GOSTONE

RoHS COMPLIANT

GTD2303A

Dual N-channel Power MOSFET:
23V, 3.2mohm, 23.6A

Product Summary

VSSS	VGSS	RSS(ON) TYP/MAX	IS MAX
23V	± 12V	2.45/3.2mΩ@VGS=4.5V 2.65/3.45mΩ@VGS=3.8V 3.0/4.5mΩ@VGS=3.1V 3.85/7.6mΩ@VGS=2.5V	23.6A

Features

❖CSP (Chip Size Package)
❖Halogen-Free / RoHS Compliant
❖2.5V Drive Low Source-Source On-State Resistance
❖Gate Resistor Installed Common-Drain Type MOSFET
❖ESD Protection Diode Installed (Gate-Source)

Application

❖ Lithim-Ion Secondary Battery Protection Circuits

Marking Symbol Code

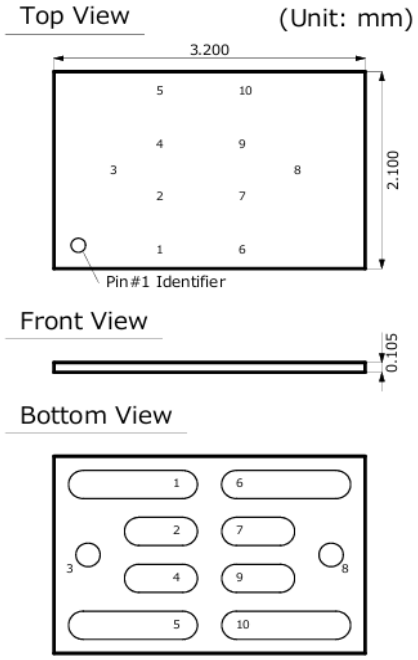
❖ Laser Marking Device Code: M

GS : Gostone (fixed)
M : Marking Device Code (fixed)
G : Factory Code
Y : Year Code
W : Week Code
L : LOT Code
● : Pin#1 Identifier

Form

❖ Tape & Reel Embossed Type: 5,000pcs / reel

Pin Assignment

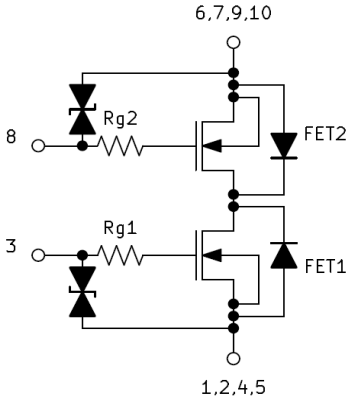


FET1: 1,2,4,5: Source1, 3: Gate1
FET2: 6,7,9,10: Source2, 8: Gate2

Absolute Maximum Rating (Ta=25°C)

Parameter		Symbol	Rating	Unit
Source to Source Voltage		VSS	23.0	V
Gate to Source Voltage		VGS	±12.0	V
Source Current	DC	IS1 *1	12.2	A
	DC	IS2 *2	23.6	A
	Pulse	ISP *2*3	95.0	A
Total Dissipation	DC	PD1 *1	0.47	W
	DC	PD2 *2	1.78	W
Junction Temperature		Tj	150	℃
Storage Temperature		Tstg	-55 to +150	℃

Equivalent circuit



Thermal Characteristic (Ta=25°C)

Parameter	Symbol	Rating	Unit
Thermal Resistance	Rth *1	262	℃/W
	Rth *2	70	℃/W

Note *1 Mounted on FR4 board (25.4mm x 25.4mm x t1.0mm)
with minimum copper pad (44.6mm2, 36μm thickness copper)
Note *2 Mounted on FR4 board (25.4mm x 25.4mm x t1.0mm)
with maximum copper pad (617.5mm2, 36μm thickness copper)
Note *3 t=10μs, duty cycle ≤ 1%

