Ordering number : ENA1141D

SANYO Semiconductors

DATA SHEET

An ON Semiconductor Company

N-Channel Silicon MOSFETs

EMH2407 — General-Purpose Switching Device Applications

Features

- Low ON-resistance
- Best suited for LiB charging and discharging switch
- Common-drain type
- 2.5V drive
- Protection diode in

Specifications

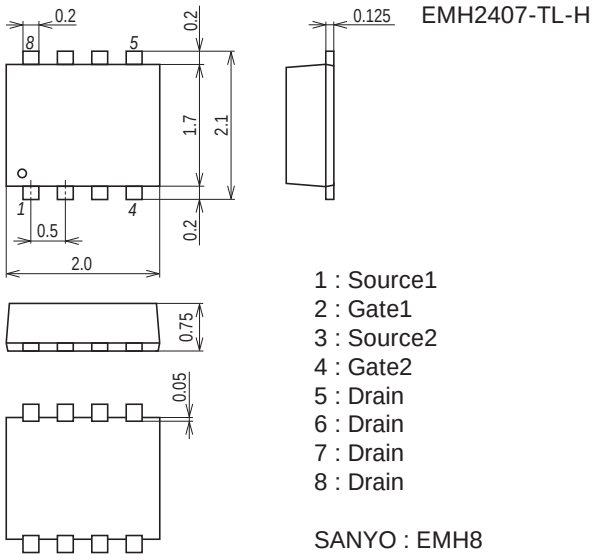
Absolute Maximum Ratings at Ta=25°C

Parameter	Symbol	Conditions	Ratings	Unit
Drain-to-Source Voltage	V_{DSS}		20	V
Gate-to-Source Voltage	V_{GSS}		±12	V
Drain Current (DC)	I_D		6	A
Drain Current (Pulse)	I_{DP}	PW≤10μs, duty cycle≤1%	40	A
Allowable Power Dissipation	P_D	When mounted on ceramic substrate (900mm^2×0.8mm) 1unit	1.3	W
Total Dissipation	P_T	When mounted on ceramic substrate (900mm^2×0.8mm)	1.4	W
Channel Temperature	Tch		150	°C
Storage Temperature	Tstg		−55 to +150	°C

Package Dimensions

unit : mm (typ)

