Ordering number : ENA1890A

EMH2409

N-Channel Power MOSFET
30V, 4A, 59mΩ, Dual EMH8

ON Semiconductor®
http://onsemi.com

Features

- The EMH2409 incorporates a N-channel MOSFET that feature low ON-resistance and ultrahigh-speed switching, thereby enabling high-density mounting
- 4V drive
- Halogen free compliance
- Protection diode in

Specifications

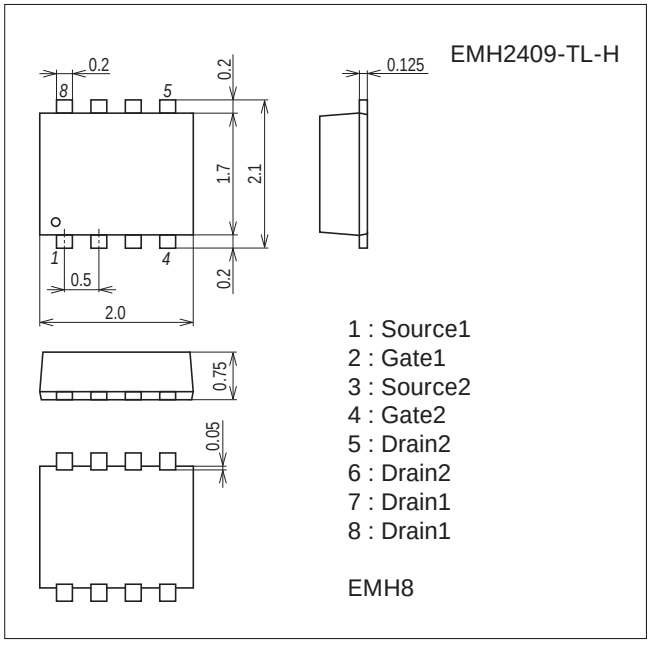
Absolute Maximum Ratings at Ta=25°C

Parameter	Symbol	Conditions	Ratings	Unit
Drain-to-Source Voltage	V_{DSS}		30	V
Gate-to-Source Voltage	V_{GSS}		±20	V
Drain Current (DC)	I_D		4	A
Drain Current (Pulse)	I_{DP}	PW≤10μs, duty cycle≤1%	16	A
Allowable Power Dissipation	P_D	When mounted on ceramic substrate (900mm^2×0.8mm) 1unit	1.0	W
Total Dissipation	P_T	When mounted on ceramic substrate (900mm^2×0.8mm)	1.2	W
Channel Temperature	Tch		150	°C
Storage Temperature	Tstg		−55 to +150	°C

Stresses exceeding Maximum Ratings may damage the device. Maximum Ratings are stress ratings only. Functional operation above the Recommended Operating Conditions is not implied. Extended exposure to stresses above the Recommended Operating Conditions may affect device reliability.