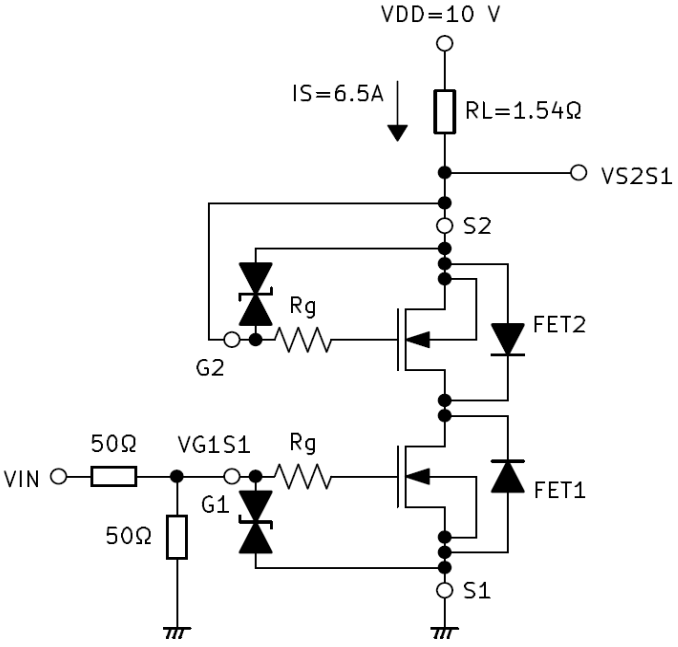
Electrical characteristics (Ta=25°C ± 3°C)

Parameter	Symbol	Conditions	Min	Typ	Max	Unit
Source-Source Breakdown Voltage	VSSS	IS=1mA, VGS=0V	23.0			V
Zero Gate Voltage Source Current	ISSS	VSS=23V, VGS=0V			1.0	μA
Gate-Source Leakage Current	IGSS1 IGSS2	VGS=±8V, VSS=0V VGS=±5V, VSS=0V			±10 ±1.0	μA
Gate-Source Threshold Voltage	Vth	VSS=6.0V, IS=1.0mA	0.4	0.9	1.4	V
Source-Source On-State Resistance	RSS(on)1 RSS(on)2 RSS(on)3 RSS(on)4	IS=6.5A, VGS=4.5V IS=6.5A, VGS=3.8V IS=6.5A, VGS=3.1V IS=6.5A, VGS=2.5V	1.8 1.9 2.1 2.3	2.5 2.7 3.0 3.9	3.2 3.5 4.5 7.6	mΩ
Body Diode Forward Voltage	VF(S-S)	IF=6.5A, VGS=0V		0.7	1.2	V
Input Capacitance *1 Output Capacitance *1 Reverse Transfer Capacitance *1	Ciss Coss Crss	VSS=10V, VGS=0V, f=1kHz		4,330 445 425		pF
Turn-On Delay Time *1 *2 Rise Time *1 *2	td(on) tr	VDD=10V, VGS=0 to 4.0V, IS=6.5A		0.9 2.4		μs
Turn-Off Delay Time *1 *2 Fall Time *1 *2	td(off) tf	VDD=10V, VGS=4.0 to 0V, IS=6.5A		6.7 4.2		μs
Total Gate Charge *1 Gate-Source Charge *1 Gate-Drain Charge *1	Qg Qgs Qgd	VDD=10V, VGS=0 to 4.0V, IS=13A		52.6 7.6 17.6		nC
Gate Resistance *1	Rg	f=1MHz		590		Ω

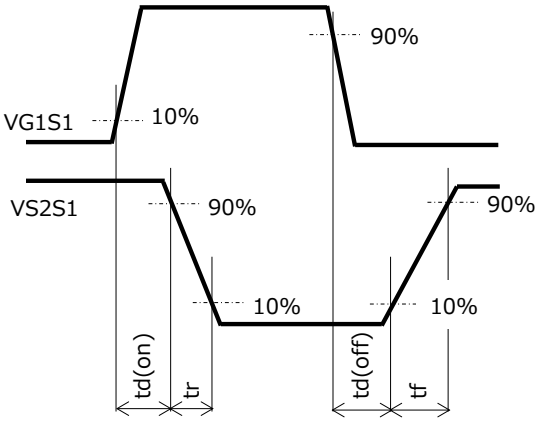
Note *1 Guaranteed by Design

Note *2 Measurement Circuit for Switching Characteristics

FET1 Measurement Circuit for Switching Characteristics td(on), tr, td(off), tf (FET2: Gate-Source Short)

