

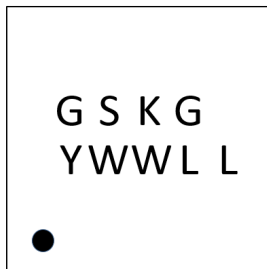
Dual N-channel Power MOSFET:
12V, 1.5mohm, 27.7A

Product Summary

VSSS	VGSS	RSS(ON) TYP/MAX		IS MAX
12V	± 8V	1.50/1.95	mΩ@VGS=4.5V	27.7A
		1.60/2.10	mΩ@VGS=3.8V	
		1.90/2.75	mΩ@VGS=3.1V	
		2.45/4.70	mΩ@VGS=2.5V	

Marking Symbol Code

- ❖ Laser Marking Device Code: K



GS : Gostone (fixed)
K : 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

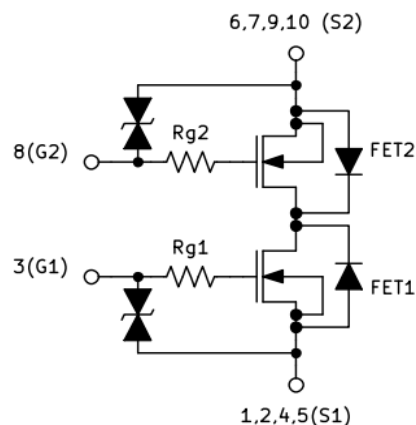
Features

- ❖ 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}	14.4 A
	DC	IS2 ^{*2}	27.7 A
	Pulse	ISP ^{*2*3}	110 A
Total Dissipation	DC	PD1 ^{*1}	0.46 W
	DC	PD2 ^{*2}	1.72 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}	269	°C/W
	Rth ^{*2}	73	°C/W

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

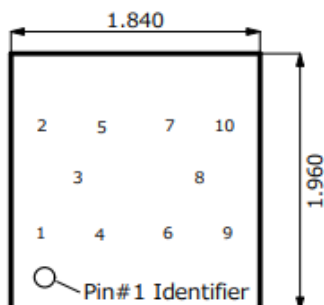
with minimum copper pad (44.6mm², 36μm thickness copper)

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

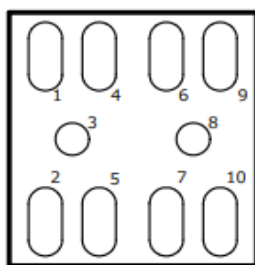
with maximum copper pad (617.5mm², 36μm thickness copper)

Note *3 t=10μs, duty cycle ≤ 1%

TOP View



Bottom View



(Unit: mm)

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

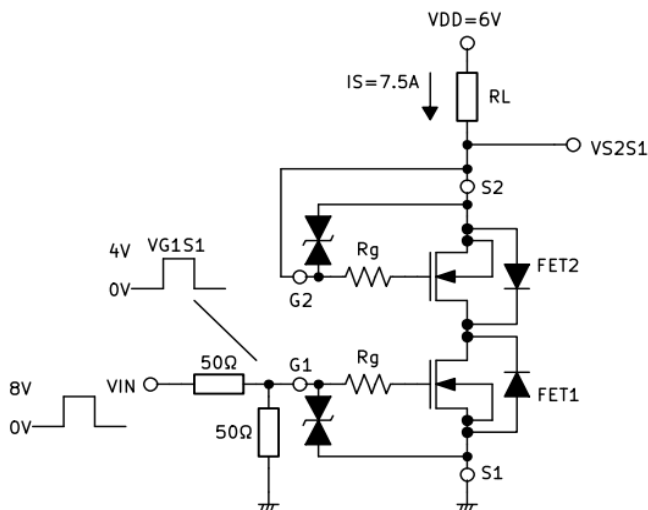
Electrical Characteristics (Ta=25degC +/- 3degC)