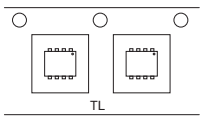
7045-006



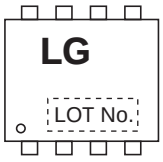
Product & Package Information

- Package : EMH8
- JEITA, JEDEC : -
- Minimum Packing Quantity : 3,000 pcs./reel

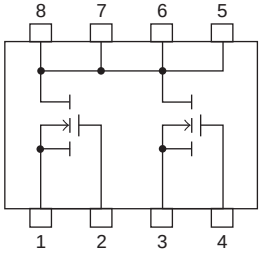
Packing Type : TL



Marking



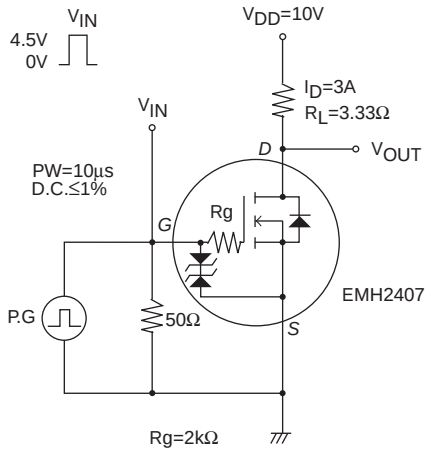
Electrical Connection



Electrical Characteristics at Ta=25°C

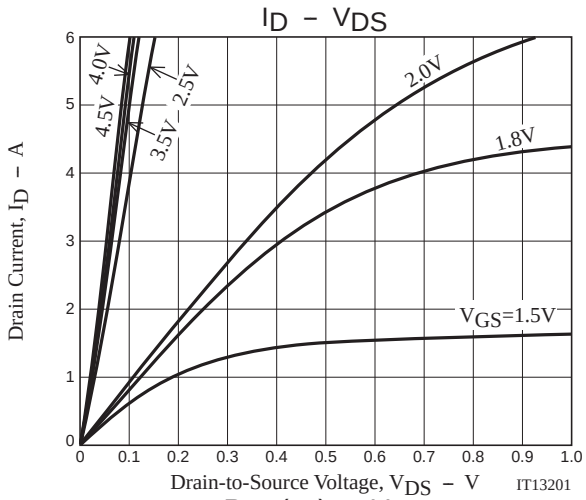
Parameter	Symbol	Conditions	Ratings			Unit
			min	typ	max	
Drain-to-Source Breakdown Voltage	$V_{(BR)DSS}$	I_D=1mA, V_{GS}=0V	20			V
Zero-Gate Voltage Drain Current	I_{DSS}	V_{DS}=20V, V_{GS}=0V			1	μA
Gate-to-Source Leakage Current	I_{GSS}	V_{GS}=±8V, V_{DS}=0V			±10	μA
Cutoff Voltage	V_{GS}(off)	V_{DS}=10V, I_D=1mA	0.5		1.3	V
Forward Transfer Admittance	| yfs |	V_{DS}=10V, I_D=3A	3	5		S
Static Drain-to-Source On-State Resistance	R_{DS}(on)1	I_D=3A, V_{GS}=4.5V	13	19	25	mΩ
	R_{DS}(on)2	I_D=3A, V_{GS}=4V	14	20	26	mΩ
	R_{DS}(on)3	I_D=1.5A, V_{GS}=2.5V	16	28	39	mΩ
Input Capacitance	Ciss	V_{DS}=10V, f=1MHz		580		pF
Output Capacitance	Coss			95		pF
Reverse Transfer Capacitance	Crss			75		pF
Turn-ON Delay Time	t_{d}(on)	See specified Test Circuit.		310		ns
Rise Time	t_r			1020		ns
Turn-OFF Delay Time	t_{d}(off)			3000		ns
Fall Time	t_f			2250		ns
Total Gate Charge	Qg	V_{DS}=10V, V_{GS}=4.5V, I_D=6A		6.3		nC
Gate-to-Source Charge	Qgs			0.83		nC
Gate-to-Drain “Miller” Charge	Qgd			1.9		nC
Diode Forward Voltage	V_{SD}	I_S=6A, V_{GS}=0V		0.78	1.2	V

