GOSTONE

Dual N-channel Power MOSFET:
12V, 3.7mohm, 17.0A

GTD1213A

Product Summary			
VSSS	VGSS	RSS(ON) TYP/MAX	IS MAX
12V	± 10.5V	3.7/4.7 mΩ@VGS=4.5V 3.9/4.9 mΩ@VGS=3.8V 4.1/5.9 mΩ@VGS=3.1V 4.7/7.9 mΩ@VGS=2.5V	17.0A

Features

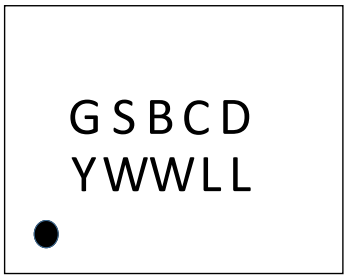
- ❖ CSP (Chip Size Package)
- ❖ Halogen-Free / RoHS Compliant
- ❖ 2.5V Drive Low Source-Source On-State Resistance
- ❖ Gate Resistor Installed Common-Drain Type MOSFET
- ❖ ESD Protection Diode Installed (Gate-Source)

Application

- ❖ Lithium-Ion Secondary Battery Protection Circuits

Marking Symbol Code

- ❖ Laser Marking Device Code: GSBCD

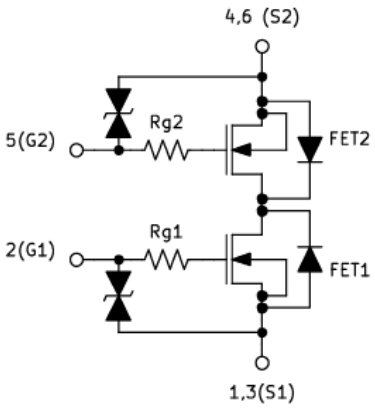


GS : Gostone (fixed)
BC : Marking Device Code (fixed)
D : Factory Code (fixed)
Y : Year Code
W : Week Code
L : LOT Code
● : Pin#1 Identifier

Form

- ❖ Tape & Reel Embossed Type: 8,000pcs / reel

Equivalent circuit

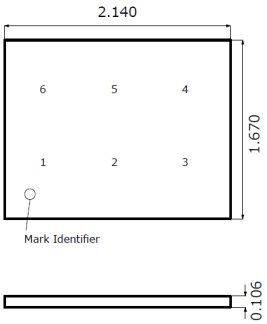


Absolute Maximum Rating Ta=25℃				
Parameter		Symbol	Rating	Unit
Source to Source Voltage		VSS	12	V
Gate to Source Voltage		VGS	±10.5	V
Source Current	DC	IS1 *1	8.8	A
	DC	IS2 *2	17.0	A
	Pulse	ISP *2*3	80	A
Total Dissipation	DC	PD1 *1	0.42	W
	DC	PD2 *2	1.42	W
Junction Temperature		Tj	150	℃
Storage Temperature		Tstg	-55 to +150	℃

Thermal Characteristics Ta = 25℃			
Parameter	Symbol	Rating	Unit
Thermal Resistance	Rth *1	296	℃/W
	Rth *2	88	℃/W

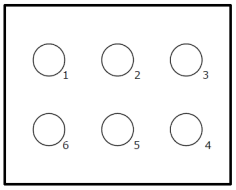
Note *1 Mounted on FR4 board (25.4mm x 25.4mm x t1.0mm)
with minimum copper pad (45.5mm2, 36μm thickness copper)
Note *2 Mounted on FR4 board (25.4mm x 25.4mm x t1.0mm)
with maximum copper pad (615.5mm2, 36μm thickness copper)
Note *3 t=10μs, duty cycle ≤ 1%