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			±5	μA
	IGSS2	VGS=±5V, VSS=0V			±0.5	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=7.5A, VGS=4.5V	1.05	1.50	1.95	mΩ
	RSS(on)2	IS=7.5A, VGS=3.8V	1.05	1.60	2.10	
	RSS(on)3	IS=7.5A, VGS=3.1V	1.15	1.90	2.75	
	RSS(on)4	IS=7.5A, VGS=2.5V	1.50	2.45	4.70	
Body Diode Forward Voltage	VF(S-S)	IF=7.5A, VGS=0V		0.7	1.0	V
Input Capacitance *1	Ciss	VSS=10V, VGS=0V, f=1kHz		2692		pF
Output Capacitance *1	Coss			731		
Reverse Transfer Capacitance *1	Crss			717		
Turn-On Delay Time *1 *2	td(on)	VDD=6V, VGS=0 to 4.0V, IS=7.5A		0.6		μs
Rise Time *1 *2	tr			1.8		
Turn-Off Delay Time *1 *2	td(off)	VDD=6V, VGS=4.0 to 0V, IS=7.5A		3.3		μs
Fall Time *1 *2	tf			3.3		
Total Gate Charge *1	Qg	VDD=6V, VGS=0 to 4.0V, IS=15A		38		nC
Gate-Source Charge *1	Qgs			4.4		
Gate-Drain Charge *1	Qgd			16.3		
Gate Resistance *1	Rg	f=1MHz		450		Ω

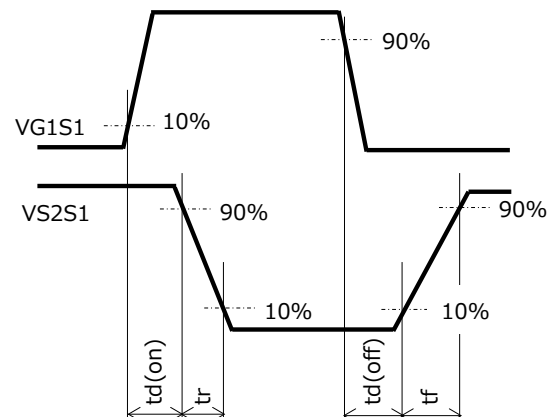
Note *1 Guaranteed by Design

Note *2 Measurement Circuit for Switching Characteristics

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

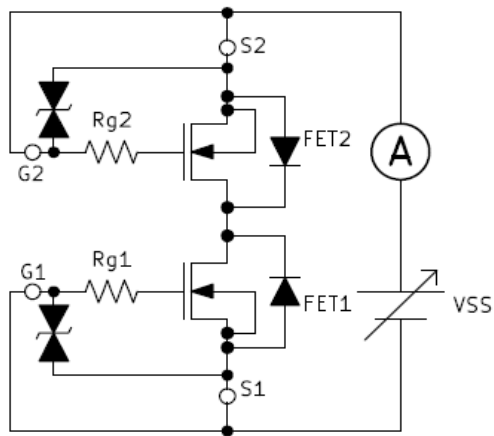


(Definition of Switching Measurement Detection)