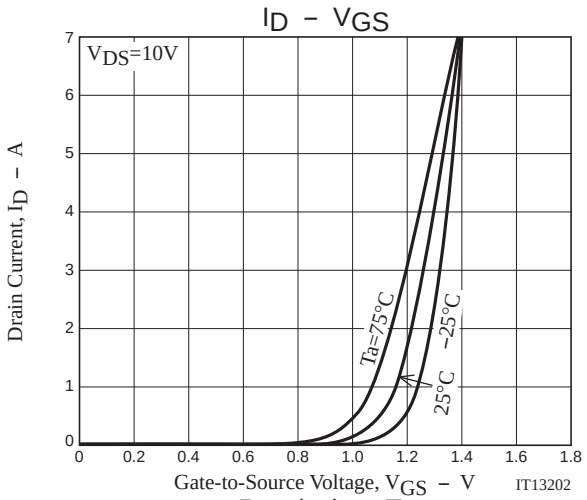
Switching Time Test Circuit

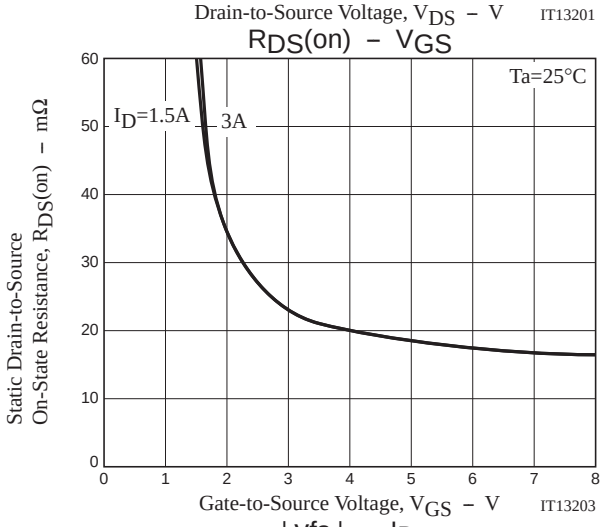


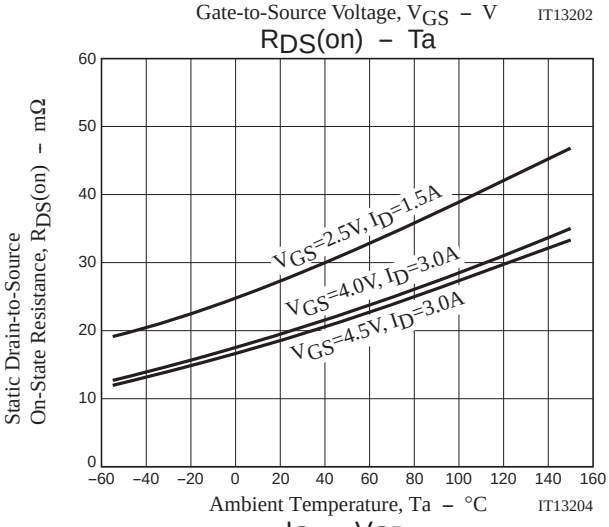
Ordering Information

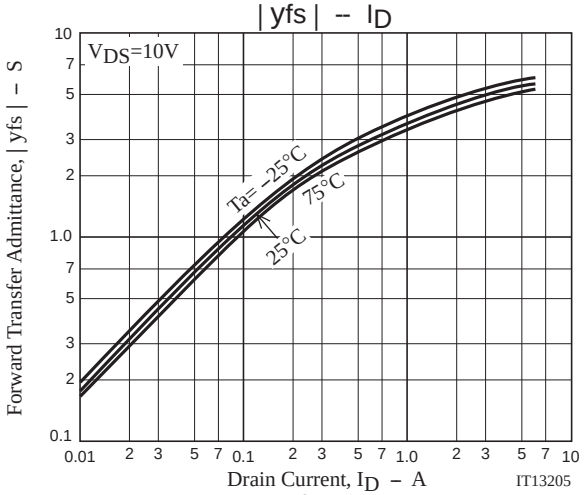
Device	Package	Shipping	memo
EMH2407-TL-H	EMH8	3,000pcs./reel	Pb Free and Halogen Free

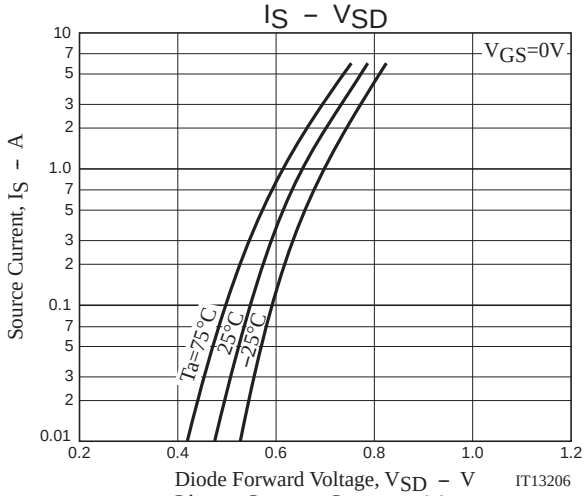

ID – VDS
Drain Current, ID – A
Drain-to-Source Voltage, VDS – V
IT13201
4.0V
4.5V
3.5V
2.5V
2.0V
1.8V
VGS=1.5V

