GOSTONE

RoHS COMPLIANT

GTD1209A

Dual N-channel Power MOSFET:
12V, 0.85mohm, 40A

Product Summary			
VSSS	VGSS	RSS(ON) TYP/MAX	IS MAX
12V	± 8V	0.85/1.15 mΩ@VGS=4.5V 0.90/1.20 mΩ@VGS=3.8V 1.15/1.70 mΩ@VGS=3.1V 1.55/3.00 mΩ@VGS=2.5V	40A

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

- ❖ Lithium-Ion Secondary Battery Protection Circuits

Marking Symbol Code

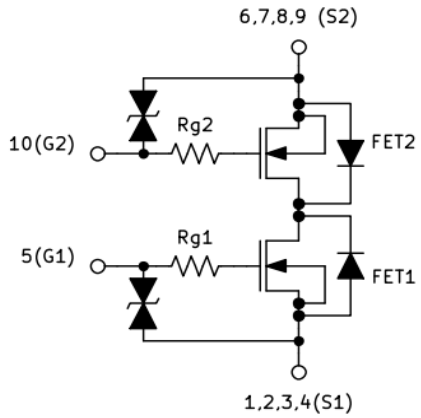
- ❖ Laser Marking Device Code: F

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

Form

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

Equivalent circuit

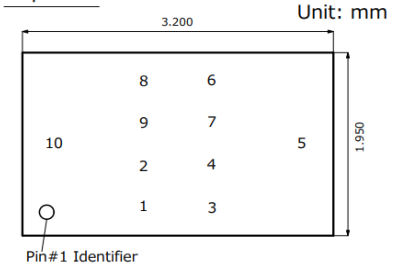


Absolute Maximum Rating Ta=25℃				
Parameter		Symbol	Rating	Unit
Source to Source Voltage		VSS	12	V
Gate to Source Voltage		VGS	±8	V
Source Current	DC	IS1 *1	20	A
	DC	IS2 *2	40	A
	Pulse	ISP *2*3	158	A
Total Dissipation	DC	PD1 *1	0.48	W
	DC	PD2 *2	1.92	W
Junction Temperature		Tj	150	℃
Storage Temperature		Tstg	-55 to +150	℃

Thermal Characteristics Ta = 25℃			
Parameter	Symbol	Rating	Unit
Thermal Resistance	Rth *1	258	℃/W
	Rth *2	65	℃/W

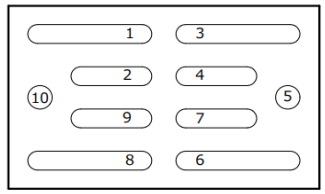
Note *1 Mounted on FR4 board (25.4mm x 25.4mm x t1.0mm)
with minimum copper pad (44.6mm2, 36μm thickness copper)
Note *2 Mounted on FR4 board (25.4mm x 25.4mm x t1.0mm)
with maximum copper pad (617.5mm2, 36μm thickness copper)
Note *3 t=10μs, duty cycle ≤ 1%

Top View



Front View

Bottom View



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

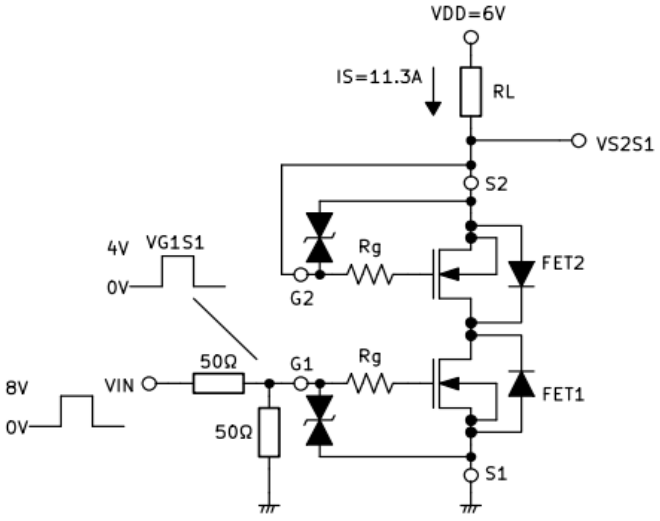
Electrical Characteristics (Ta=25degC +/- 3degC)

