

Dual N-channel Power MOSFET: 24V, 1.85mohm, 30A

Product Summary

VSSS	VGSS	RSS(ON) TYP/MAX	IS MAX
24V	± 20V	1.40/1.85 mΩ@VGS=10V 1.55/2.35 mΩ@VGS=8.0V 2.30/5.10 mΩ@VGS=4.5V	30A

Marking Symbol Code

❖ Laser Marking Device Code: V



V : Marking Device Code
A : Factory Code
Y : Year Code
W : Week Code
L : LOT Code
• : Pin#1 Identifier

Form

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

Absolute Maximum Rating (Ta=25°C)

Parameter	Symbol	Rating	Unit
Source to Source Voltage	VSS	24.0	V
Gate to Source Voltage	VGS	±20	V
Source Current	DC	IS1 *1	16 A
	DC	IS2 *2	30 A
	Pulse	ISP *2*3	120 A
Total Dissipation	DC	PD1 *1	0.5 W
	DC	PD2 *2	1.8 W
Junction Temperature	Tj	150	°C
Storage Temperature	Tstg	-55 to +150	°C

Thermal Characteristic (Ta=25°C)

Parameter	Symbol	Rating	Unit
Thermal Resistance	Rth *1	248	°C/W
	Rth *2	69	°C/W

Note *1 Mounted on FR4 board (25.4mm x 25.4mm x t1.0mm)
with minimum copper pad (36μm thickness copper)

Note *2 Mounted on FR4 board (25.4mm x 25.4mm x t1.0mm)
with maximum copper pad (36μm thickness copper)

Note *3 t=10μs, duty cycle ≤ 1%

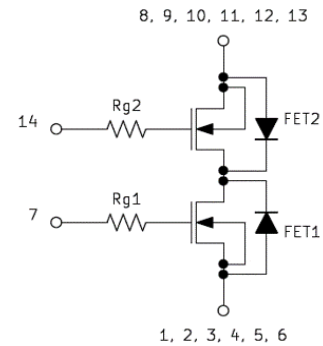
Features

- ❖ CSP (Chip Size Package)
- ❖ Halogen-Free / RoHS Compliant
- ❖ 4.5V Drive Low Source-Source On-State Resistance
- ❖ Gate Resistor Installed Common-Drain Type MOSFET

Application

- ❖ Lithium-Ion Secondary Battery Protection Circuits

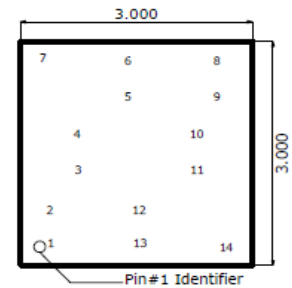
Equivalent circuit



Pin Assignment

Top View

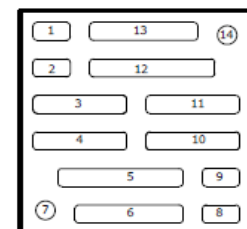
Unit: mm



Front View



Bottom View

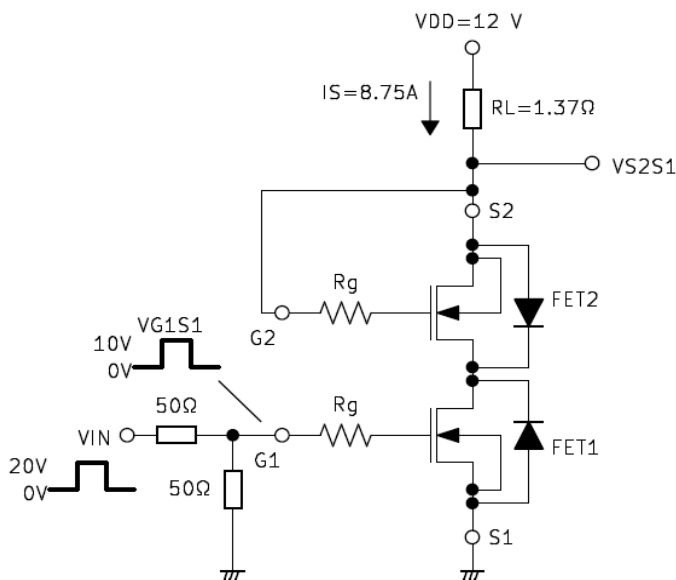


Electrical characteristics (Ta=25°C ± 3°C)