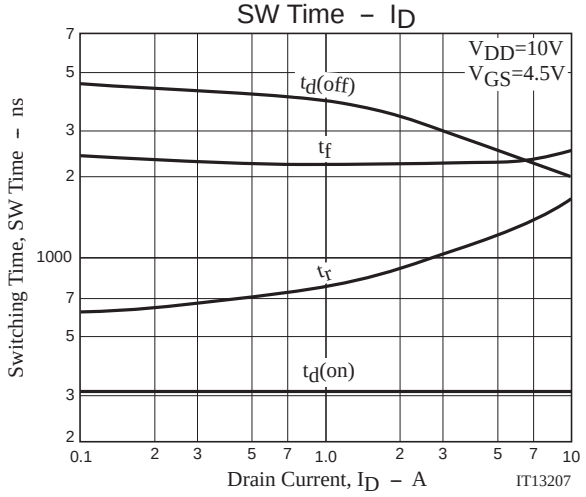

ID – VGS
Drain Current, ID – A
Gate-to-Source Voltage, VGS – V
IT13202
VDS=10V
Ta=75°C
25°C
–25°C

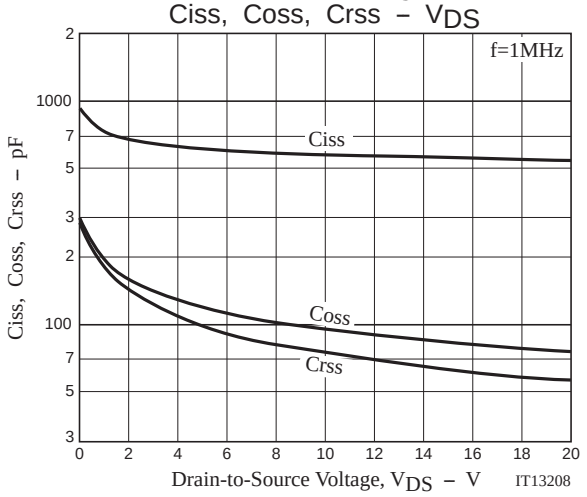

RDS(on) – VGS
Static Drain-to-Source On-State Resistance, RDS(on) – mΩ
Gate-to-Source Voltage, VGS – V
IT13203
Ta=25°C
ID=1.5A
3A

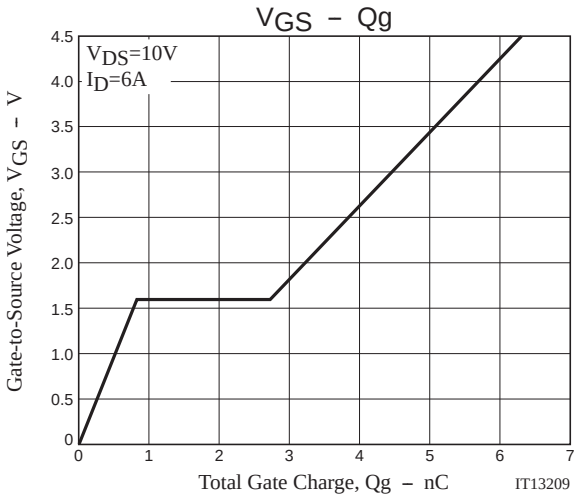

RDS(on) – Ta
Static Drain-to-Source On-State Resistance, RDS(on) – mΩ
Ambient Temperature, Ta – °C
IT13204
VGS=2.5V, ID=1.5A
VGS=4.0V, ID=3.0A
VGS=4.5V, ID=3.0A