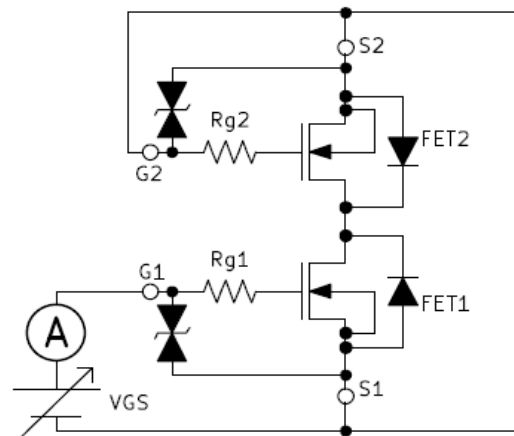


Test circuits for FET1

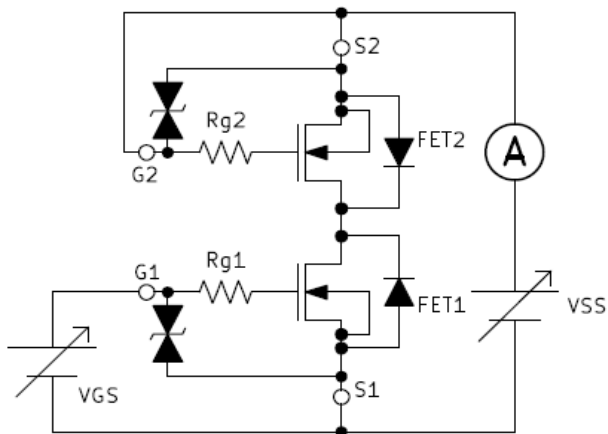
Test Circuit 1
VSSS/ISSS



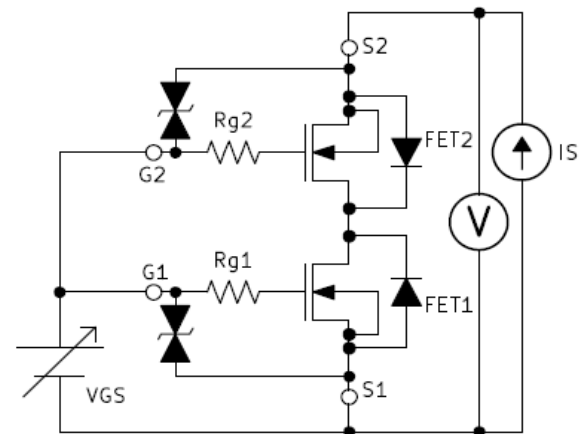
Test Circuit 2
IGSS1/2



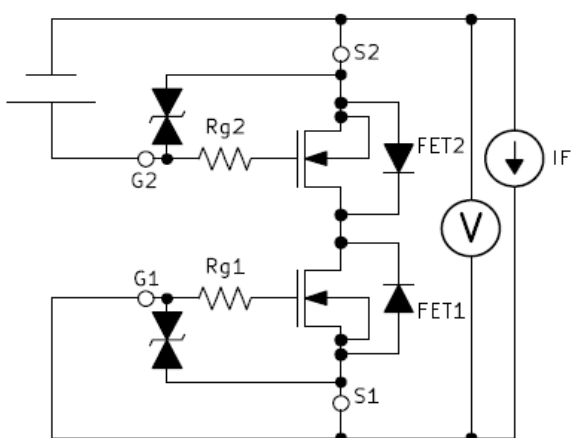
Test Circuit 3