Parameter	Symbol	Conditions	Min	Typ	Max	Unit
Source-Source Breakdown Voltage	VSSS	IS=1mA, VGS=0V	12			V
Zero Gate Voltage Source Current	ISSS	VSS=12V, VGS=0V			1	μA
Gate-Source Leakage Current	IGSS1	VGS=±8V, VSS=0V			±10	μA
	IGSS2	VGS=±5V, VSS=0V			±1	μA
Gate-Source Threshold Voltage	Vth	VSS=6V, IS=1.0mA	0.35	0.90	1.40	V
Source-Source On-State Resistance	RSS(on)1	IS=11.3A, VGS=4.5V	0.60	0.85	1.15	mΩ
	RSS(on)2	IS=11.3A, VGS=3.8V	0.60	0.90	1.20	
	RSS(on)3	IS=11.3A, VGS=3.1V	0.70	1.15	1.70	
	RSS(on)4	IS=11.3A, VGS=2.5V	0.95	1.55	3.00	
Body Diode Forward Voltage	VF(S-S)	IF=11.3A, VGS=0V		0.7	1.0	V
Input Capacitance *1	Ciss	VSS=10V, VGS=0V, f=1kHz		4,850		pF
Output Capacitance *1	Coss			1,250		
Reverse Transfer Capacitance *1	Crss			1,237		
Turn-On Delay Time *1 *2	td(on)	VDD=6V, VGS=0 to 4.0V, IS=11.3A		1.4		μs
Rise Time *1 *2	tr			4.3		
Turn-Off Delay Time *1 *2	td(off)	VDD=6V, VGS=4.0 to 0V, IS=11.3A		4.9		μs
Fall Time *1 *2	tf			8.8		
Total Gate Charge *1	Qg	VDD=6V, VGS=0 to 4.0V, IS=20A		66		nC
Gate-Source Charge *1	Qgs			8		
Gate-Drain Charge *1	Qgd			27		
Gate Resistance *1	Rg	f=1MHz		830		Ω

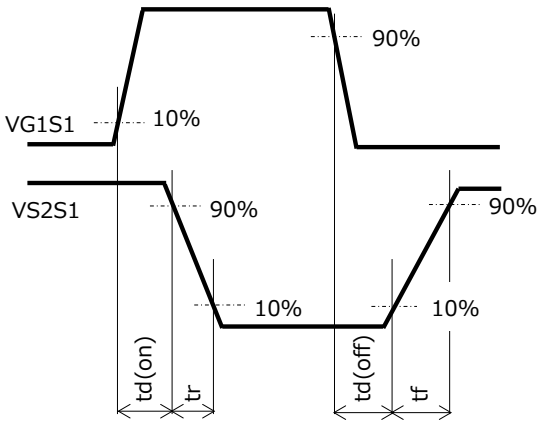
Note *1 Guaranteed by Design

Note *2 Measurement Circuit for Switching Characteristics

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

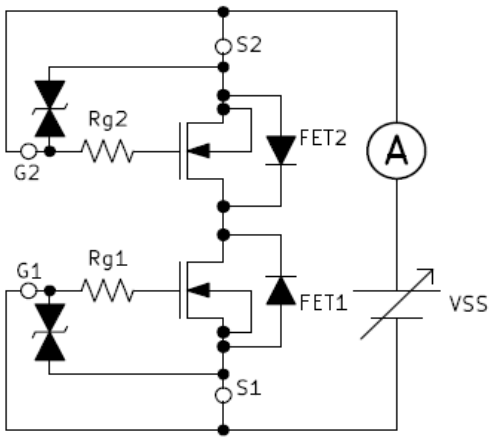


(Definition of Switching Measurement Detection)