TOP View



FET1: 1, 3: Source1, 2: Gate1
FET2: 4, 6: Source2, 5: Gate2

Bottm View



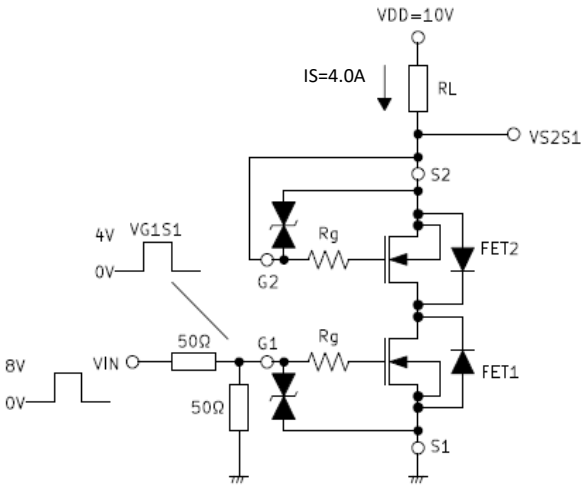
Electrical Characteristics (Ta=25degC +/- 3degC)

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			1.0	μA
Gate-Source Leakage Current	IGSS	VGS=±8V, VSS=0V			±10.0	μA
		VGS=±5V, VSS=0V			±1.0	μA
Gate-Source Threshold Voltage	Vth	VSS=6V, IS=1.0mA	0.4	0.75	1.4	V
Source-Source On-State Resistance	RSS(on)1	IS=4.0A, VGS=4.5V	2.6	3.7	4.7	mΩ
	RSS(on)2	IS=4.0A, VGS=3.8V	2.7	3.9	4.9	
	RSS(on)3	IS=4.0A, VGS=3.1V	2.9	4.1	5.9	
	RSS(on)4	IS=4.0A, VGS=2.5V	3.1	4.7	7.9	
Body Diode Forward Voltage	VF(S-S)	IF=4.0A, VGS=0V		0.65	1.2	V
Input Capacitance *1	Ciss	VSS=10V, VGS=0V, f=1kHz		3,020		pF
Output Capacitance *1	Coss			405		
Reverse Transfer Capacitance *1	Crss			330		
Turn-On Delay Time *1 *2	td(on)	VDD=10V, VGS=0 to 4.0V, IS=4.0A		0.4		μs
Rise Time *1 *2	tr			0.8		
Turn-Off Delay Time *1 *2	td(off)	VDD=10V, VGS=4.0 to 0V, IS=4.0A		3.1		μs
Fall Time *1 *2	tf			2.3		
Total Gate Charge *1	Qg	VDD=10V, VGS=0 to 4.0V, IS=4.0A		29.0		nC
Gate-Source Charge *1	Qgs			4.1		
Gate-Drain Charge *1	Qgd			9.4		
Gate Resistance *1	Rg	f=1MHz		610		Ω

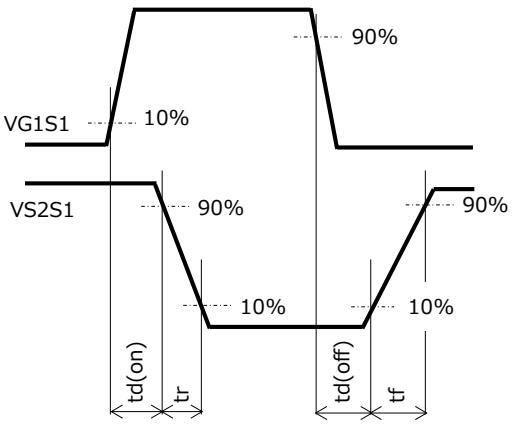
Note *1 Guaranteed by Design

Note *2 Measurement Circuit for Switching Characteristics

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

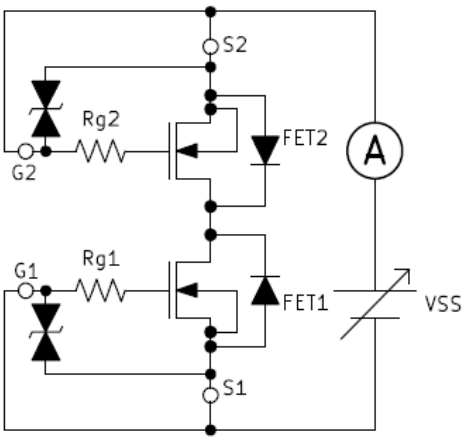


(Definition of Switching Measurement Detection)

