

Dual N-channel Power MOSFET:
12V, 2.0mohm, 25.7A

Product Summary

VSSS	VGSS	RSS(ON) TYP/MAX	IS MAX
12V	± 8V	2.0/2.6 mΩ@VGS=4.5V 2.1/2.7 mΩ@VGS=3.8V 2.4/3.8 mΩ@VGS=3.1V 2.8/5.8 mΩ@VGS=2.5V	25.7A

Marking Symbol Code

- ❖ Laser Marking Device Code: BE



GS : Gostone (fixed)
BE : 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

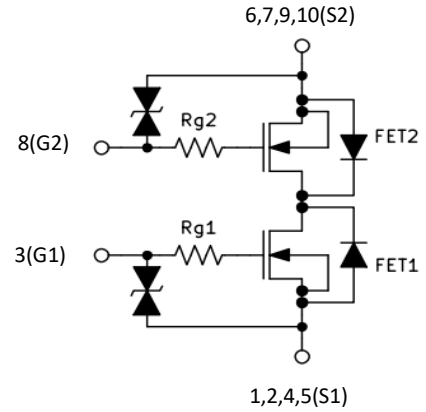
Features

- ❖ 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

Equivalent circuit



Absolute Maximum Rating Ta=25°C

Parameter	Symbol	Rating	Unit
Source to Source Voltage	VSS	12	V
Gate to Source Voltage	VGS	±8	V
Source Current	DC	IS1 *1	12.8 A
	DC	IS2 *2	25.7 A
	Pulse	ISP *2*3	103.0 A
Total Dissipation	DC	PD1 *1	0.46 W
	DC	PD2 *2	1.79 W
Junction Temperature	TJ	150	°C
Storage Temperature	Tstg	-55 to +150	°C

Thermal Characteristics Ta = 25°C

Parameter	Symbol	Rating	Unit
Thermal Resistance	Rth *1	274	°C/W
	Rth *2	70	°C/W

Note *1 Mounted on FR4 board (25.4mm x 25.4mm x t1.0mm)

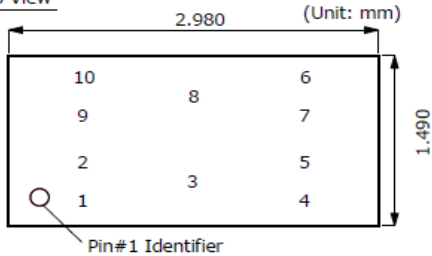
with minimum copper pad (48.8mm², 36μm thickness copper)

Note *2 Mounted on FR4 board (25.4mm x 25.4mm x t1.0mm)

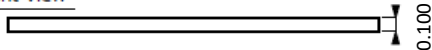
with maximum copper pad (618.2mm², 36μm thickness copper)

Note *3 t=10μs, duty cycle ≤ 1%

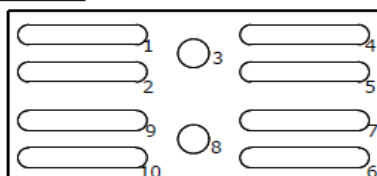
Top View



Front View



Bottom View



FET1: 1,2,4,5: Source1, 3: Gate1

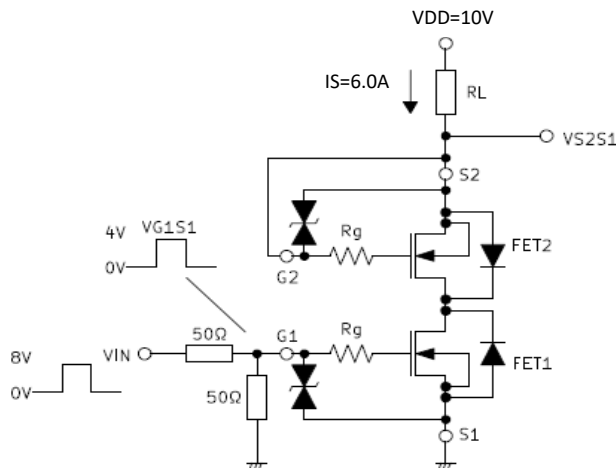
FET2: 6,7,9,10: Source2, 8: Gate2

Electrical Characteristics (Ta=25°C +/- 3°C)