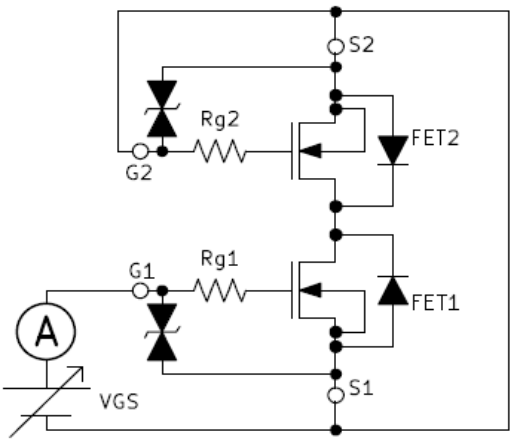


Test circuits for FET1

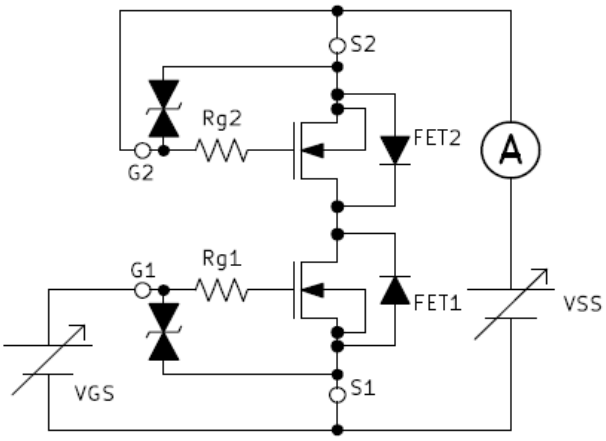
Test Circuit 1
VSSS/ISSS



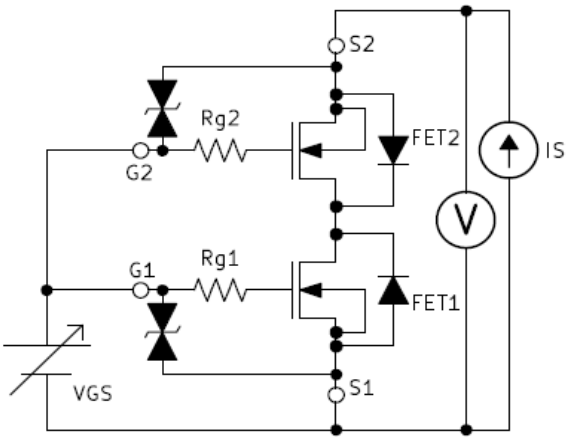
Test Circuit 2
IGSS1/2



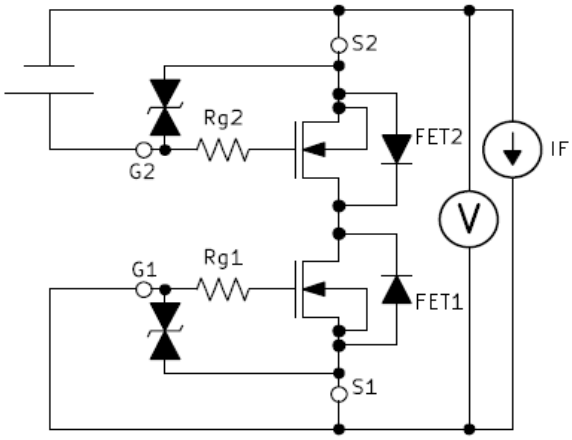
Test Circuit 3
Vth



Test Circuit 4
RSS(on)

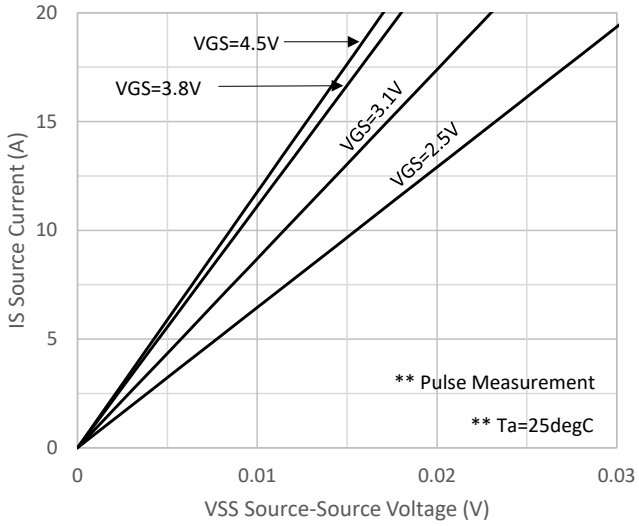


Test Circuit 5
VF(S-S)