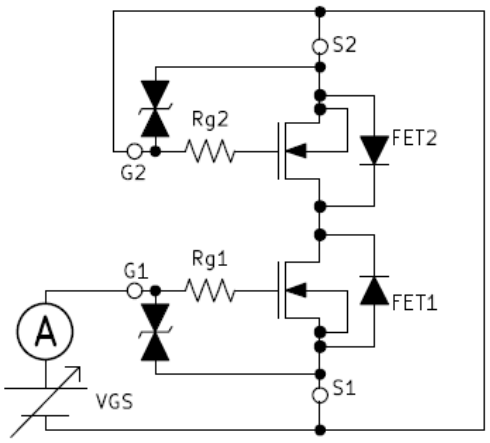


Test circuits for FET1

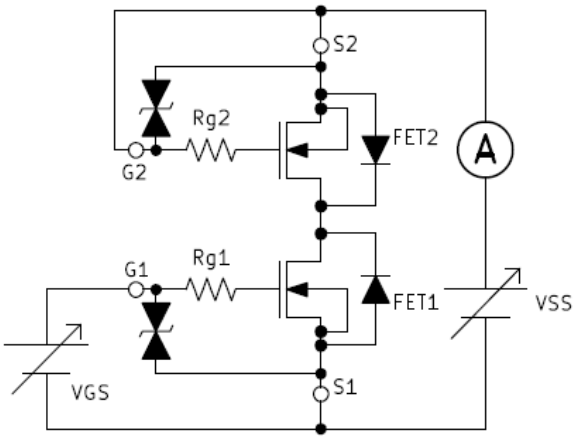
Test Circuit 1
VSSS/ISSS



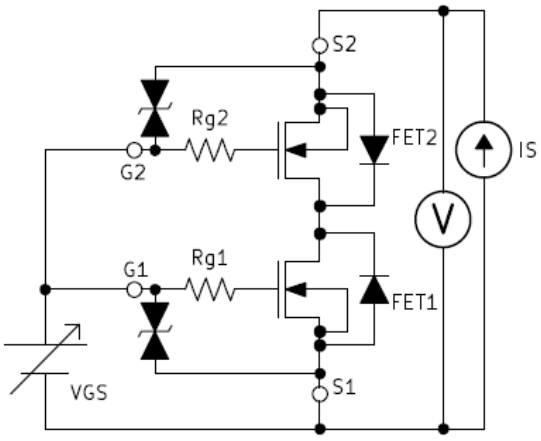
Test Circuit 2
IGSS1/2



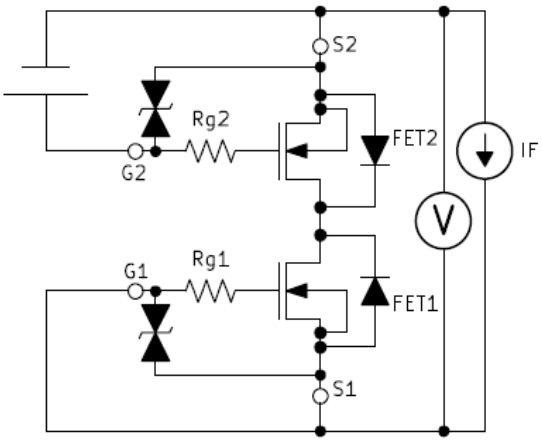
Test Circuit 3
Vth



Test Circuit 4
RSS(on)

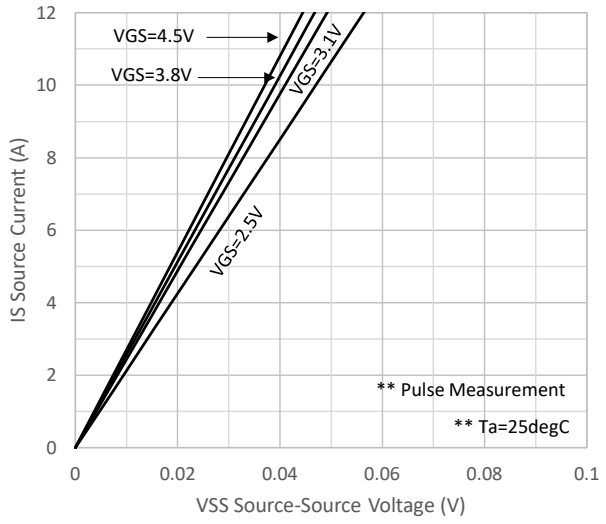


Test Circuit 5
VF(S-S)