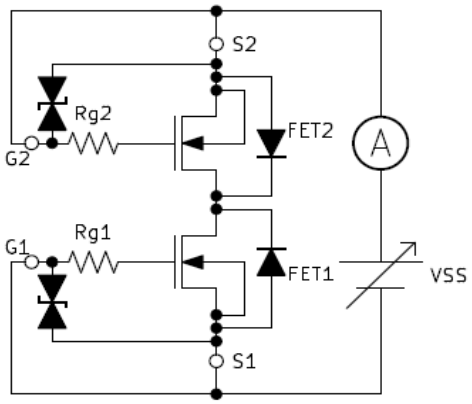


(Definition of Switching Measurement Detection)

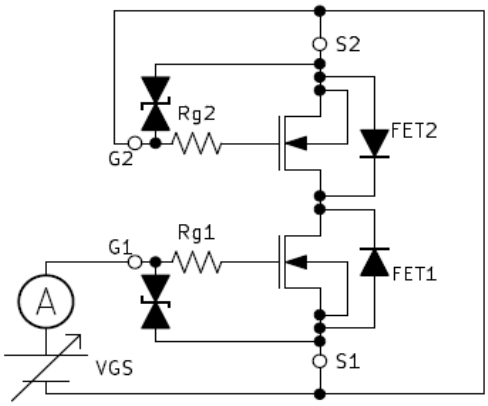


Test Circuit for FET1

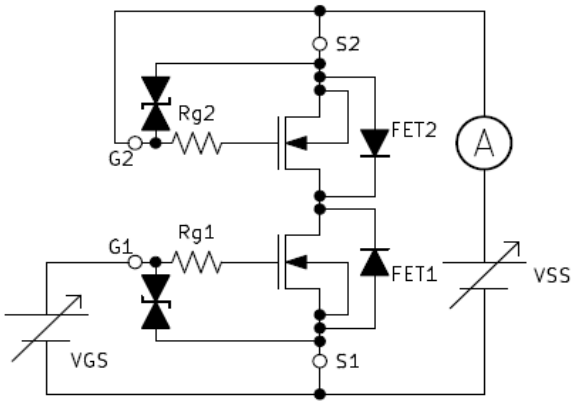
Test Circuit 1
VGSS/ISSS



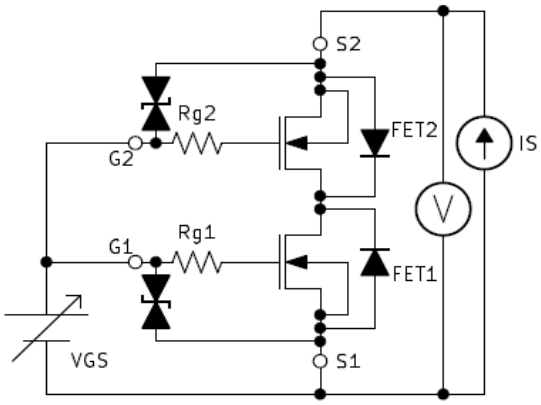
Test Circuit 2
IGSS/1/2



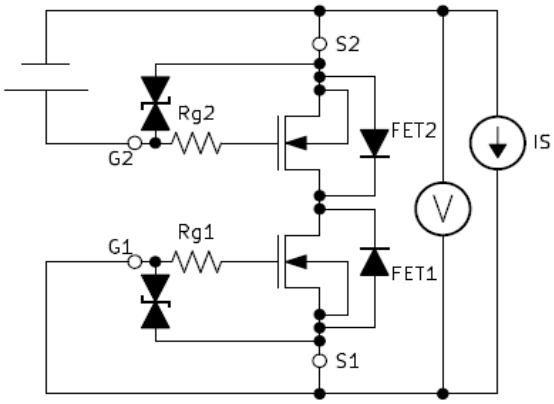
Test Circuit 3
Vth



Test Circuit 4
RSS(on)

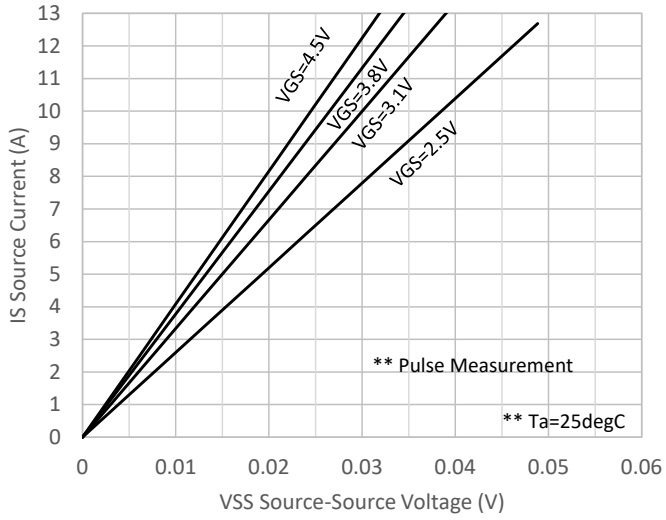


Test Circuit 5
VF(S-S)