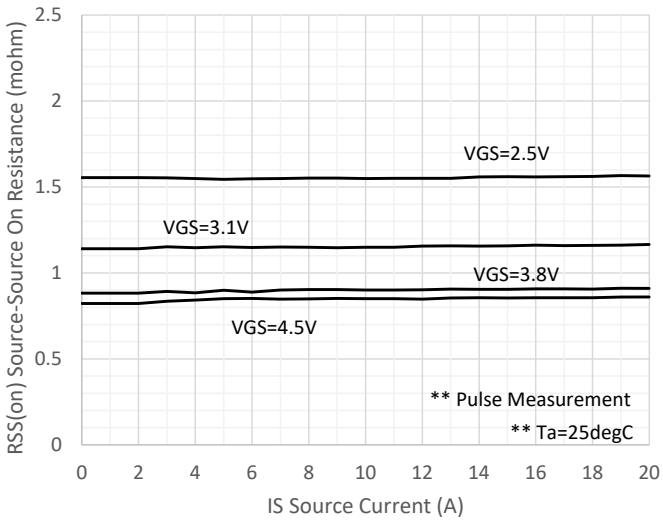


Technical data

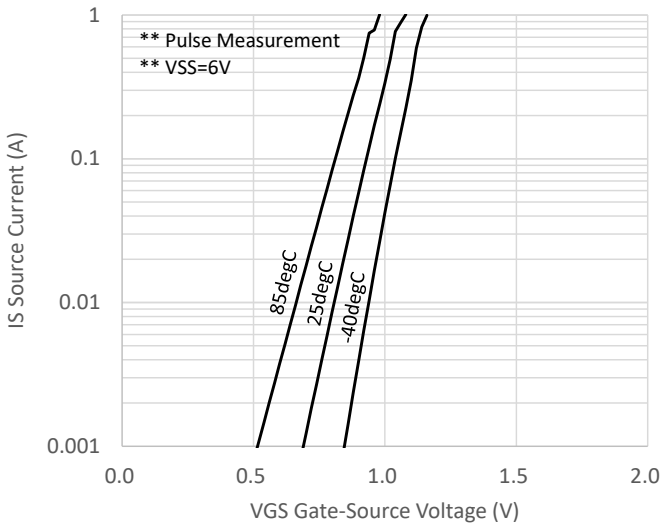
IS to VSS



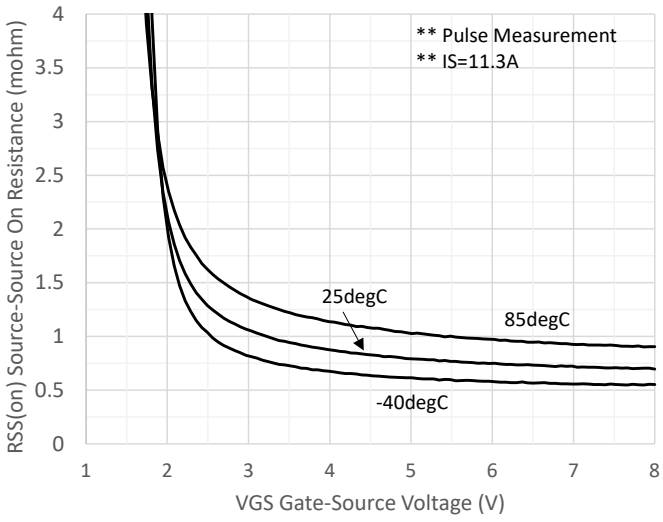
RSS(on) to IS



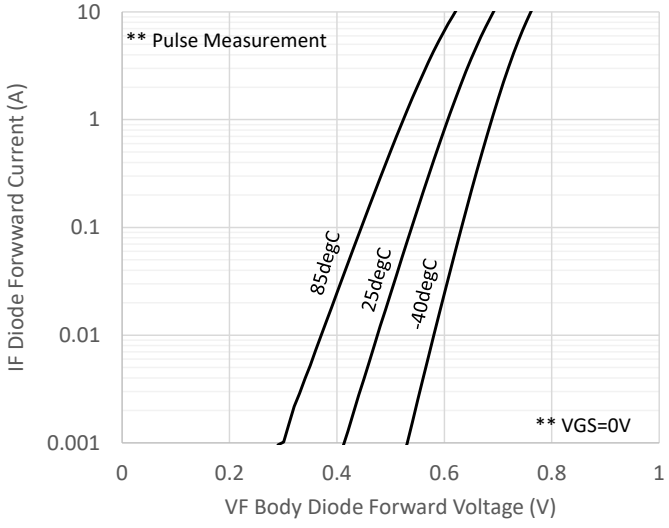
IS to VGS



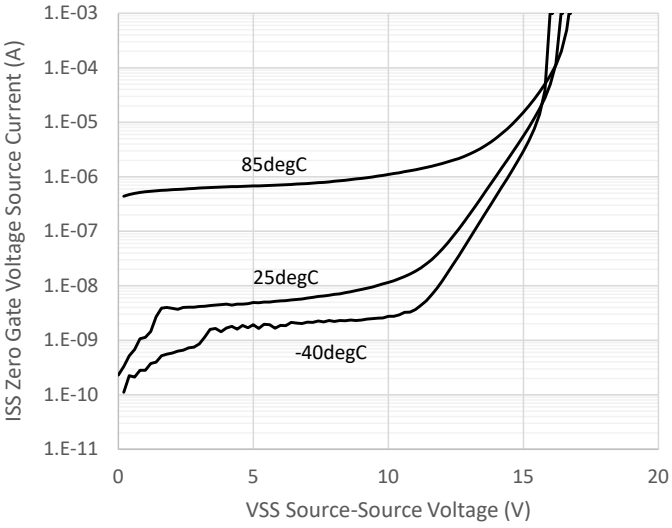
RSS(on) to VGS



IF to VF

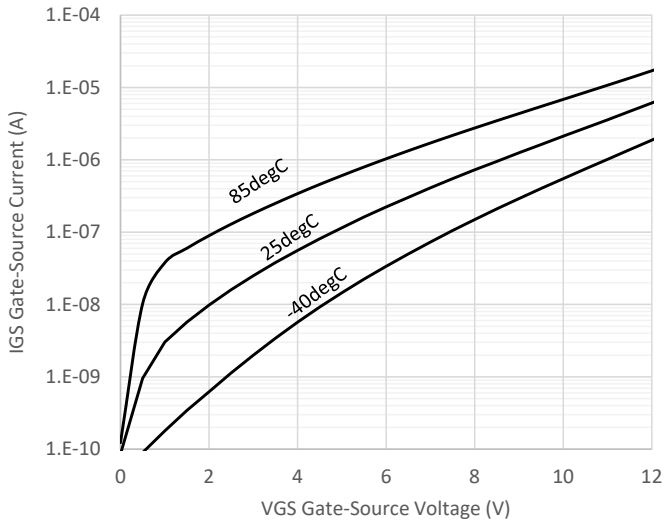


ISS to VSS