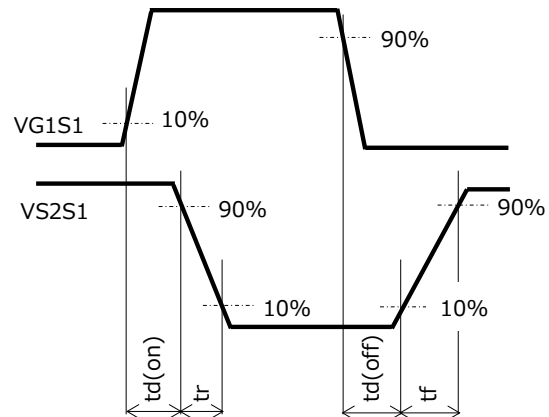
Parameter	Symbol	Conditions	Min	Typ	Max	Unit
Source-Source Breakdown Voltage	VSSS	IS=1mA, VGS=0V	24			V
Zero Gate Voltage Source Current	ISSS	VSS=24V, VGS=0V			1.0	μA
Gate-Source Leakage Current	IGSS1	VGS=±20V, VSS=0V			±10	μA
Gate-Source Leakage Current	IGSS2	VGS=±8V, VSS=0V			±1	μA
Gate-Source Threshold Voltage	Vth	VSS=10V, IS=1.0mA	1	2	3	V
Source-Source On-State Resistance	RSS(on)1	IS=8.75A, VGS=10V	0.80	1.40	1.85	mΩ
	RSS(on)2	IS=8.75A, VGS=8.0V	0.90	1.55	2.35	
	RSS(on)3	IS=8.75A, VGS=4.5V	1.30	2.30	5.10	
Body Diode Forward Voltage	VF(S-S)	IF=8.75A, VGS=0V		0.74	1.0	V
Input Capacitance *1	Ciss	VSS=10V, VGS=0V, f=1kHz		3360		pF
Output Capacitance *1	Coss			1650		
Reverse Transfer Capacitance *1	Crss			105		
Turn-On Delay Time *1 *2	td(on)	VDD=12V, VGS=0 to 10V,		0.3		μs
Rise Time *1 *2	tr	IS=8.75A		0.5		
Turn-Off Delay Time *1 *2	td(off)	VDD=12V, VGS=10 to 0V,		1.5		μs
Fall Time *1 *2	tf	IS=8.75A		0.6		
Total Gate Charge *1	Qg	VDD=12V, VGS=0 to 10V,		46		nC
Gate-Source Charge *1	Qgs			10		
Gate-Drain Charge *1	Qgd			7		
Gate Resistance *1	Rg	f=1MHz		265		Ω

Note *1 Guaranteed by Design

Note *2 Measurement Circuit for Switching Characteristics

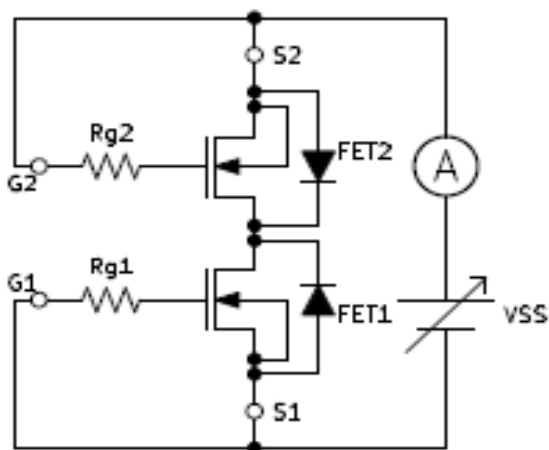
**FET1 Measurement Circuit for Switching Characteristics td(on), tr, td(off), tf
FET2: Gate-Source Short**


(Definition of Switching Measurement Detection)