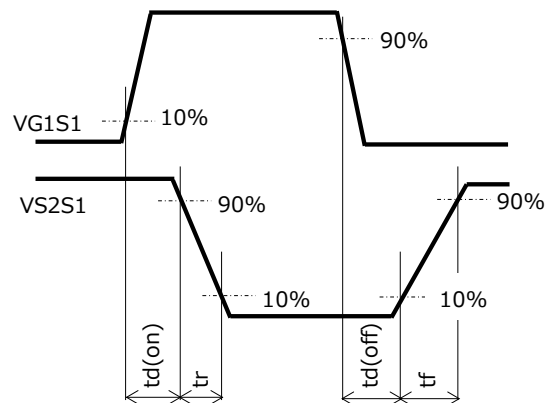
Parameter	Symbol	Conditions	Min	Typ	Max	Unit
Source-Source Breakdown Voltage	VSSS	IS=1mA, VGS=0V	12			V
Zero Gate Voltage Source Current	ISSS	VSS=12V, VGS=0V			1.0	μA
Gate-Source Leakage Current	IGSS	VGS=±8V, VSS=0V			±10.0	μA
		VGS=±5V, VSS=0V			±1.0	μA
Gate-Source Threshold Voltage	Vth	VSS=10V, IS=1.00mA	0.35	0.90	1.40	V
Source-Source On-State Resistance	RSS(on)1	IS=6.0A, VGS=4.5V	1.0	2.0	2.6	mΩ
	RSS(on)2	IS=6.0A, VGS=3.8V	1.1	2.1	2.7	
	RSS(on)3	IS=6.0A, VGS=3.1V	1.3	2.4	3.8	
	RSS(on)4	IS=6.0A, VGS=2.5V	1.6	2.8	5.8	
Body Diode Forward Voltage	VF(S-S)	IF=6.0A, VGS=0V		0.68	1.2	V
Input Capacitance ^{*1}	Ciss	VSS=10V, VGS=0V, f=1kHz		4,800		pF
Output Capacitance ^{*1}	Coss			595		
Reverse Transfer Capacitance ^{*1}	Crss			505		
Turn-On Delay Time ^{*1*2}	td(on)	VDD=6.0V, VGS=0 to 4.0V, IS=6.0A		1.4		μs
Rise Time ^{*1*2}	tr			2.2		
Turn-Off Delay Time ^{*1*2}	td(off)	VDD=6.0V, VGS=4.0 to 0V, IS=6.0A		5.2		μs
Fall Time ^{*1*2}	tf			4.1		
Total Gate Charge ^{*1}	Qg	VDD=6.0V, VGS=0 to 4.0V, IS=6.0A		42		nC
Gate-Source Charge ^{*1}	Qgs			10		
Gate-Drain Charge ^{*1}	Qgd			12		
Gate Resistance ^{*1}	Rg	f=1MHz		930		Ω

Note *1 Guaranteed by Design

Note *2 Measurement Circuit for Switching Characteristics

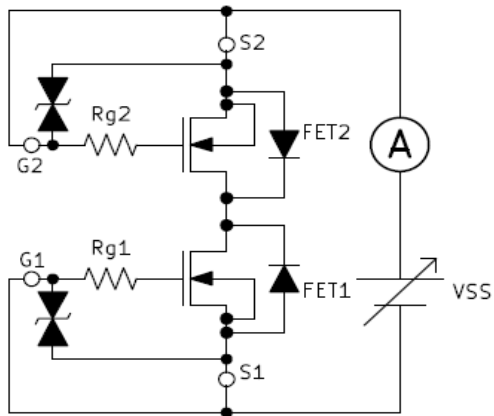
FET1 Measurement Circuit for Switching Characteristics td(on), tr, td(off), tf (FET2: Gate-Source Short)


(Definition of Switching Measurement Detection)