Package Dimensions

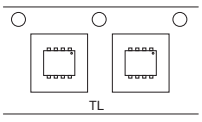
unit : mm (typ)
7045-006



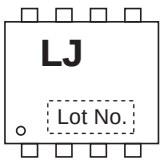
Product & Package Information

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

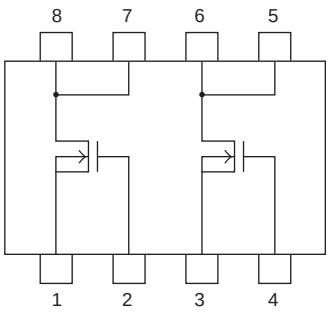
Packing Type : TL



Marking



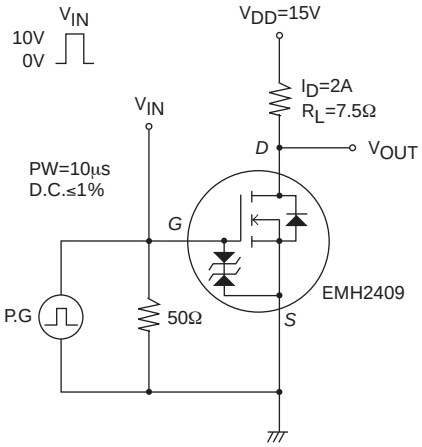
Electrical Connection



Electrical Characteristics at Ta=25°C

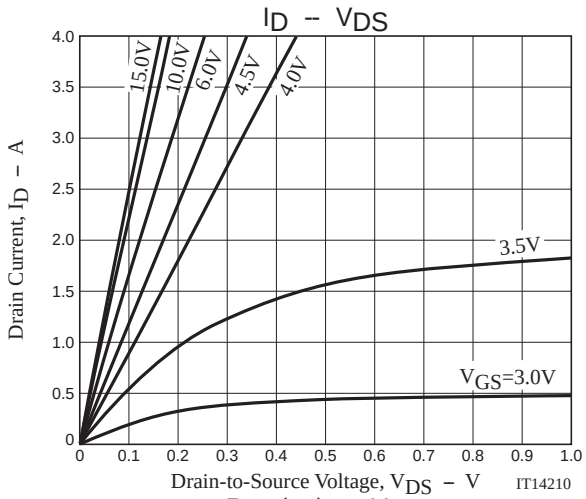
Parameter	Symbol	Conditions	Ratings			Unit
			min	typ	max	
Drain-to-Source Breakdown Voltage	$V_{(BR)DSS}$	I_D=1mA, V_{GS}=0V	30			V
Zero-Gate Voltage Drain Current	I_{DSS}	V_{DS}=30V, V_{GS}=0V			1	μA
Gate-to-Source Leakage Current	I_{GSS}	V_{GS}=±16V, V_{DS}=0V			±10	μA
Cutoff Voltage	V_{GS}(off)	V_{DS}=10V, I_D=1mA	1.2		2.6	V
Forward Transfer Admittance	| yfs |	V_{DS}=10V, I_D=2A		1.66		S
Static Drain-to-Source On-State Resistance	R_{DS}(on)1	I_D=2A, V_{GS}=10V		45	59	mΩ
	R_{DS}(on)2	I_D=1A, V_{GS}=4.5V		85	119	mΩ
	R_{DS}(on)3	I_D=1A, V_{GS}=4V		110	155	mΩ
Input Capacitance	Ciss	V_{DS}=10V, f=1MHz		240		pF
Output Capacitance	Coss			45		pF
Reverse Transfer Capacitance	Crss			30		pF
Turn-ON Delay Time	t_d(on)	See specified Test Circuit.		6.2		ns
Rise Time	t_r			11		ns
Turn-OFF Delay Time	t_d(off)			17		ns
Fall Time	t_f			7.5		ns
Total Gate Charge	Qg	V_{DS}=15V, V_{GS}=10V, I_D=4A		4.4		nC
Gate-to-Source Charge	Qgs			1.1		nC
Gate-to-Drain “Miller” Charge	Qgd			0.64		nC
Diode Forward Voltage	V_{SD}	I_S=4A, V_{GS}=0V		0.82	1.2	V