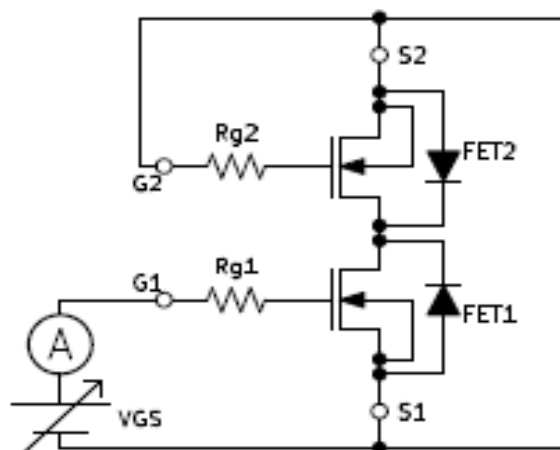


Test Circuit for FET1

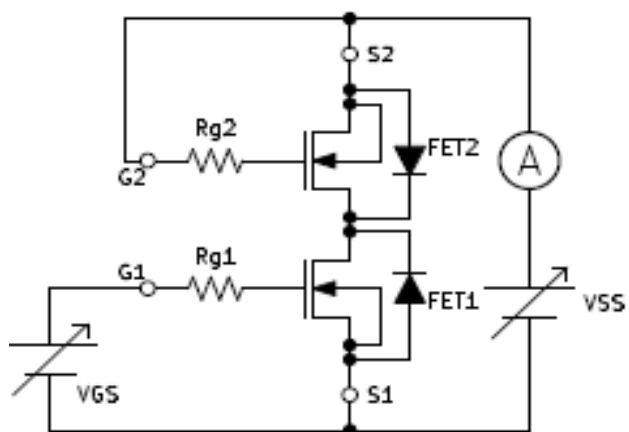
Test Circuit 1
VSSS/ISS



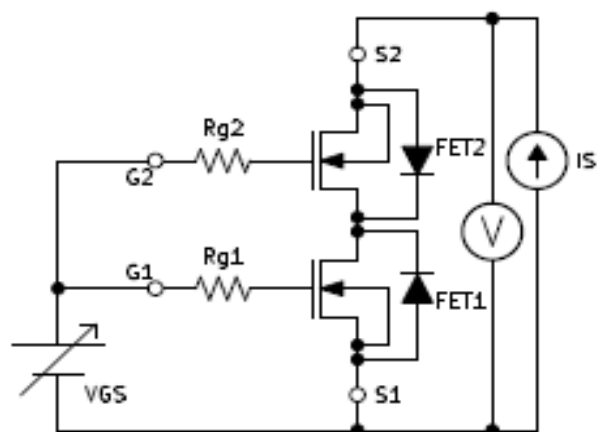
Test Circuit 2
IGSS1/2