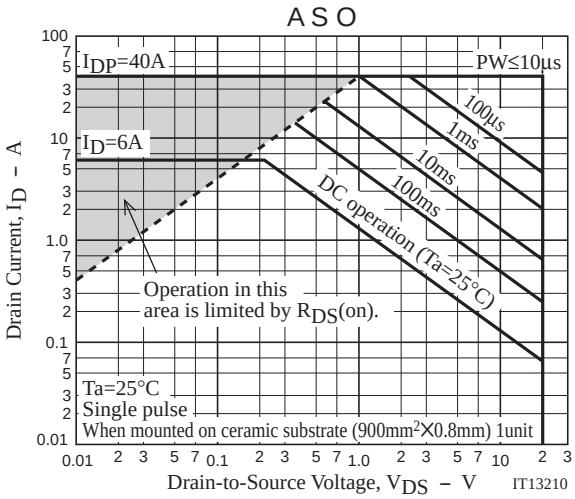

| yfs | – ID
Forward Transfer Admittance, | yfs | – S
Drain Current, ID – A
IT13205
VDS=10V
Ta=–25°C
75°C
25°C

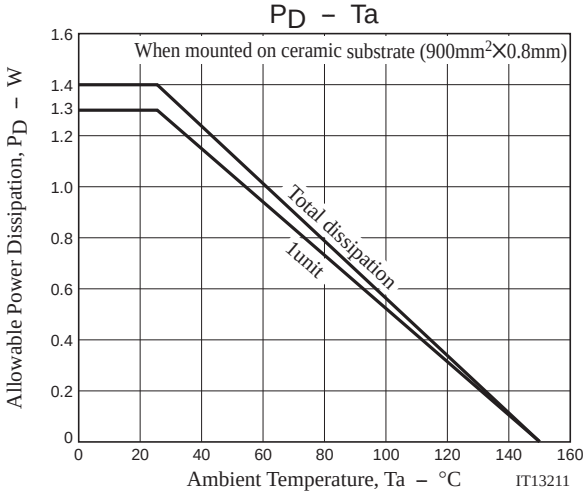

IS – VSD
Source Current, IS – A
Diode Forward Voltage, VSD – V
IT13206
VGS=0V
Ta=75°C
25°C
–25°C


SW Time – ID
Switching Time, SW Time – ns
Drain Current, ID – A
IT13207
VDD=10V
VGS=4.5V
td(off)
tf
tr
td(on)


Ciss, Coss, Crss – VDS
Ciss, Coss, Crss – pF
Drain-to-Source Voltage, VDS – V
IT13208
f=1MHz
Ciss
Coss
Crss


VGS – Qg
VDS=10V
ID=6A
Gate-to-Source Voltage, VGS – V
Total Gate Charge, Qg – nC
IT13209


A S O
IDP=40A
PW≤10μs
ID=6A
100μs
1ms
10ms
100ms
DC operation (Ta=25°C)
Operation in this
area is limited by RDS(on).
Ta=25°C
Single pulse
When mounted on ceramic substrate (900mm2×0.8mm) 1unit
Drain Current, ID – A
Drain-to-Source Voltage, VDS – V
IT13210


PD – Ta
When mounted on ceramic substrate (900mm2×0.8mm)
Total dissipation
1unit
Allowable Power Dissipation, PD – W
Ambient Temperature, Ta – °C
IT13211

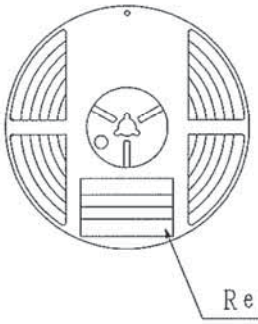
Embossed Taping Specification

EMH2407-TL-H

1. Packing Format

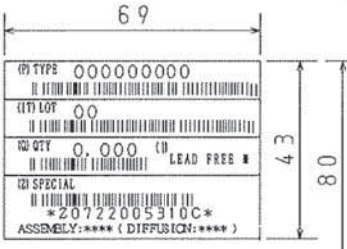
Package Name	Carrier Tape Type	Maximum Number of devices contained (pcs)			Packing format	
		Reel	Inner box	Outer box	Inner BOX (C-1)	Outer BOX (A-7)
EMH8	MCP4	3,000	15,000	90,000	5 reels contained Dimensions:mm (external) 183×72×185	6 inner boxes contained Dimensions:mm (external) 440×195×210