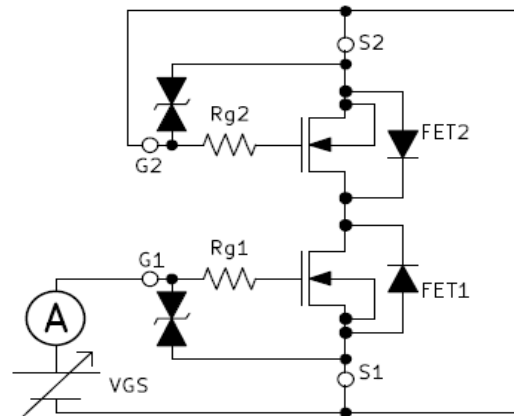


Test circuits for FET1

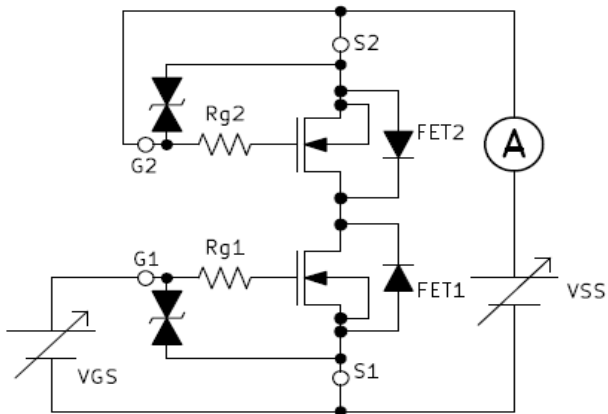
Test Circuit 1
VSSS/ISSS



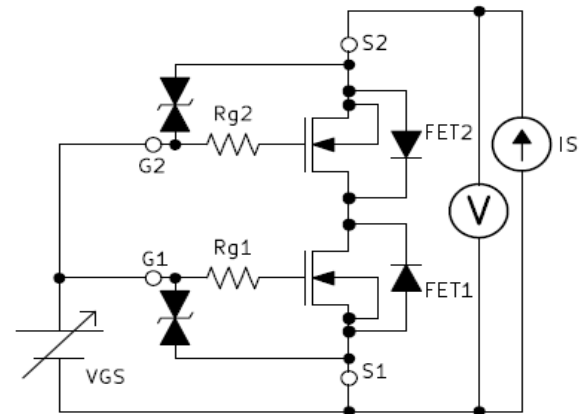
Test Circuit 2
IGSS1/2



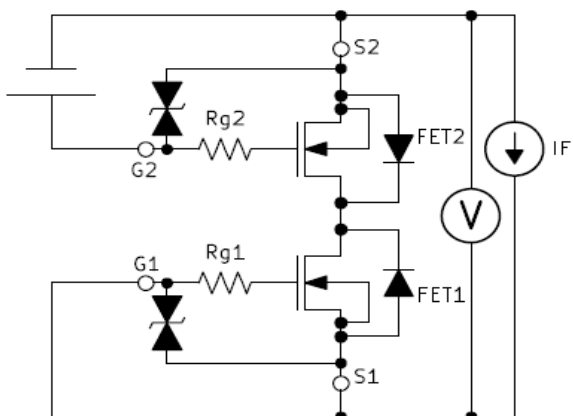
Test Circuit 3