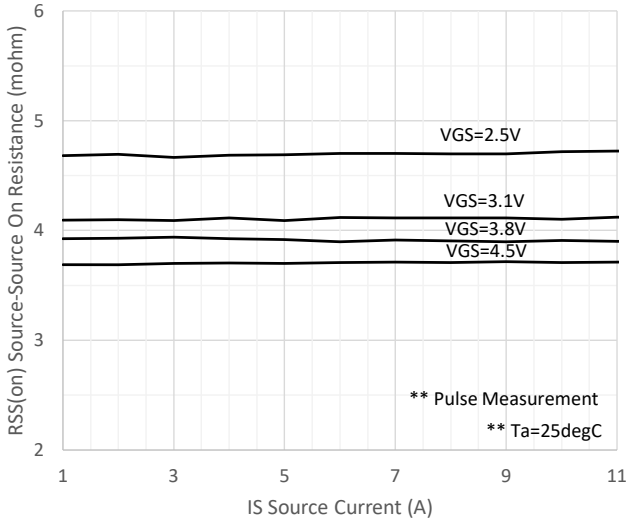


Technical data

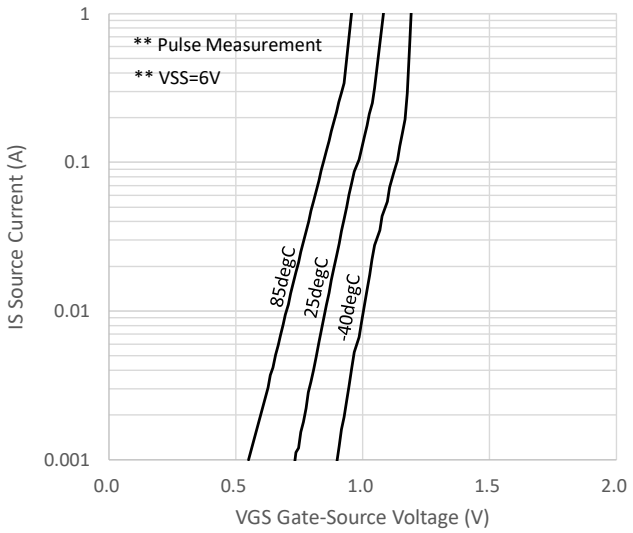
IS to VSS



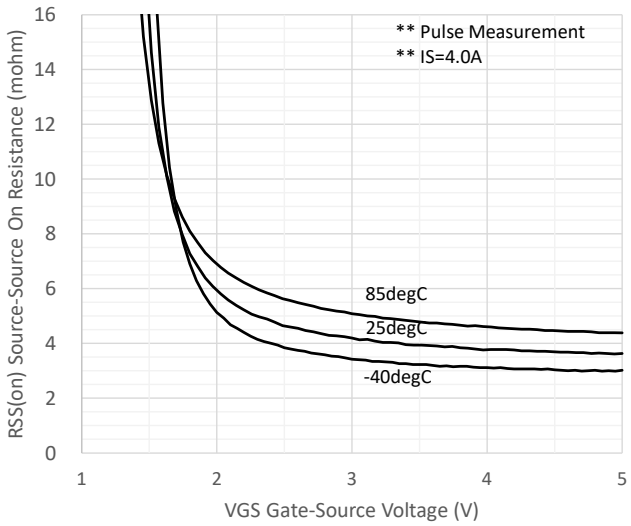
RSS(on) to IS



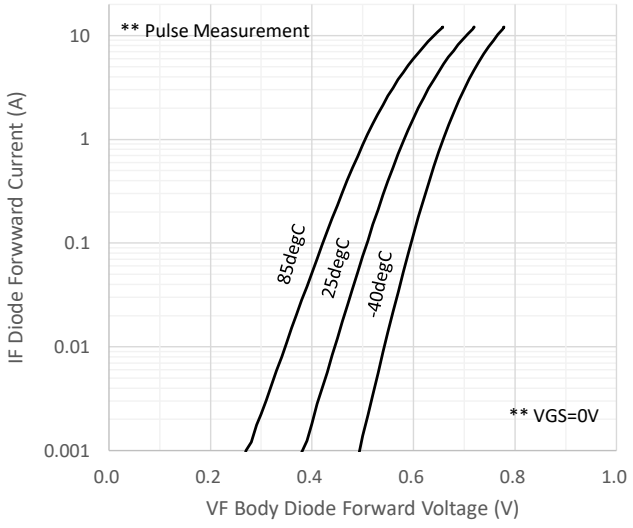
IS to VGS