Packing method



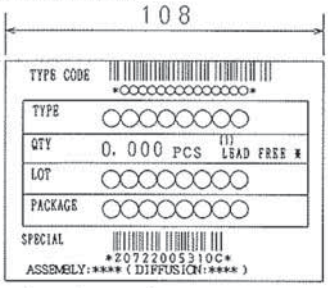
Reel label, Inner box label

(unit:mm)



Outer box label

It is a label at the time of factory shipments. The form of a label may change in physical distribution process.



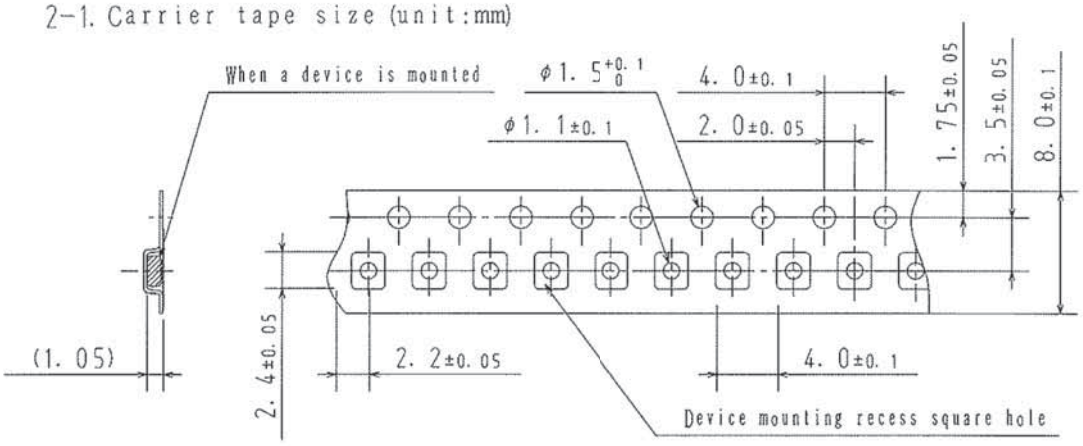
NOTE (1)

The LEAD FREE ※ description shows that the surface treatment of the terminal is lead free.

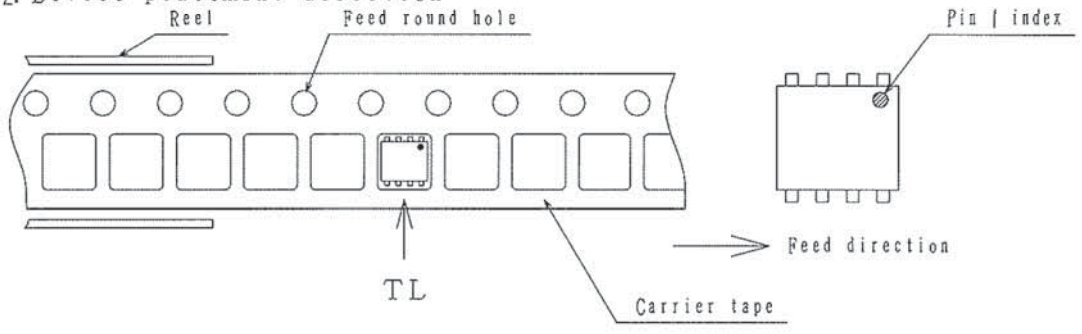
Label	JEITA Phase
LEAD FREE 3	JEITA Phase 3A
LEAD FREE 4	JEITA Phase 3