Vth

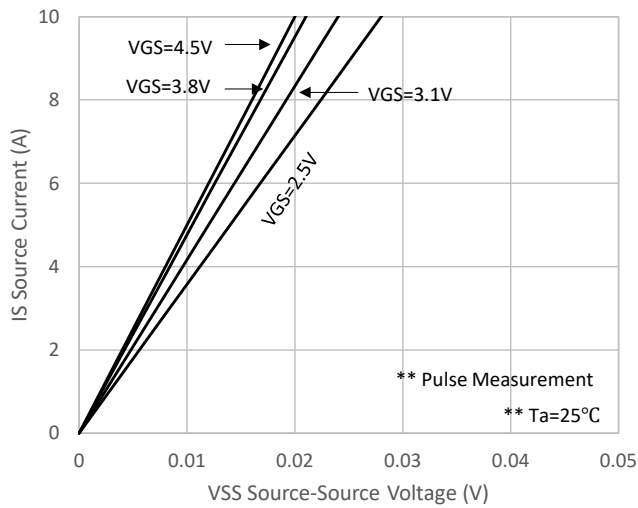
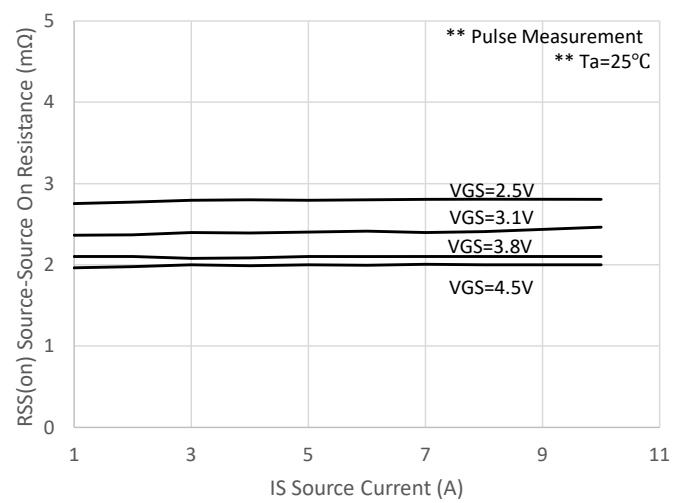
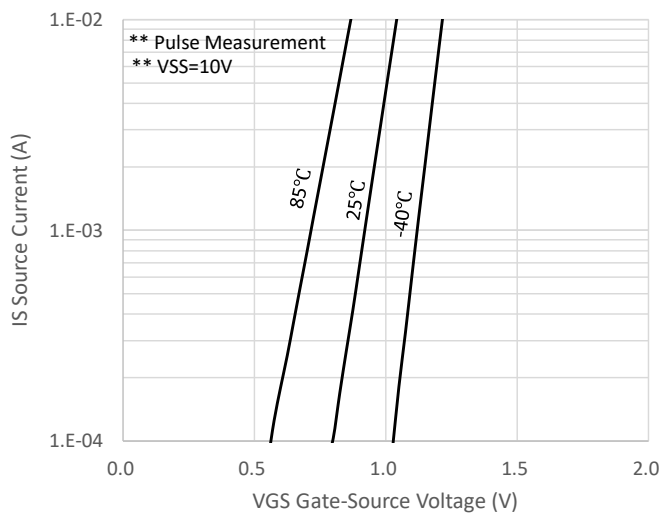
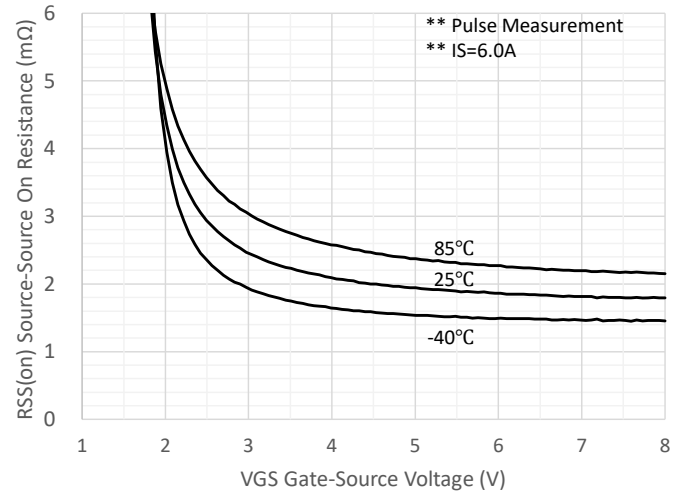
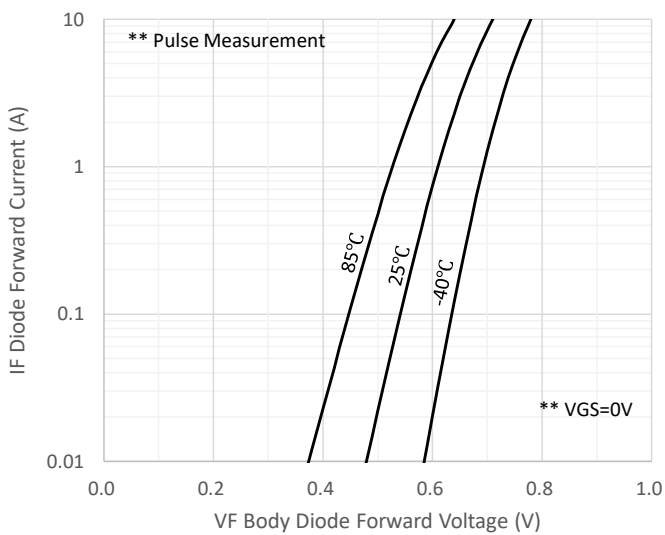
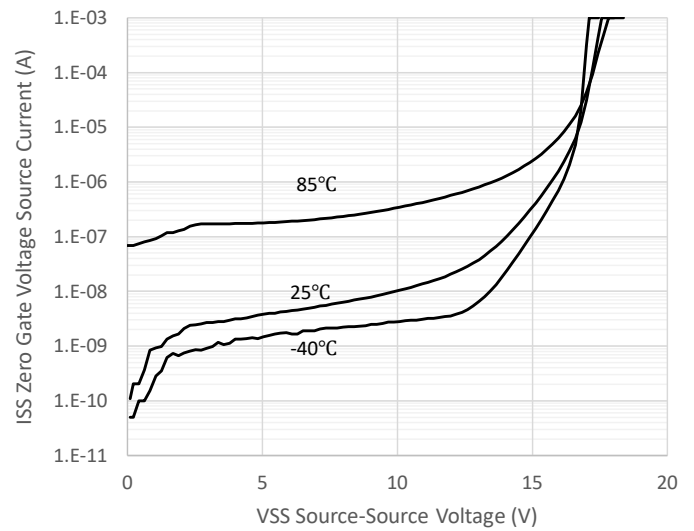