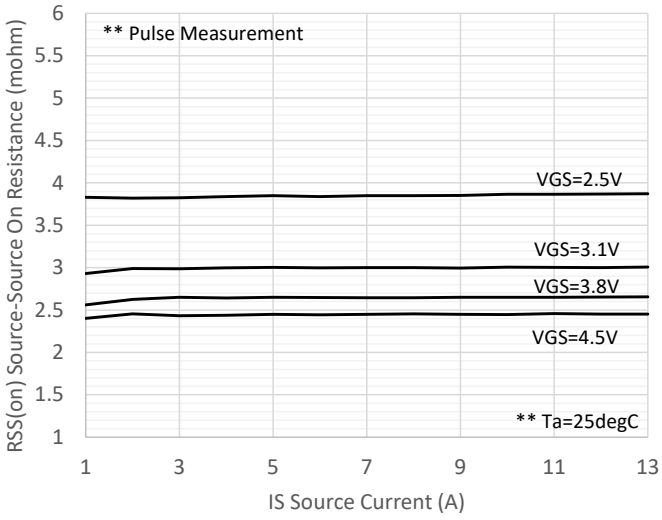


Technical data

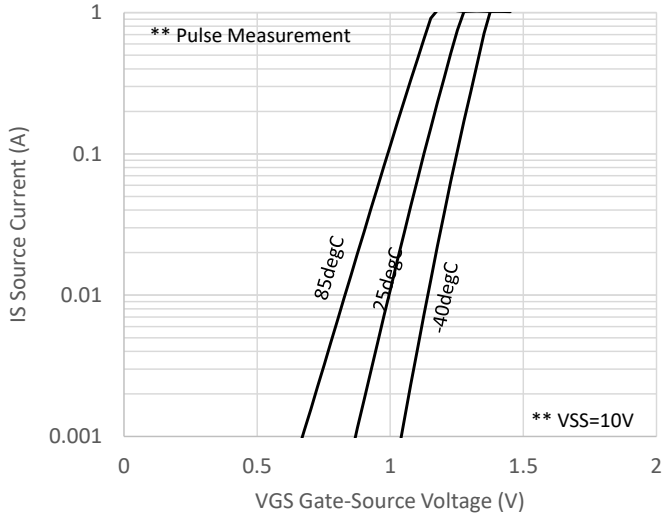
IS to VSS



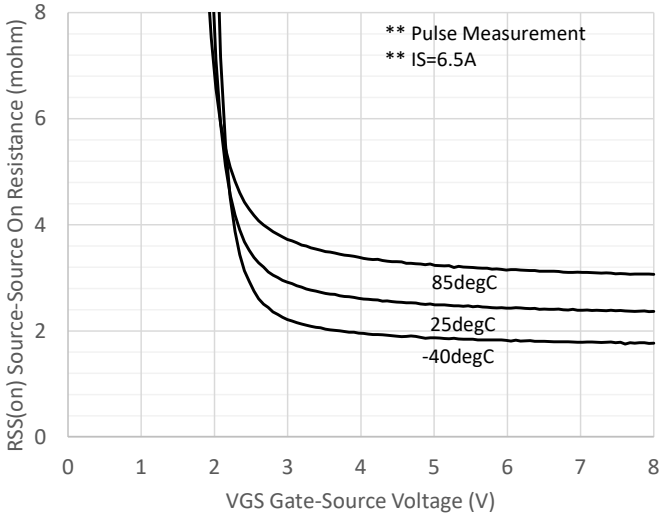
RSS(on) to IS



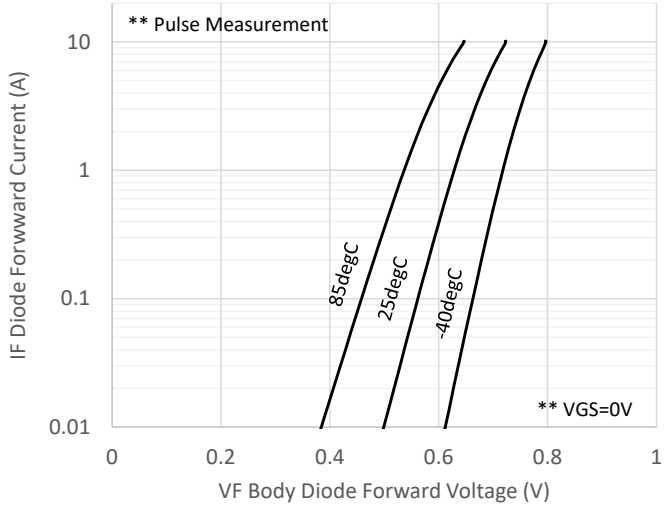
IS to VGS



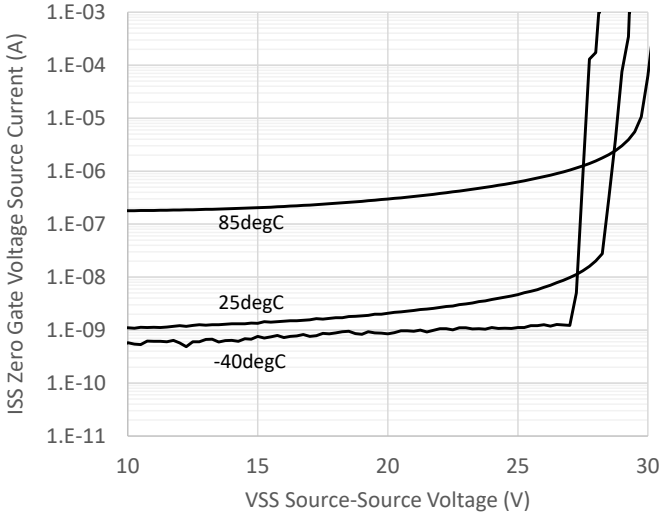
RSS(on) to VGS