Vth

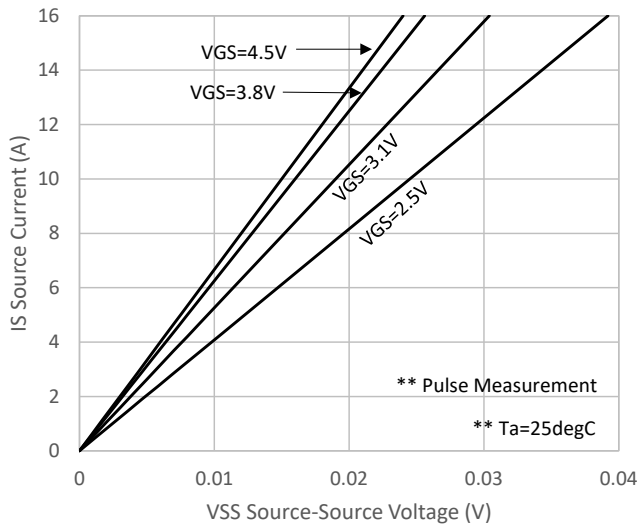
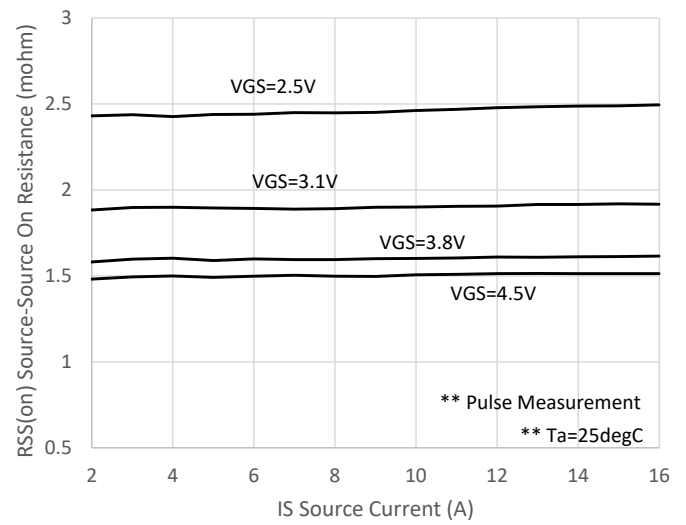
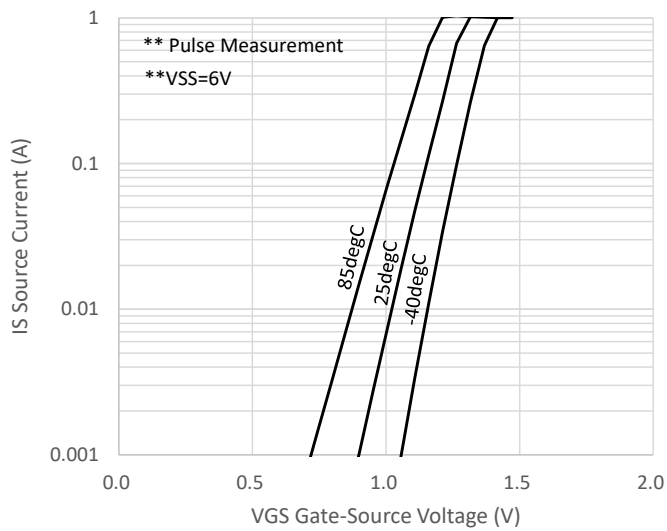
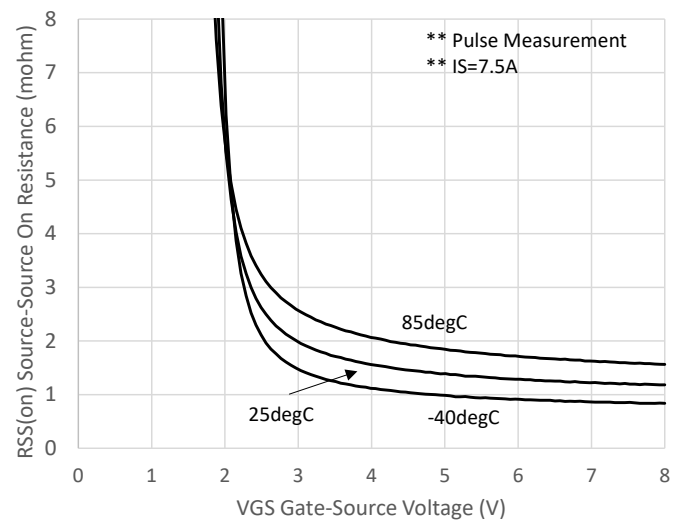
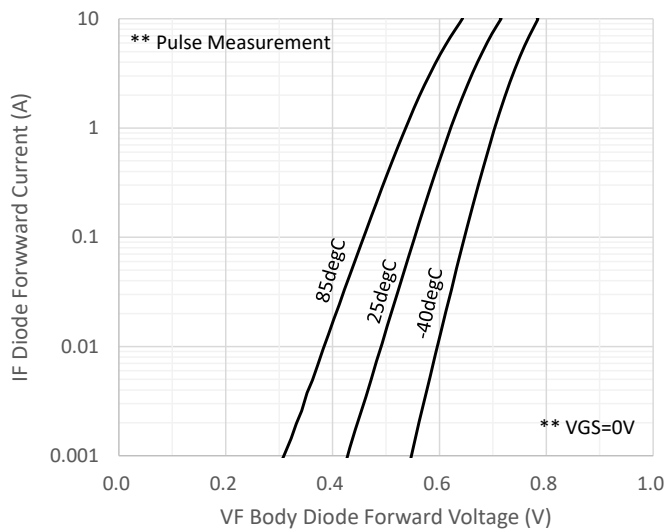
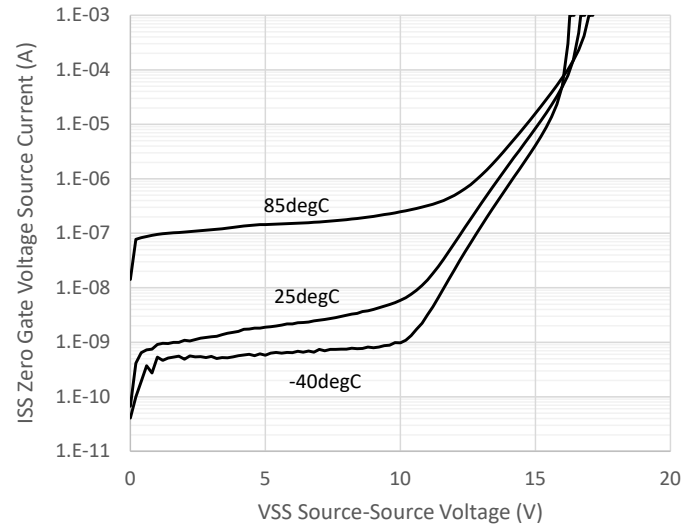