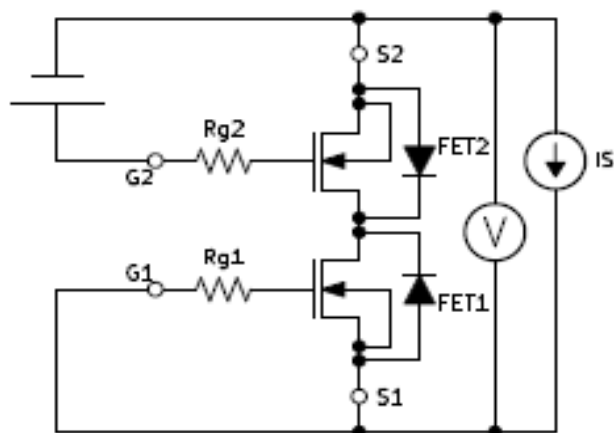
Test Circuit 3
 V_{th}

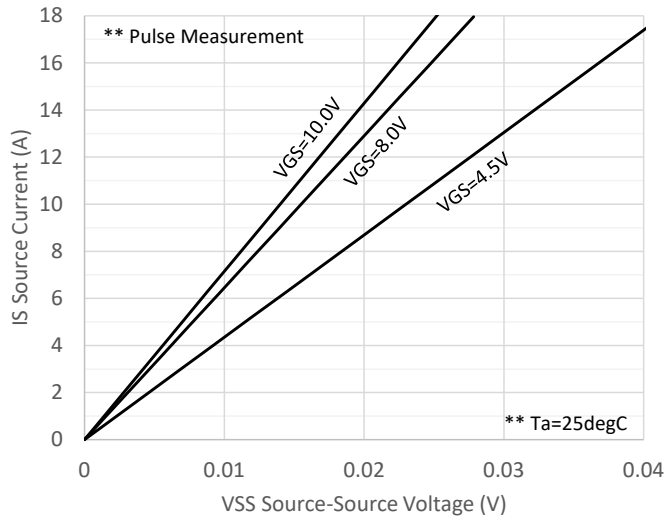
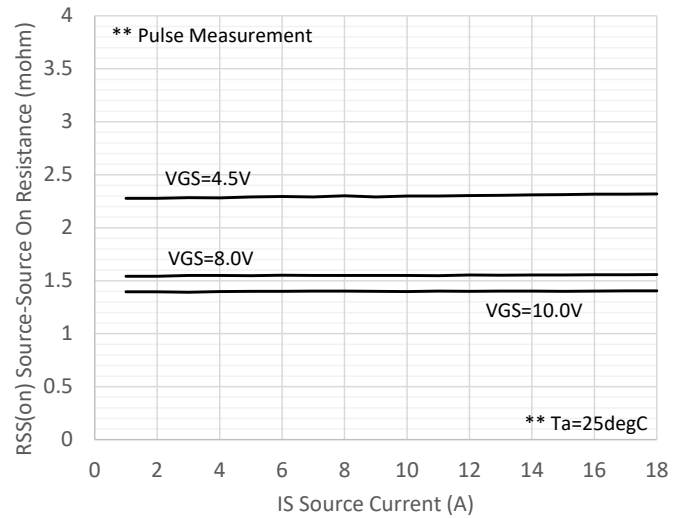
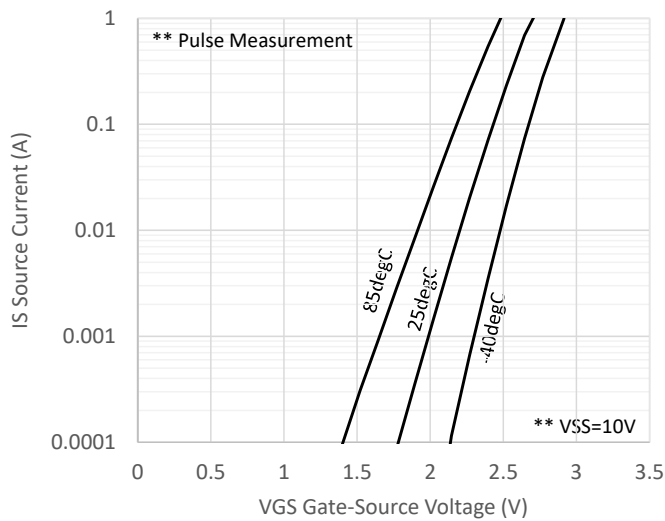
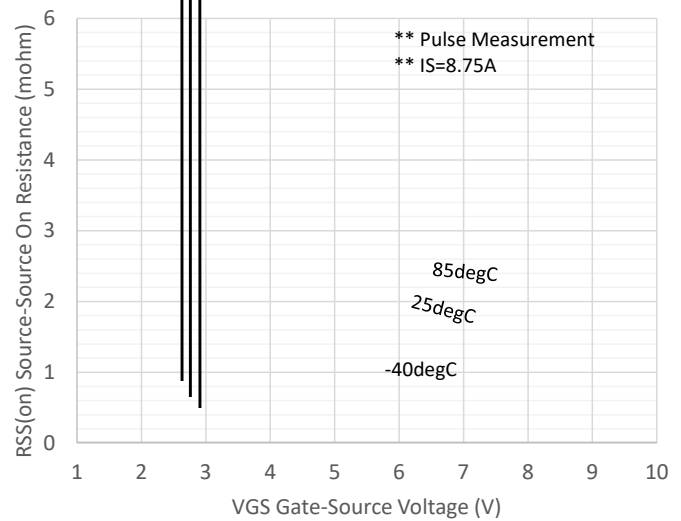