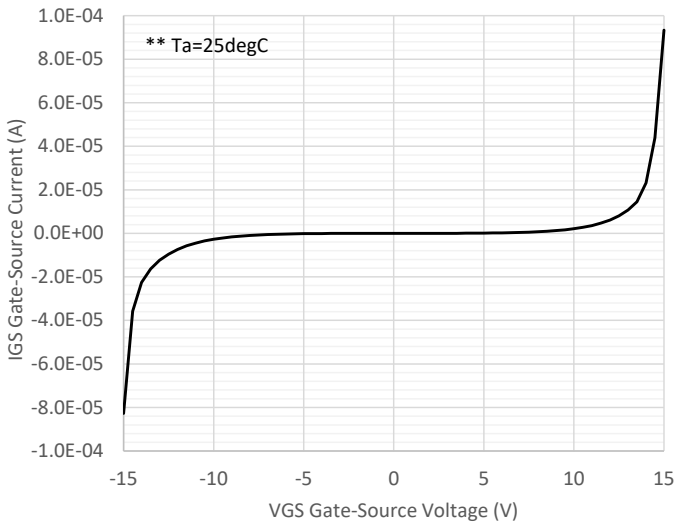


Technical data

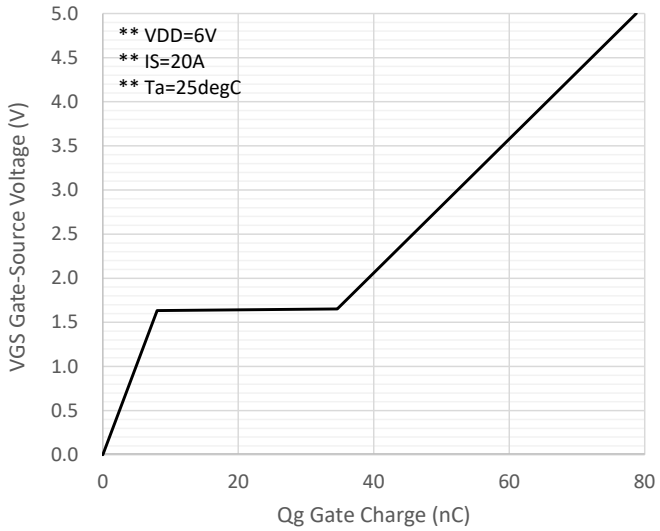
IGS to VGS



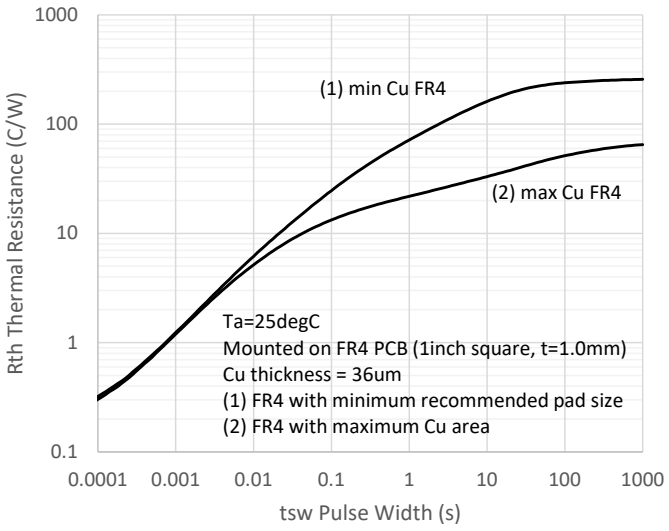
IGS to VGS



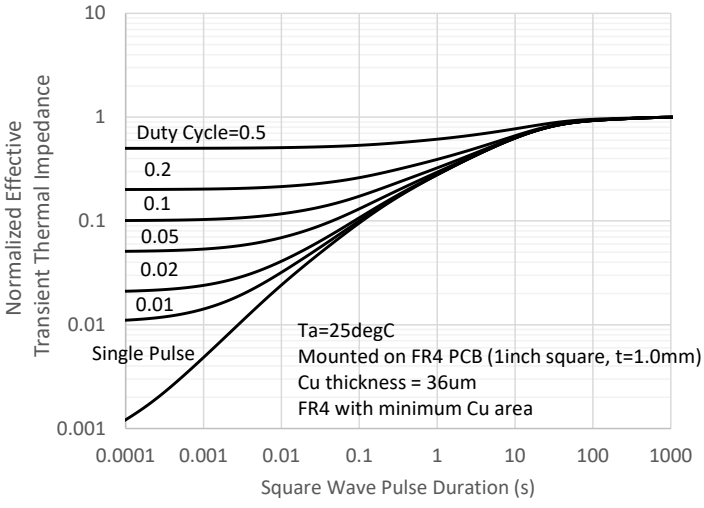
Dynamic Input / Output Characteristics



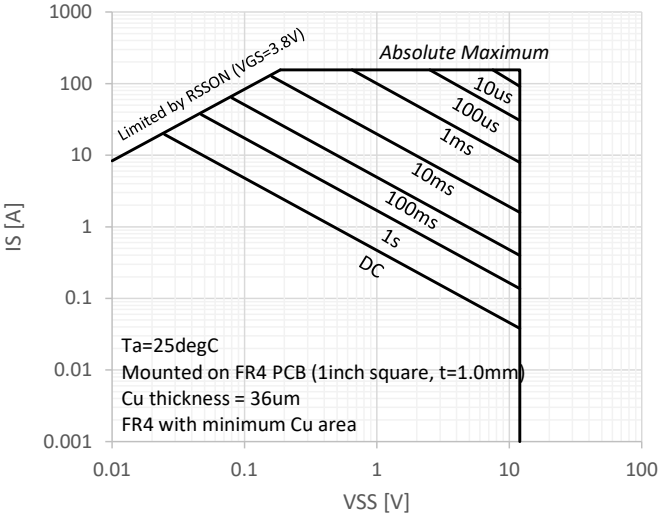
Rth to tsw



Thermal Response



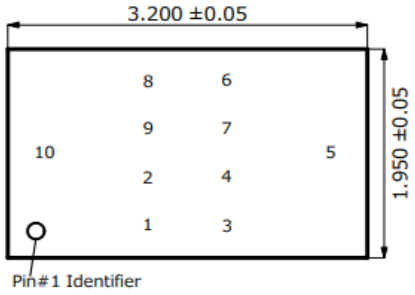