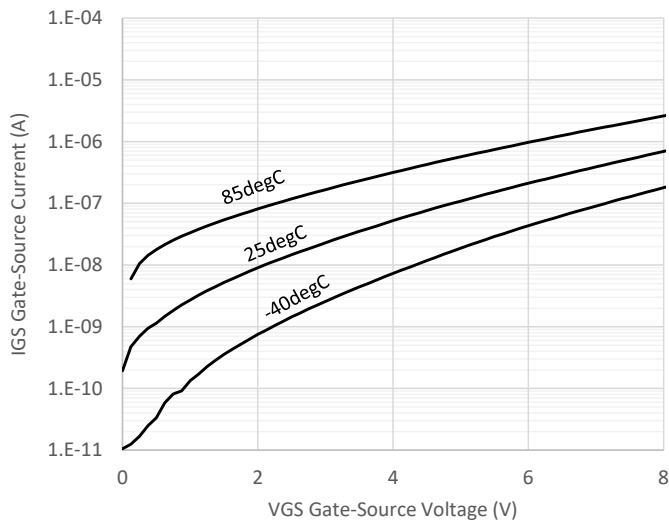
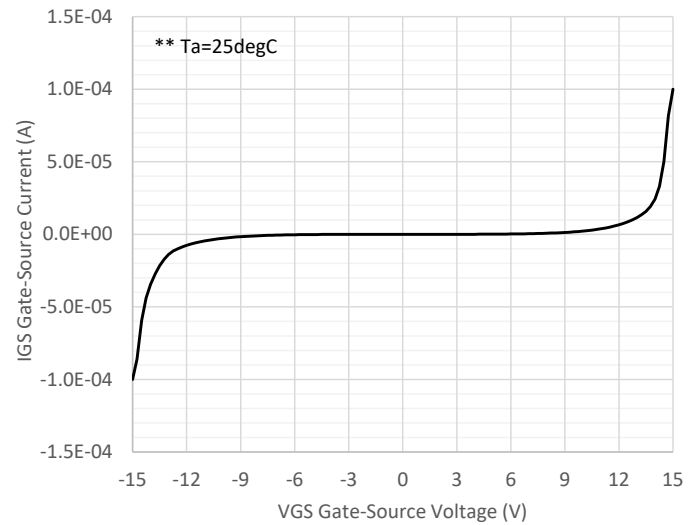
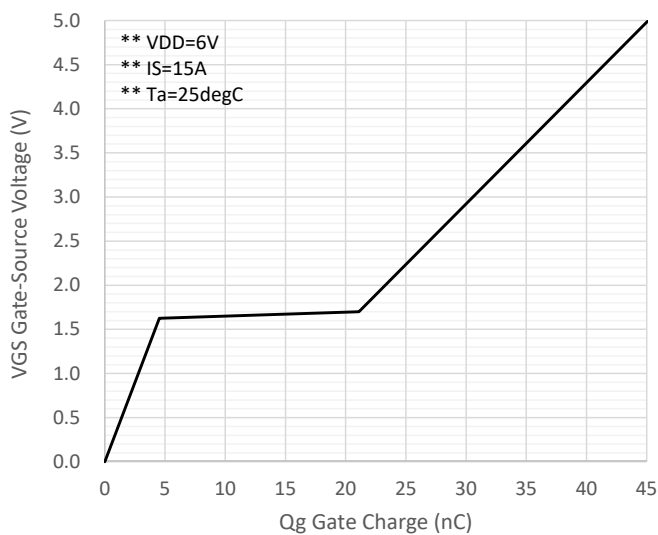