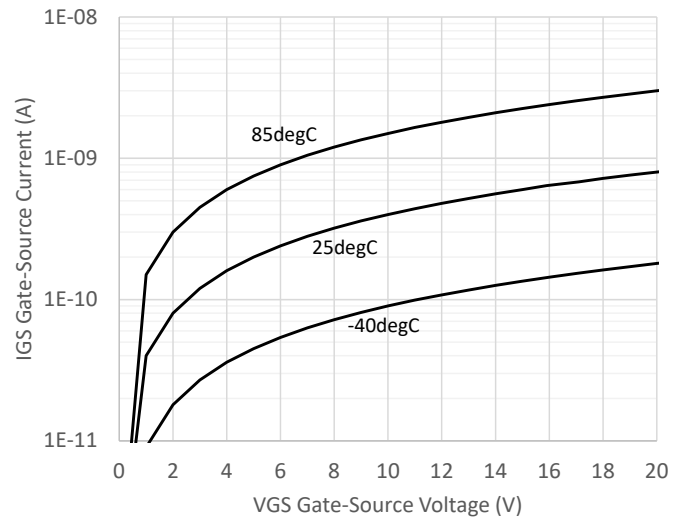
Test Circuit 4
 $R_{SS(on)}$



Test Circuit 5
 $V_F(S-S)$

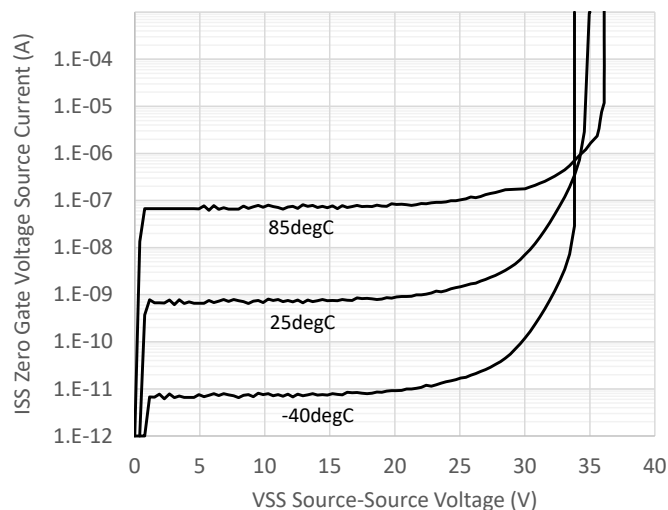


Technical data
IS to VSS

RSS(on) to IS

IS to VGS

RSS(on) to VGS

IF to VF

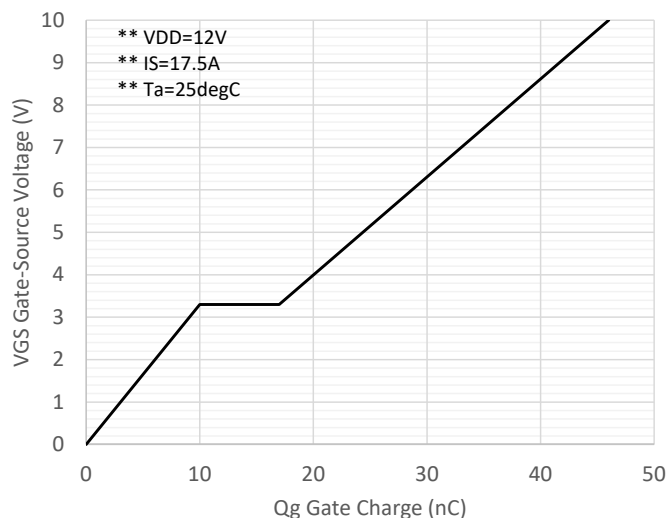
IGS to VGS


Technical data

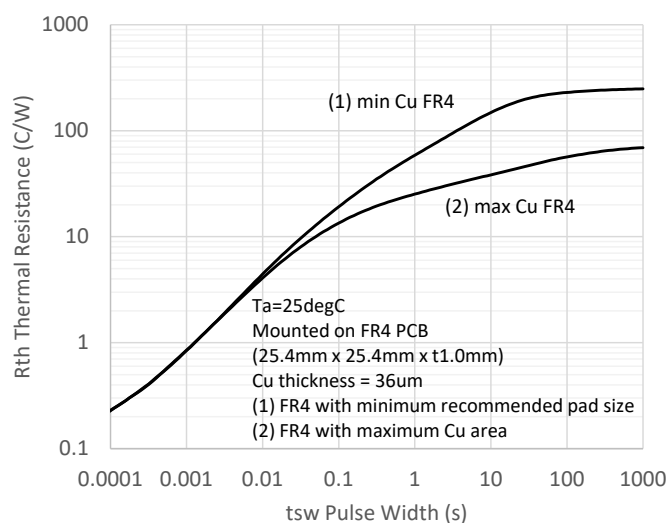
ISS to VSS



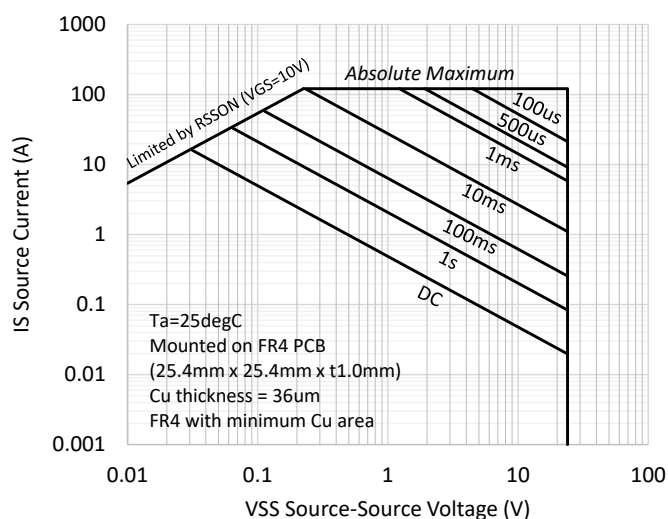
Dynamic Input / Output Characteristics



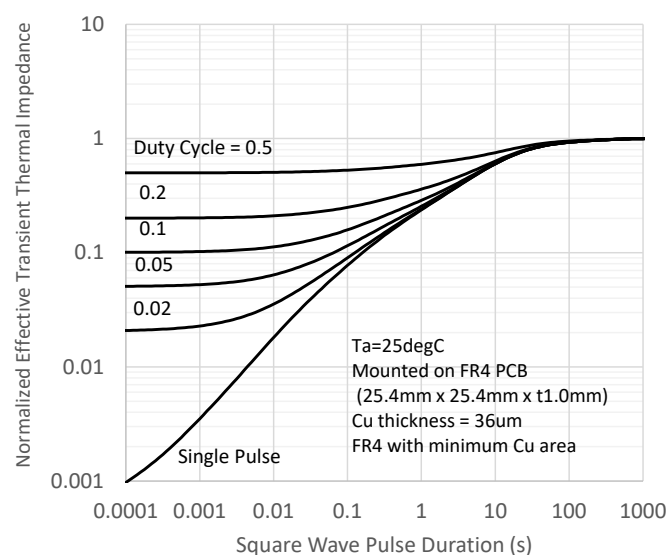
Rth to tsw



Safe Operating Area

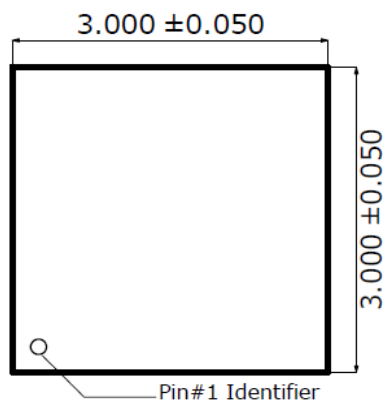


Thermal Response



Package outline dimensions

Top View

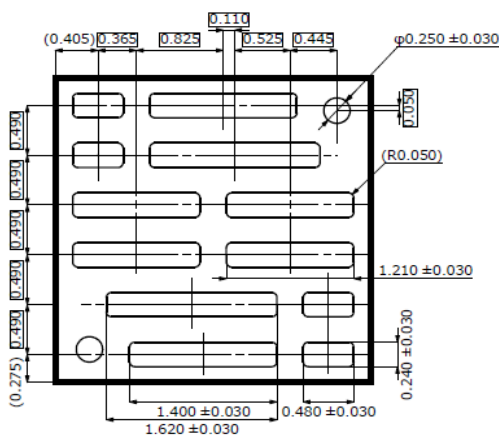


Unit: mm

Front View



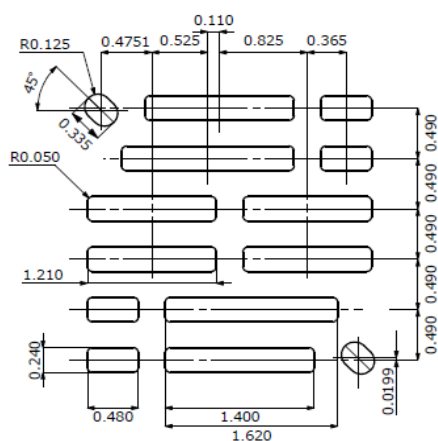
Bottom View



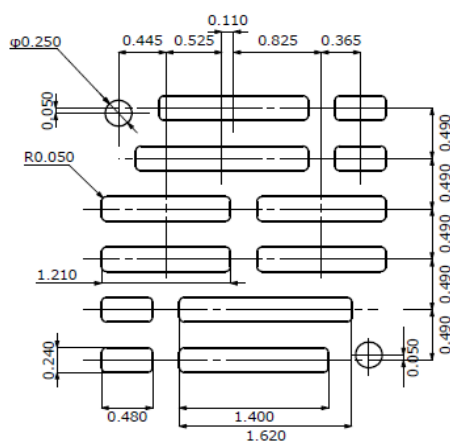
(Reference) Board Land and Stencil Mask Pattern

Unit: mm

Land



Stencil



Tape & Reel Embossed Type: 8,000pcs / reel Tape
Width: 8mm, Pitch: 4mm, Reel Size: 7inch

[illegible]

A diagram of a 10-pin connector. It consists of a horizontal row of 10 circular pins. Below the pins are 10 square boxes. The first two boxes have a small black square in their bottom-left corner, with an arrow pointing to it from the text "1 pin mark" below. The remaining eight boxes each contain a small circle in the center.

