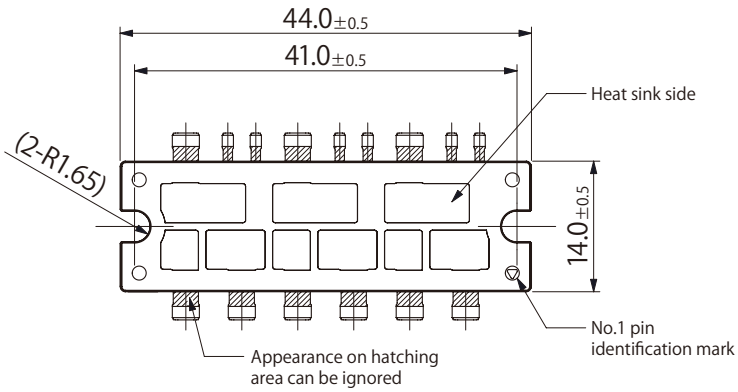
unit : mm

F5

JEDEC Code	–
JEITA Code	–
House Name	MG031







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