IF to VF

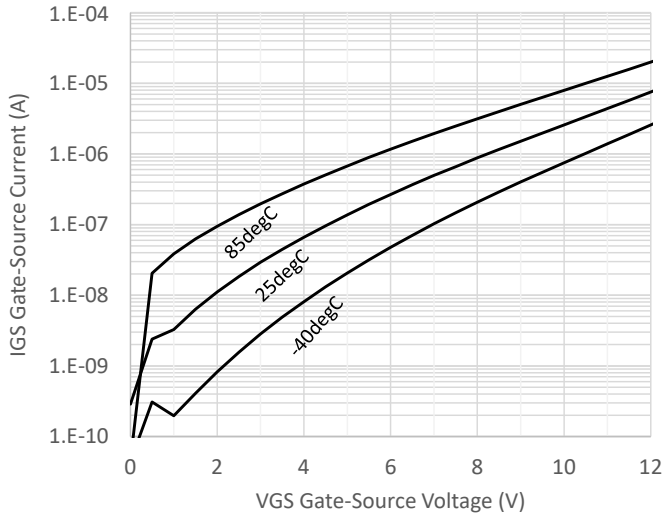


ISS to VSS

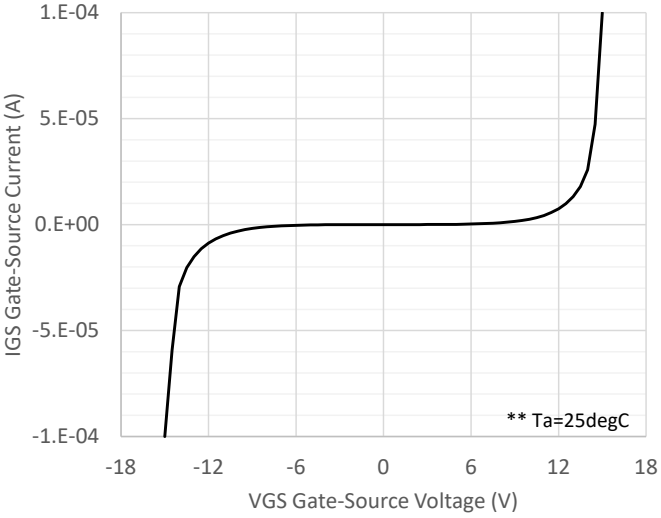


Technical data

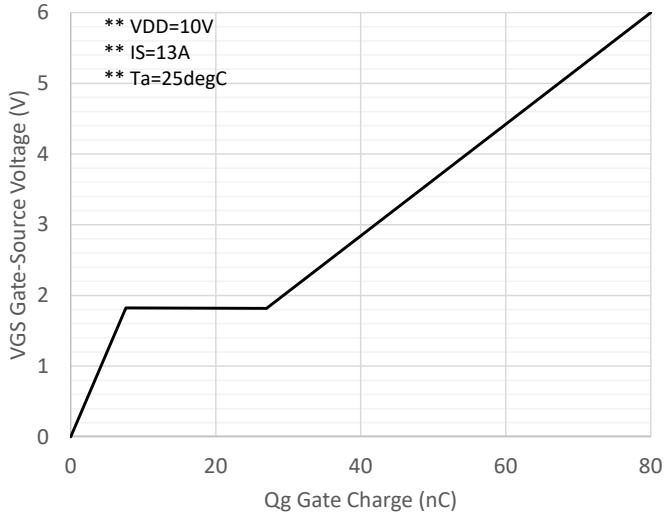
IGS to VGS



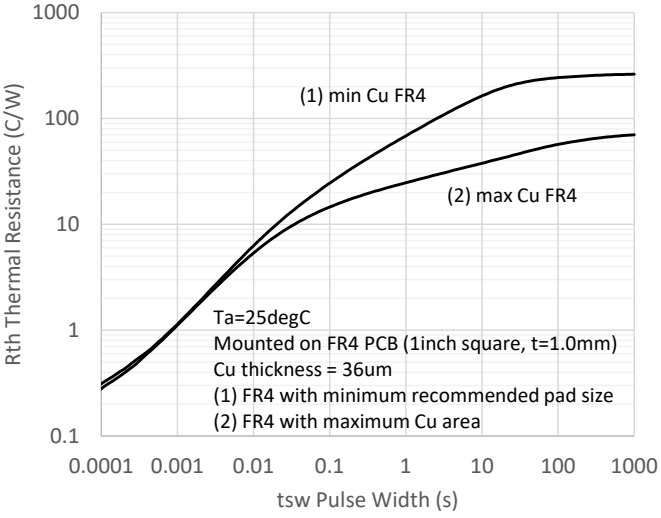
IGS to VGS



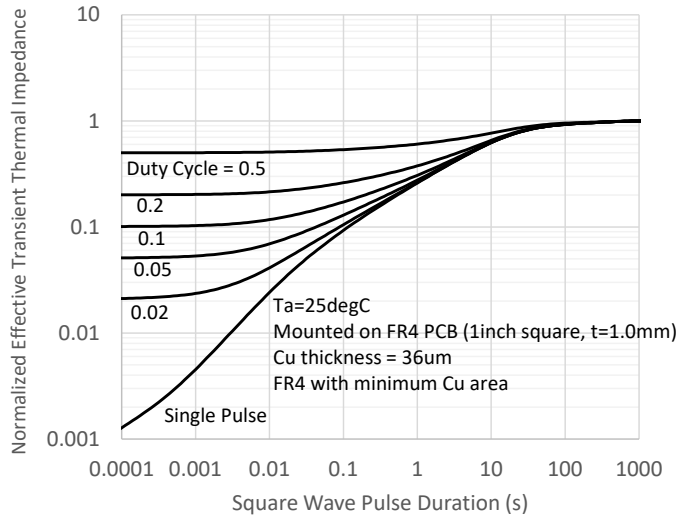