Tape end

COMPONENTS TAPE (ORIENTATION IN POCKET)

Leader part

TRAILER TAPE (300mm MIN.)

LEADER TAPE (500mm MIN.)

Feeding Direction

Important Notice

The information given in this document shall be for illustrative purposes only and shall in no event be regarded as a guarantee of conditions or characteristics. Gostone reserves the right to change any information herein. With respect to any examples, hints or any typical values stated herein and/or any information regarding the application of the product, Gostone or its affiliates hereby make no representation or warranty of any kind, expressed or implied, as to any information provided hereunder, including without limitation as to the accuracy, completeness or non-infringement of intellectual property rights of any third party, and they assume no liability for the consequences of use of such information. In addition, any information given in this document is subject to customer's compliance with its obligations stated herein and any applicable legal requirements, norms and standards concerning customer's products and any use of the product of Gostone in customer's applications. The information contained herein is exclusively intended for technically trained staff. No license is granted by implication under any patent right, copyright, mask work right, or other intellectual property right. It is customer's sole responsibility to evaluate the suitability of the product for the intended application and the completeness of the product information given herein with respect to such application. In no event shall Gostone or its affiliates be liable to any party for any direct, indirect, special, punitive, incidental or consequential damages of any nature whatsoever, including but not limited to loss of profits and loss of goodwill, whether or not such damages are based on tort or negligence, warranty, breach of contract or any other legal theory. In addition, any recipient of this document and the relevant products samples may not alter, decompile, disassemble, reverse engineer, or otherwise modify any information/samples received hereunder. Any intellectual property rights arising from the reverse engineering of Gostone's products shall belong to Gostone.