Test Circuit 4
RSS(on)



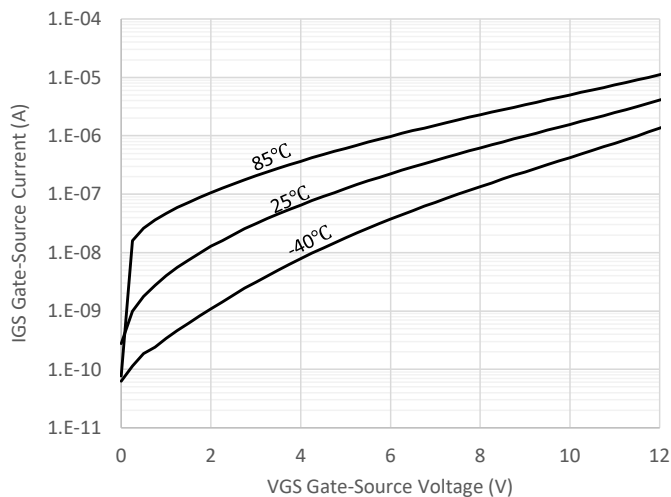
Test Circuit 5
VF(S-S)



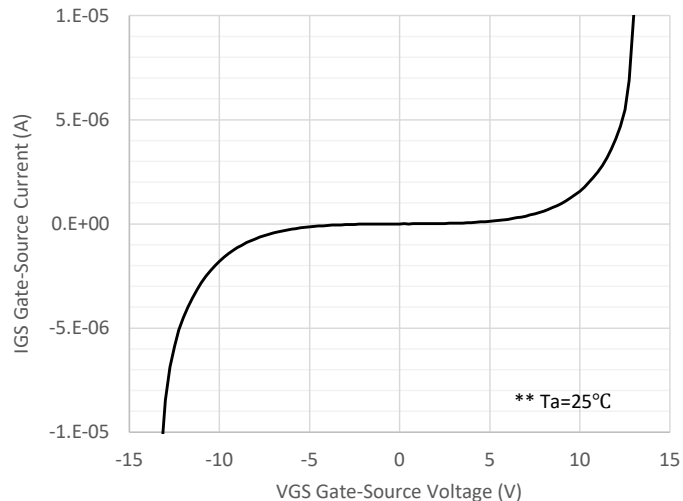
Technical data
IS to VSS

RSS(on) to IS

IS to VGS

RSS(on) to VGS

IF to VF

ISS to VSS


Technical data

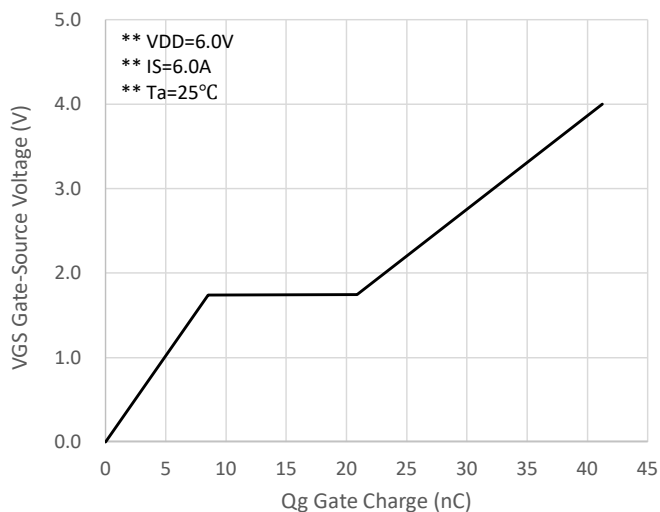
IGS to VGS



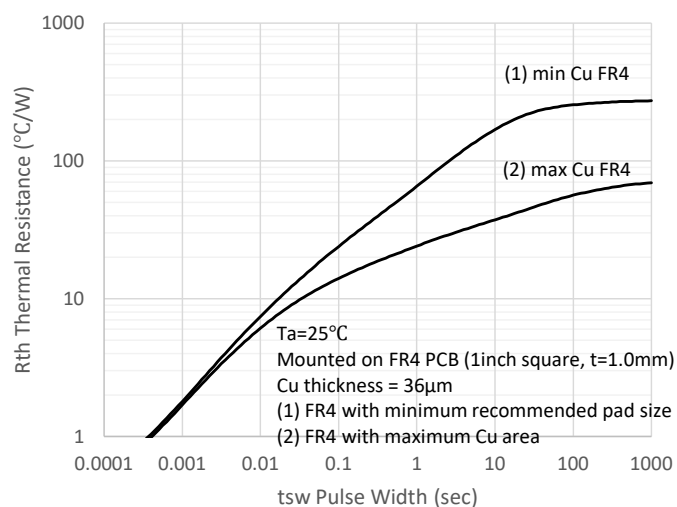
IGS to VGS



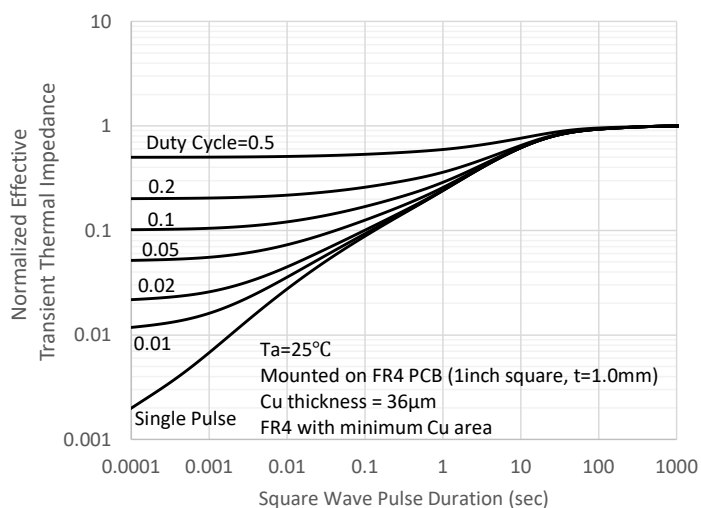
Dynamic Input / Output Characteristics



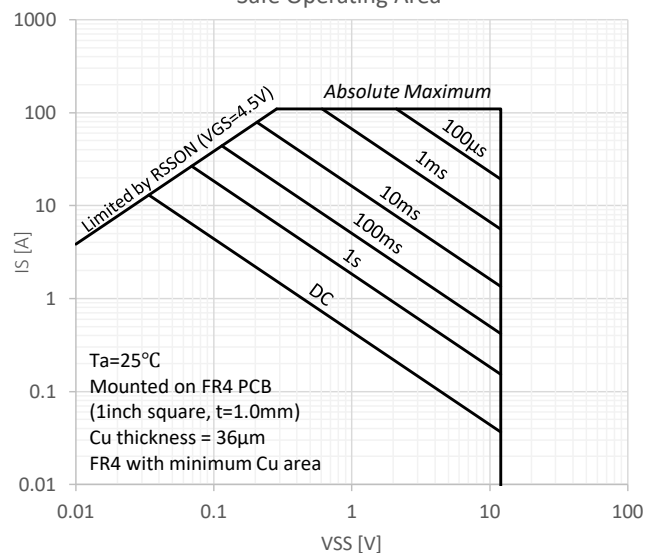
Rth to tsw



Thermal Response



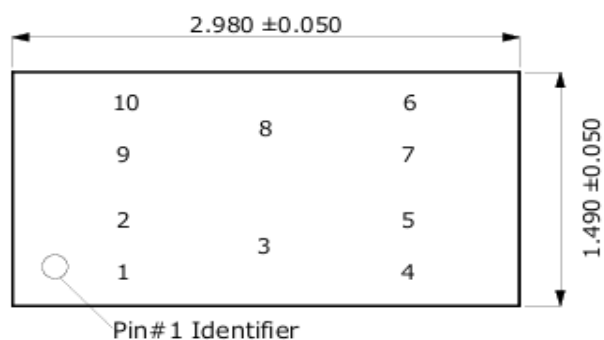