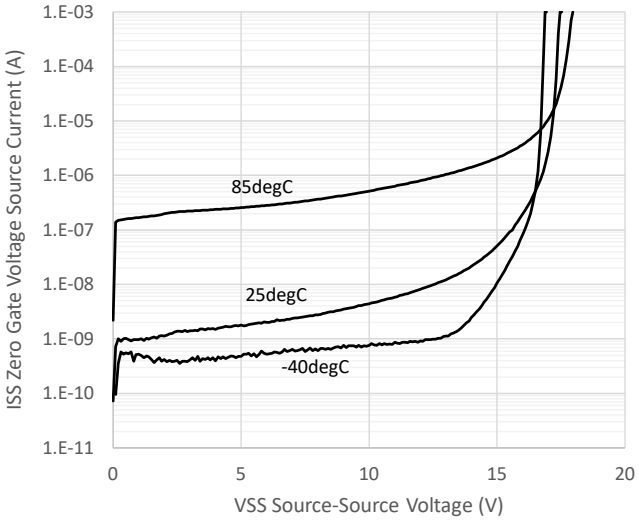
RSS(on) to VGS



IF to VF

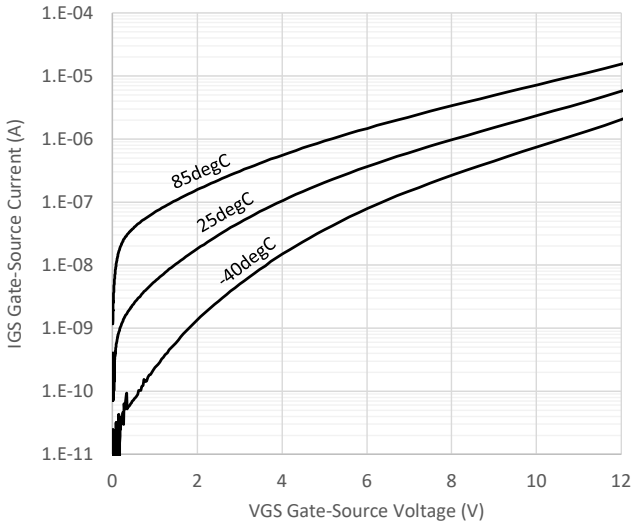


ISS to VSS

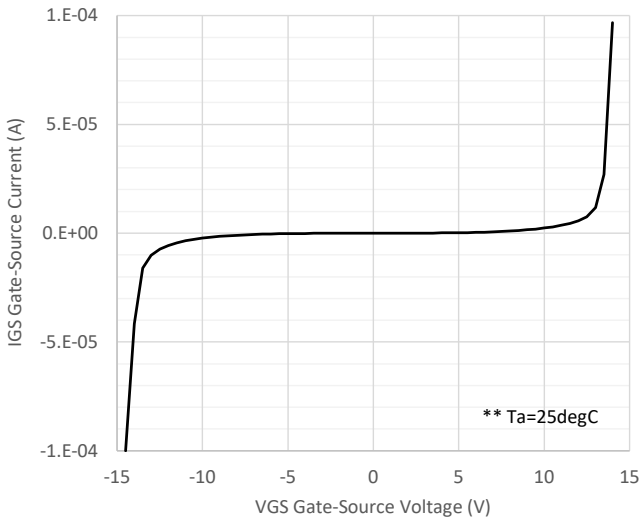


Technical data

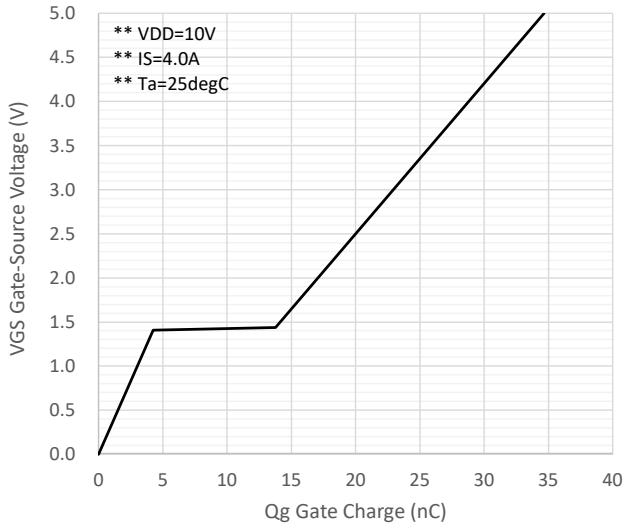
IGS to VGS