Dynamic Input / Output Characteristics



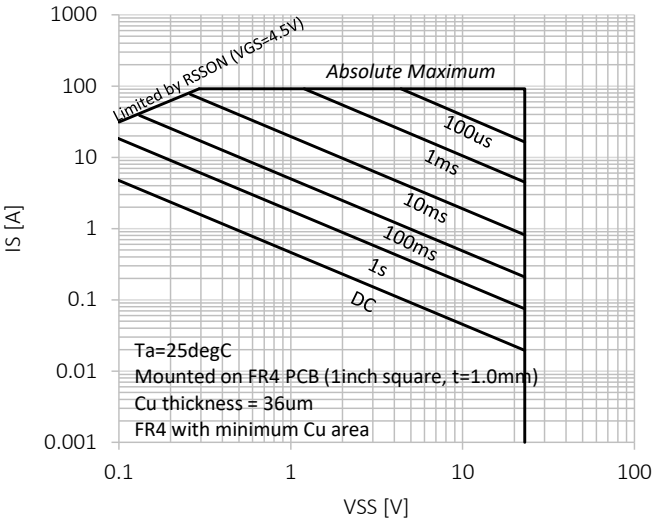
Rth to tsw



Thermal Respose



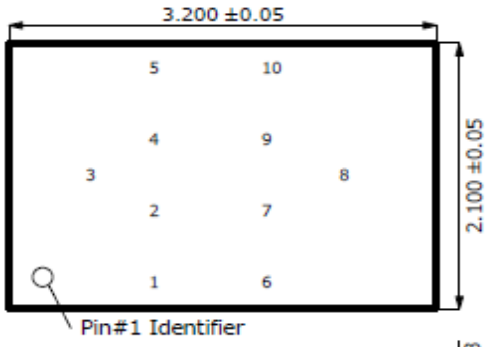
Safe Operating Area



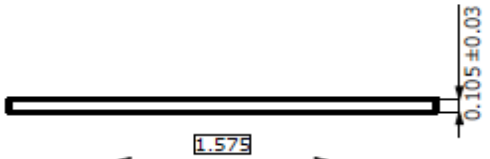
Package outline dimensions

(Unit: mm)

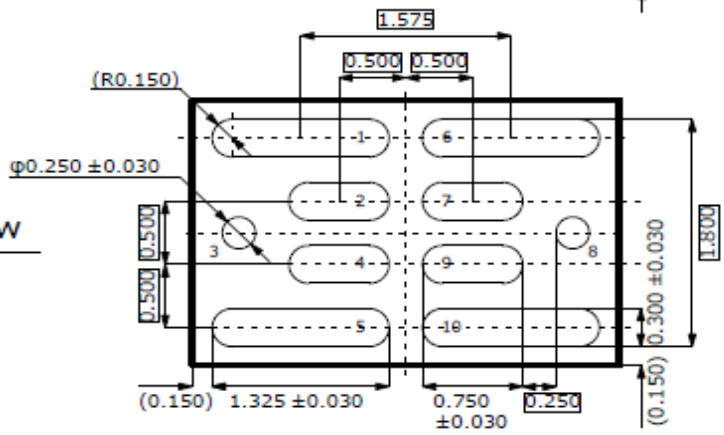