2. Taping configuration

2-1. Carrier tape size (unit:mm)



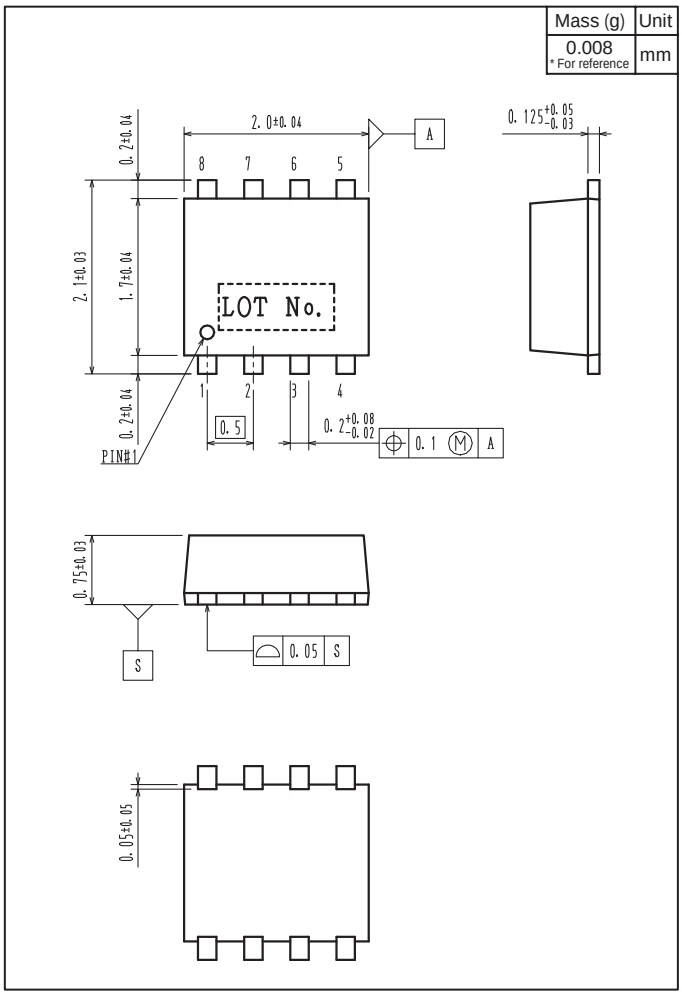
2-2. Device placement direction



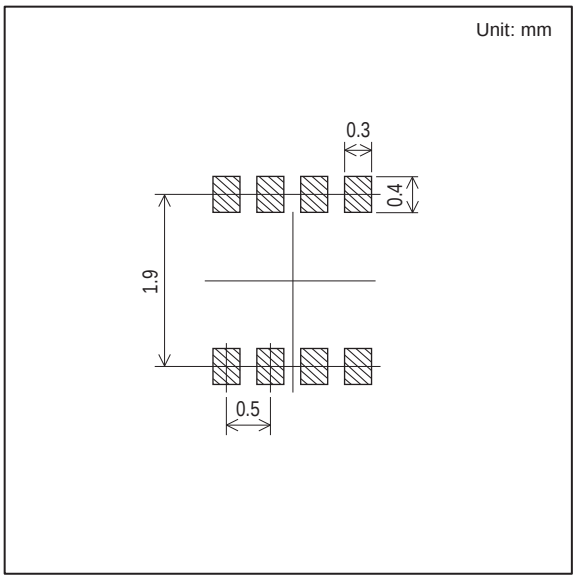
Those with pin 1 index on the feed hole side·····TL

Outline Drawing

EMH2407-TL-H



Land Pattern Example



Note on usage : Since the EMH2407 is a MOSFET product, please avoid using this device in the vicinity of highly charged objects.

This catalog provides information as of September, 2012. Specifications and information herein are subject to change without notice.