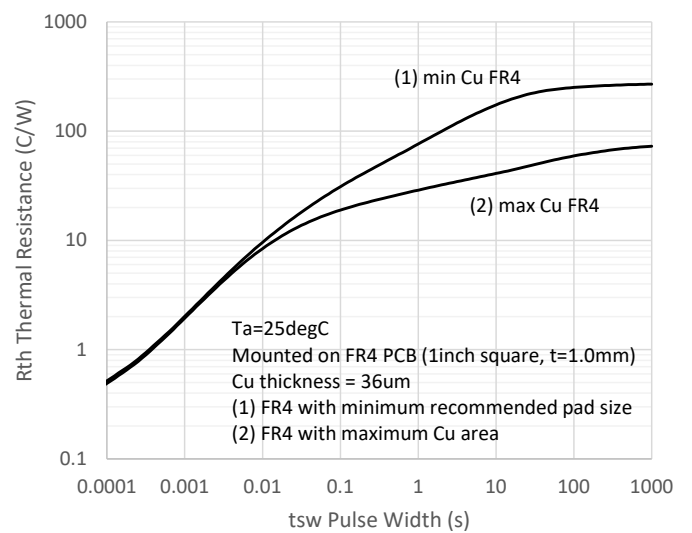
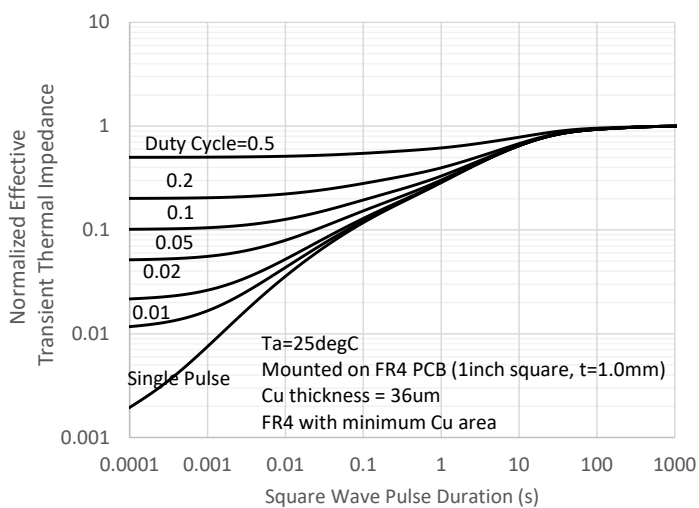
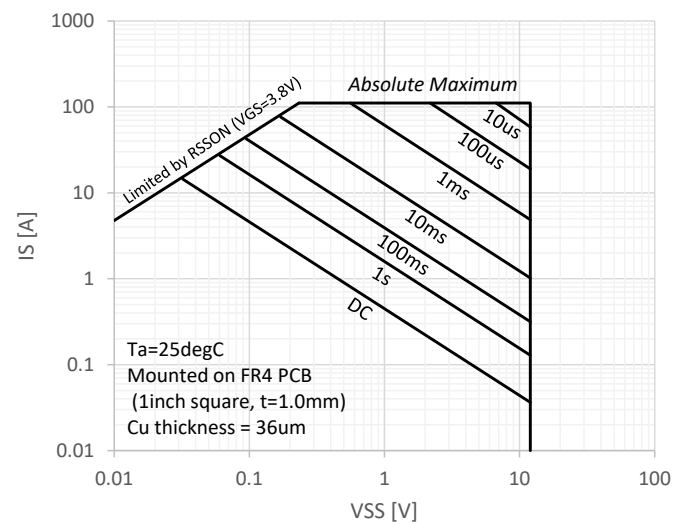
Test Circuit 4
RSS(on)