Safe Operating Area



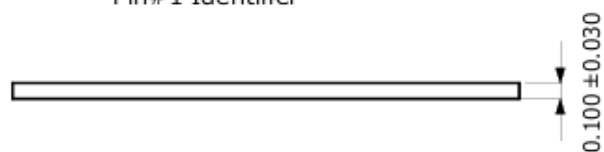
Package Outline Dimensions

Top View

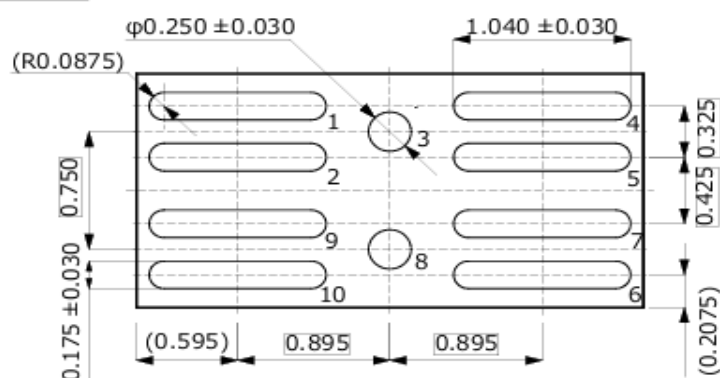
Unit: mm



Front View

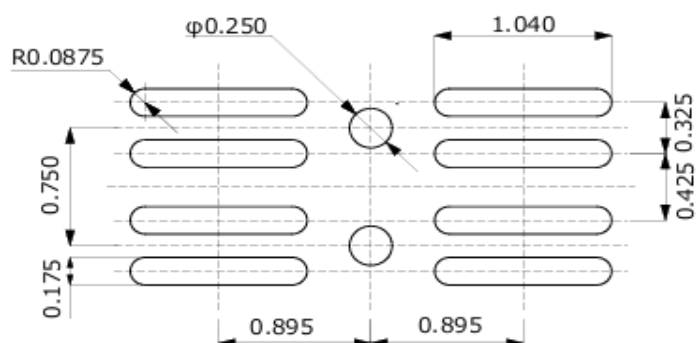


Bottom View



(Reference) Board Land and Stencil Mask Pattern

Unit: mm



- ❖ Tape & Reel Embossed Type: 8,000pcs / reel
- ❖ Factory PKG Code: WLCSP 3.00X1.51_10
- ❖ Tape Width: 8mm, Pitch: 4mm, Reel Size: 7inch

A diagram of a 16-pin connector. It shows a horizontal row of 16 circular pins. Below the pins are 16 rectangular slots. The first five slots contain a small dot, and the next eleven slots contain a small circle. A label '1 pin' with an arrow points to the first pin.

The diagram illustrates the layout of a tape used for component feeding. It shows a sequence of components (represented by circles and rectangles) oriented in the pockets of the tape. The tape is divided into two main sections: the Trailer Tape (300mm MIN.) and the Leader Tape (500mm MIN.). The Feeding Direction is indicated by an arrow pointing to the right.

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