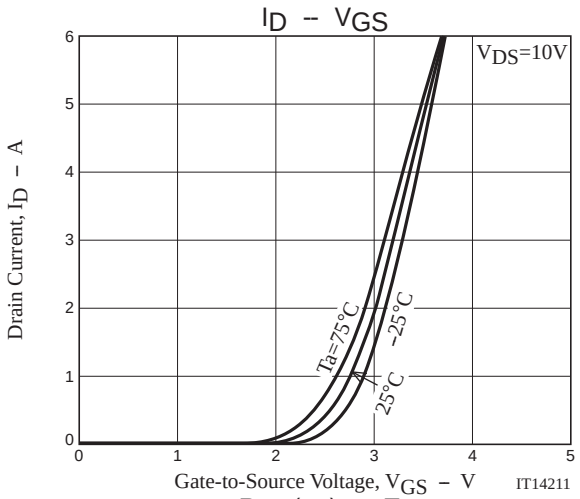
Switching Time Test Circuit

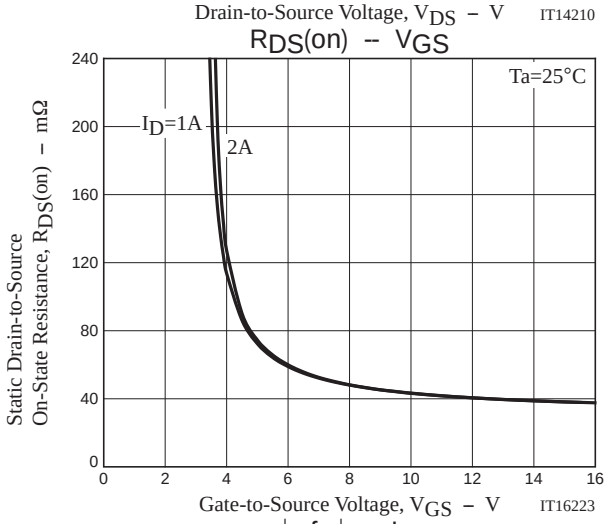


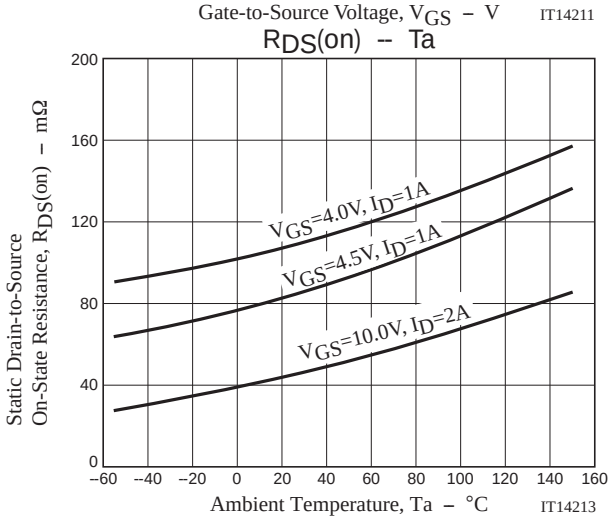
Ordering Information

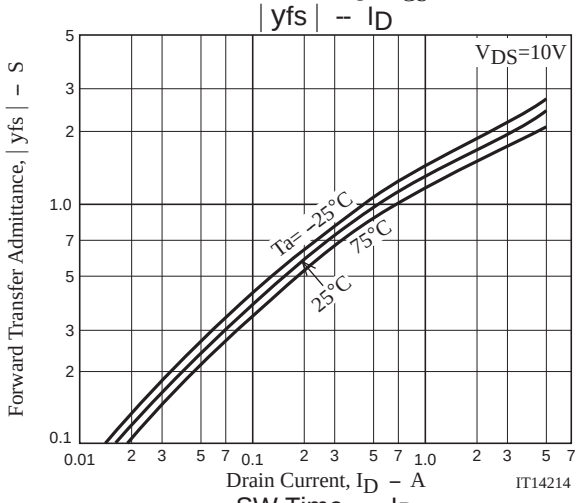
Device	Package	Shipping	memo
EMH2409-TL-H	EMH8	3,000pcs./reel	Pb Free and Halogen Free

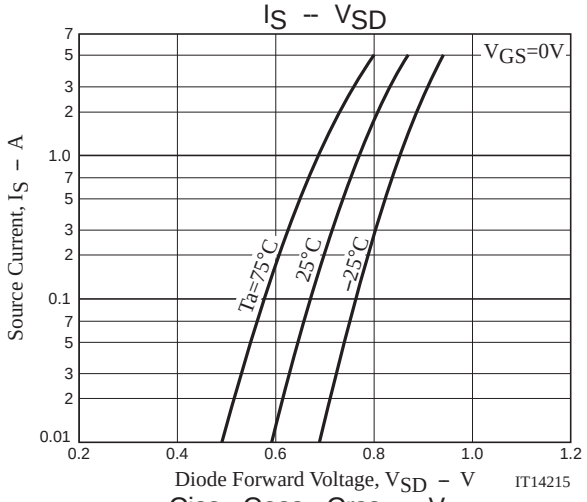

ID -- VDS
Drain Current, ID – A
15.0V
10.0V
6.0V
4.5V
4.0V
3.5V
VGS=3.0V
Drain-to-Source Voltage, VDS – V
IT14210

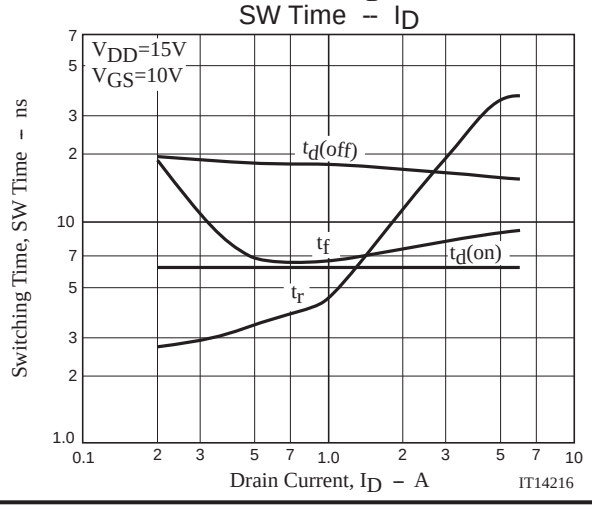

ID -- VGS
VDS=10V
Drain Current, ID – A
Ta=75°C
25°C
–25°C
Gate-to-Source Voltage, VGS – V
IT14211