Safe Operating Area



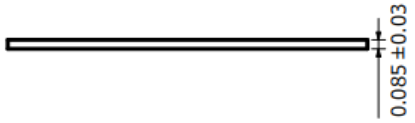
Package Outline Dimensions

Unit: mm

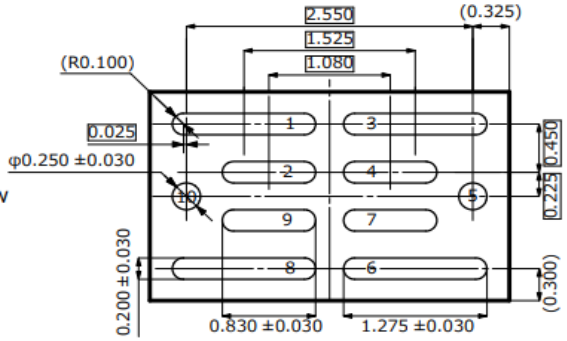
Top View



Front View

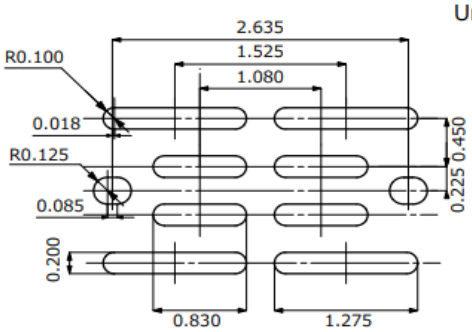


Bottom View



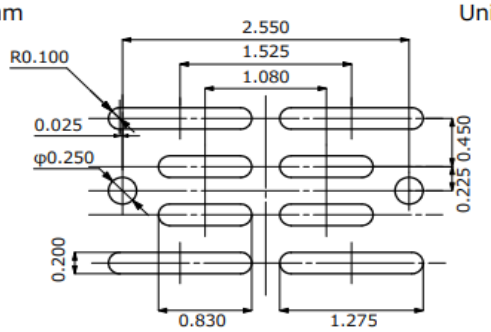
(Reference) Board Land Pattern

Unit: mm



(Reference) Stencil Mask Pattern

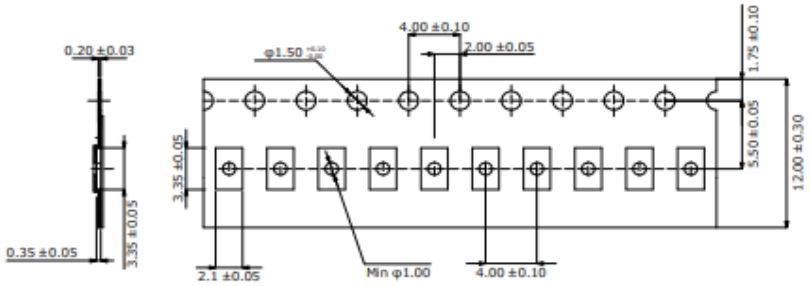