Top View



Front View

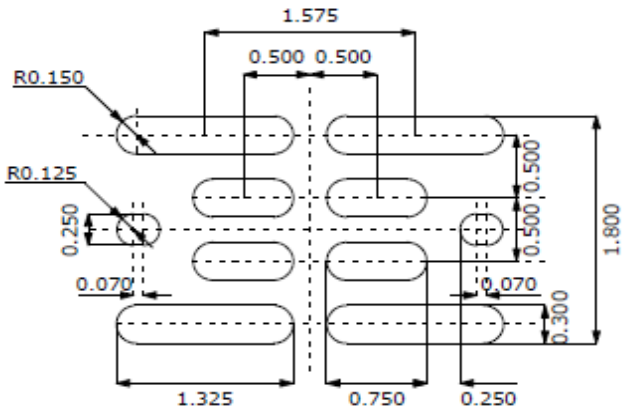


Bottom View



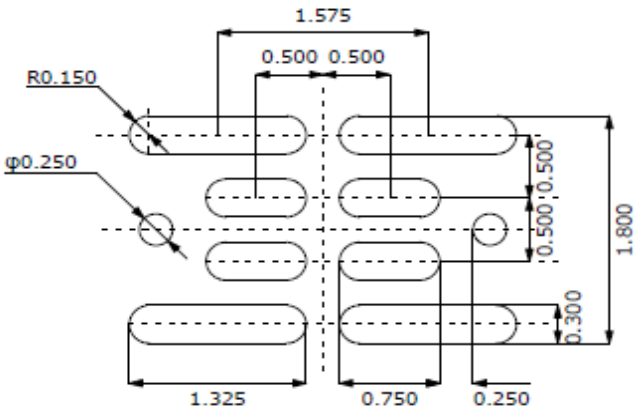
(Reference) Board Land Pattern

(Unit: mm)



(Reference) Stencil Mask Pattern

(Unit: mm)



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