Test Circuit 5
VF(S-S)



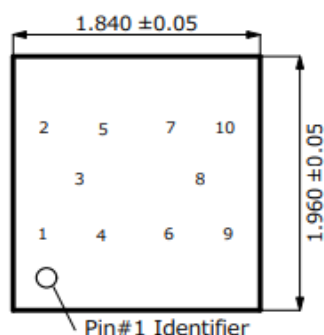
Technical data
IS to VSS

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


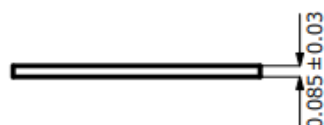
Package Outline Dimensions

Top View

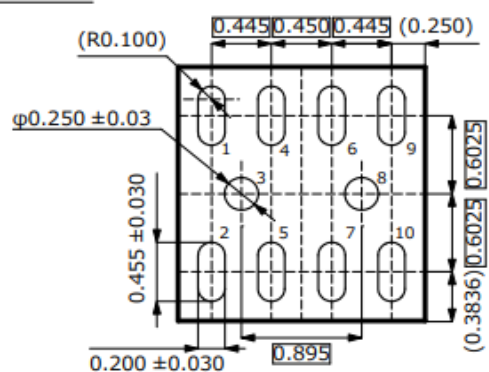
(Unit: mm)



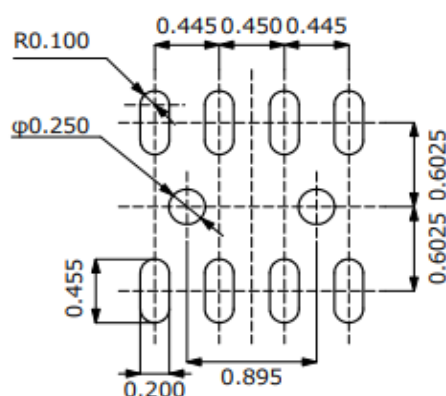
Front View



Bottom View



(Reference) Board Land and Stencil Mask Pattern



- ❖ Tape & Reel Embossed Type: 5,000pcs / reel
- ❖ Factory PKG Code: WLCSP 1.84X1.96_10
- ❖ Tape Width: 8mm, Pitch: 4mm, Reel Size: 7inch

Technical drawing of a 10-hole punch plate. The drawing shows a rectangular plate with 10 circular holes arranged in a single row. The overall dimensions are 8.00 ± 0.30 mm in height and 4.00 ± 0.10 mm in width. The distance between the centers of adjacent holes is 4.00 ± 0.10 mm. The distance from the center of the first hole to the left edge is 1.99 ± 0.05 mm. The distance from the center of the last hole to the right edge is 1.75 ± 0.10 mm. The thickness of the plate is 0.35 ± 0.05 mm. The diameter of the holes is 1.50 mm. The distance from the top edge to the center of the holes is 2.11 ± 0.05 mm. The distance from the bottom edge to the center of the holes is 2.11 ± 0.05 mm. The distance from the left edge to the center of the first hole is 0.20 ± 0.03 mm. The distance from the right edge to the center of the last hole is 0.20 ± 0.03 mm. The minimum distance between the holes and the edges is 1.00 mm.

A diagram of a 16-pin connector. It shows two rows of pins. The top row has 16 circular pins. The bottom row has 16 square pins. A label "1 pin" with a line pointing to the first pin in the top row indicates the pin numbering.

The diagram illustrates the layout of a Components Tape (Orientation in Pocket). It shows a continuous tape with two main sections: the TRAILER TAPE (300mm MIN.) on the left and the LEADER TAPE (500mm MIN.) on the right. The tape is divided into two rows of components. The top row contains circular components, and the bottom row contains square components. The components are arranged in a staggered pattern. The tape is labeled with 'Tape end' on the left and 'Leader part' on the right. A large arrow at the bottom indicates the 'Feeding Direction' from left to right. The title 'COMPONENTS TAPE (ORIENTATION IN POCKET)' is centered at the top.

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