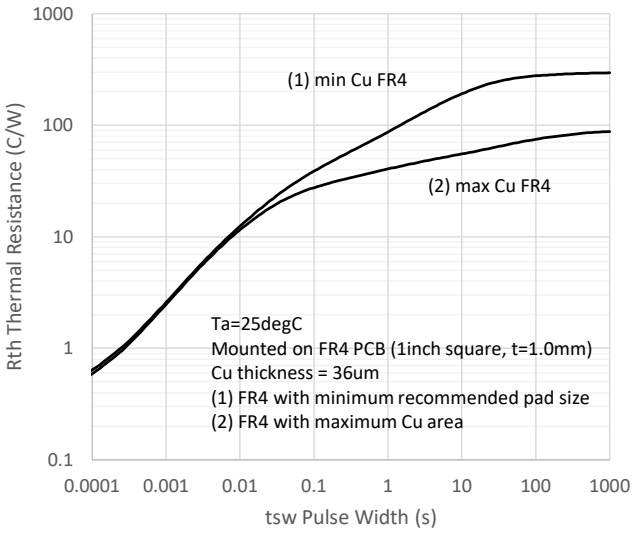
IGS to VGS



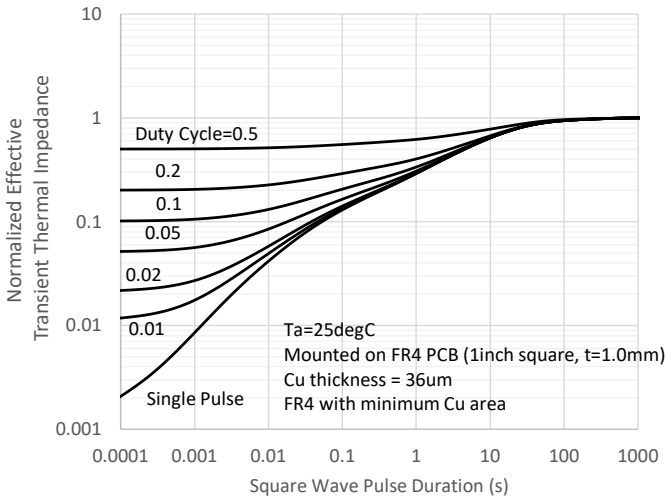
Dynamic Input / Output Characteristics



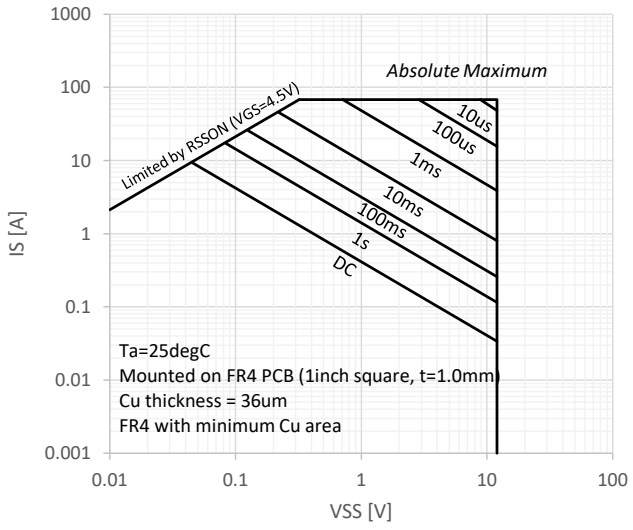
Rth to tsw



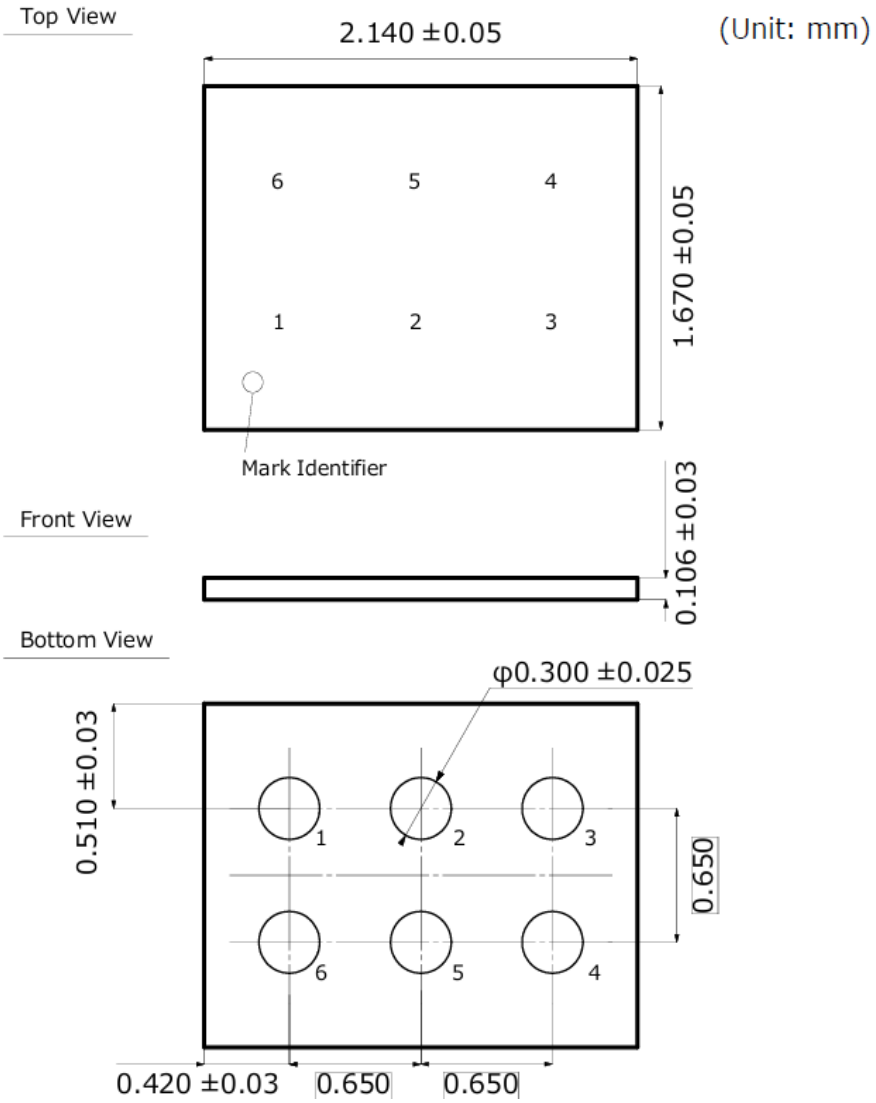