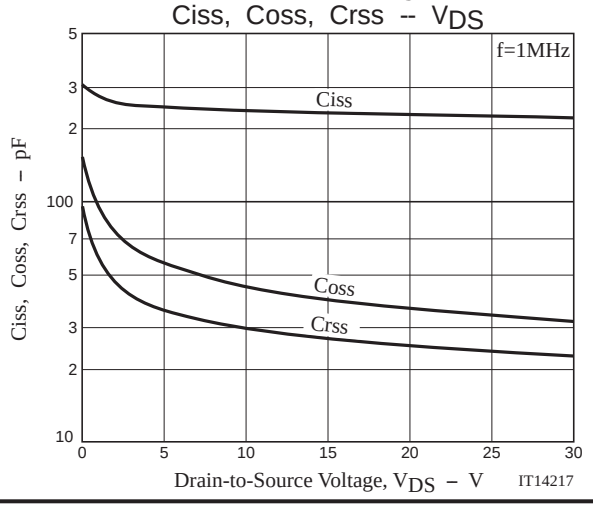

RDS(on) -- VGS
Ta=25°C
ID=1A
2A
Static Drain-to-Source On-State Resistance, RDS(on) – mΩ
Gate-to-Source Voltage, VGS – V
IT16223

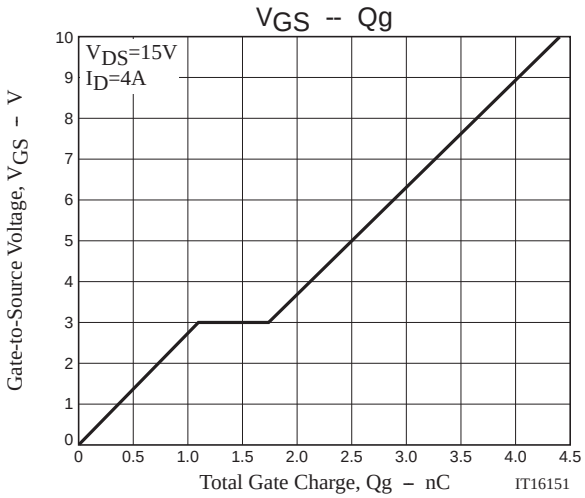

RDS(on) -- Ta
VGS=4.0V, ID=1A
VGS=4.5V, ID=1A
VGS=10.0V, ID=2A
Static Drain-to-Source On-State Resistance, RDS(on) – mΩ
Ambient Temperature, Ta – °C
IT14213

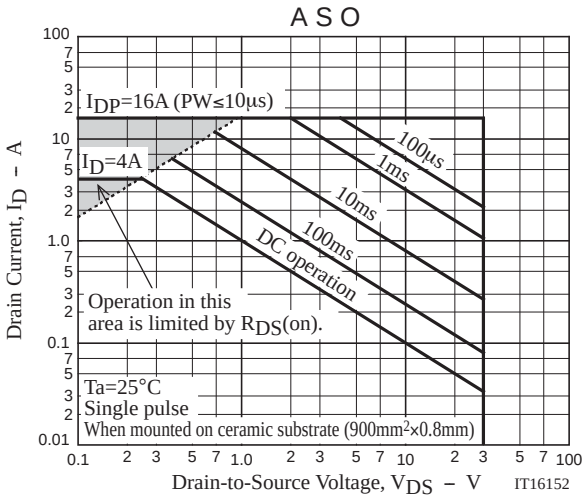

| yfs | -- ID
VDS=10V
Ta= –25°C
75°C
25°C
Forward Transfer Admittance, | yfs | – S
Drain Current, ID – A
IT14214

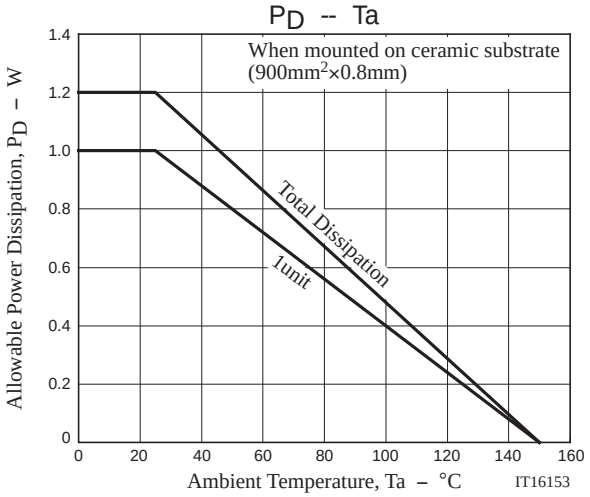

IS -- VSD
VGS=0V
Ta=75°C
25°C
–25°C
Source Current, IS – A
Diode Forward Voltage, VSD – V
IT14215