Unit: mm



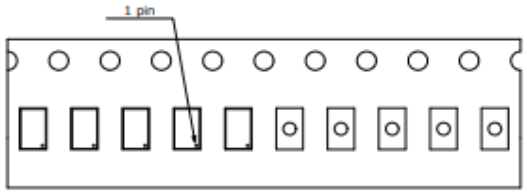
Form

- Tape & Reel Embossed Type: 5,000pcs / reel
- Factory PKG Code: WLCSP 3.20X1.95_10
- Tape Width: 12mm, Pitch: 4mm, Reel Size: 7inch

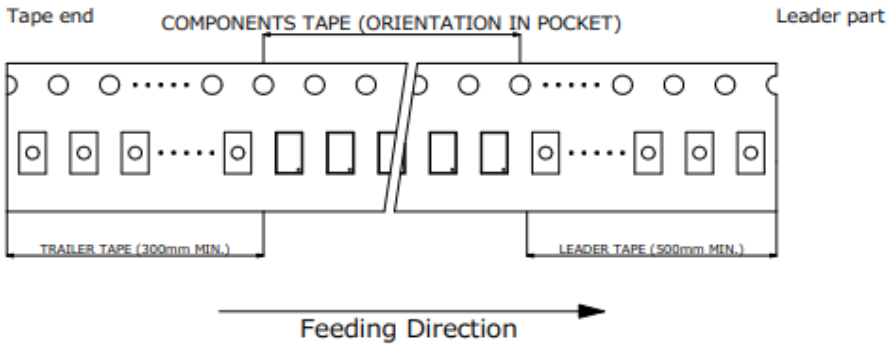
Tape size (mm)



Pin1 Direction



Tape end ~ Leader part (mm)



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