Thermal Response

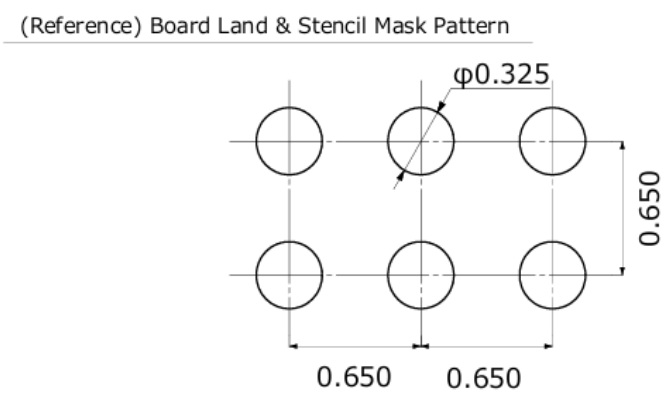


Safe Operating Area



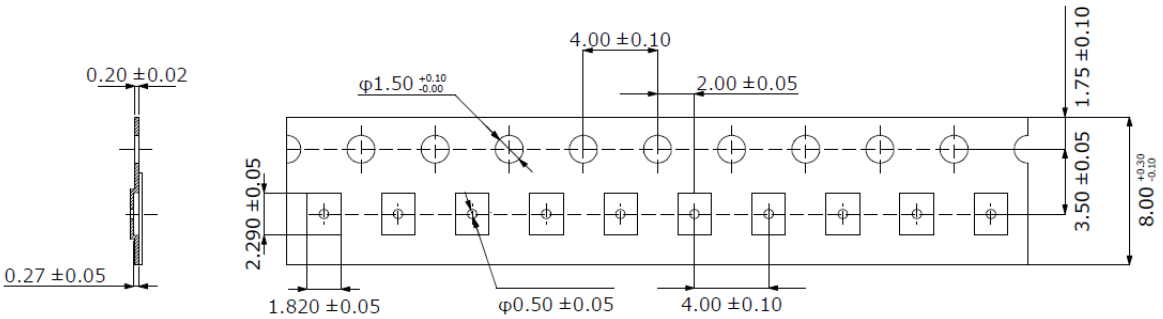
Package Outline Dimensions



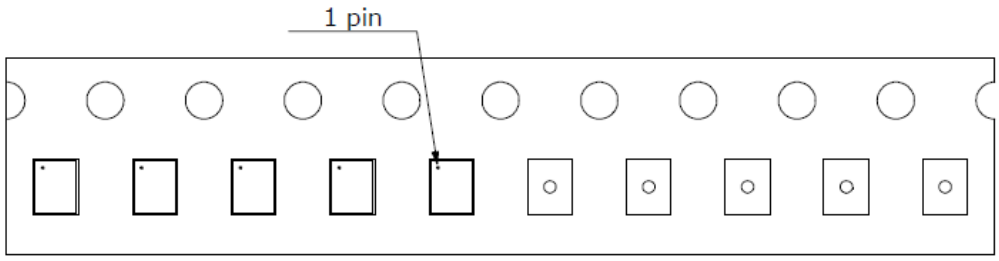


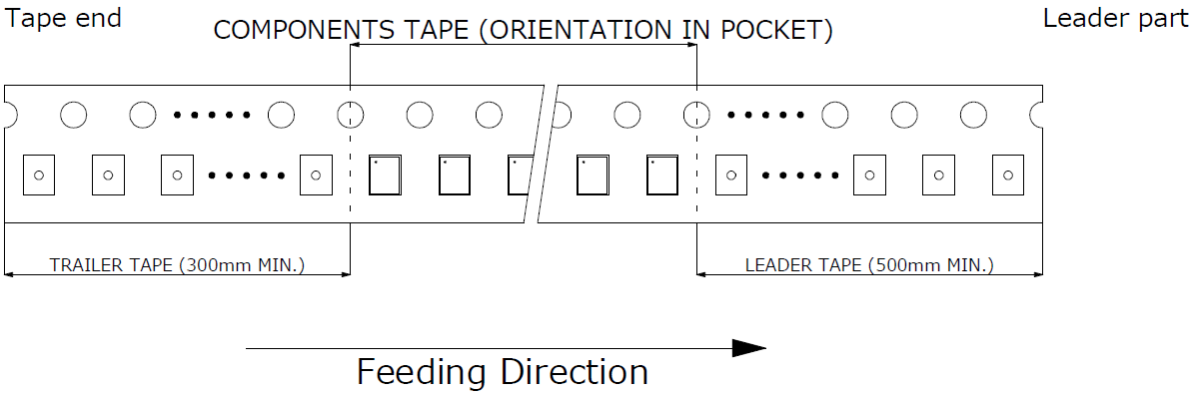
Form

- Tape & Reel Embossed Type: 8,000pcs / reel
- Factory PKG Code: WLCSP 2.14X1.67A_6
- Tape Width: 8mm, Pitch: 4mm, Reel Size: 7inch



1pin Direction





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