SW Time -- ID
VDD=15V
VGS=10V
td(off)
tf
td(on)
tr
Switching Time, SW Time – ns
Drain Current, ID – A
IT14216


Ciss, Coss, Crss -- VDS
f=1MHz
Ciss
Coss
Crss
Ciss, Coss, Crss – pF
Drain-to-Source Voltage, VDS – V
IT14217


VGS -- Qg
VDS=15V
ID=4A
Gate-to-Source Voltage, VGS – V
Total Gate Charge, Qg – nC
IT16151


A S O
IDP=16A (PW≤10μs)
ID=4A
100μs
1ms
10ms
100ms
DC operation
Operation in this
area is limited by RDS(on).
Ta=25°C
Single pulse
When mounted on ceramic substrate (900mm2×0.8mm)
Drain Current, ID – A
Drain-to-Source Voltage, VDS – V
IT16152


PD -- Ta
When mounted on ceramic substrate
(900mm2×0.8mm)
Total Dissipation
1unit
Allowable Power Dissipation, PD – W
Ambient Temperature, Ta – °C
IT16153

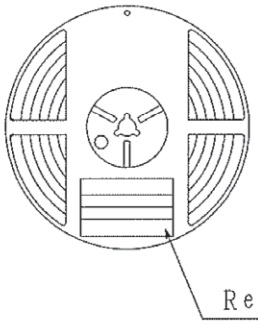
Embossed Taping Specification

EMH2409-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

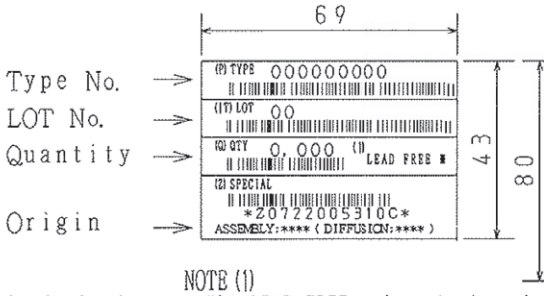
Packing method



Reel label

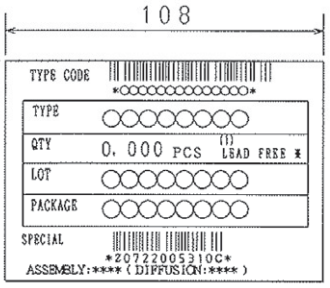
Reel label, Inner box label

(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.



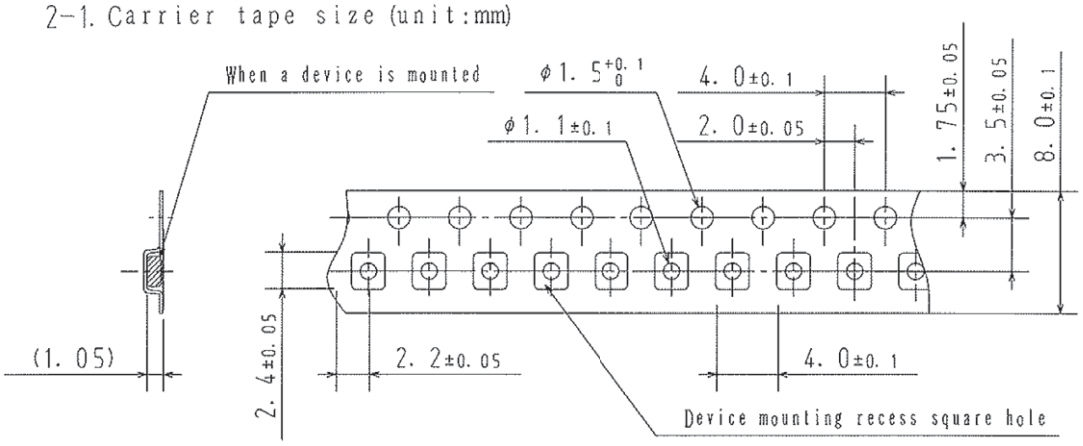
NOTE (1)

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

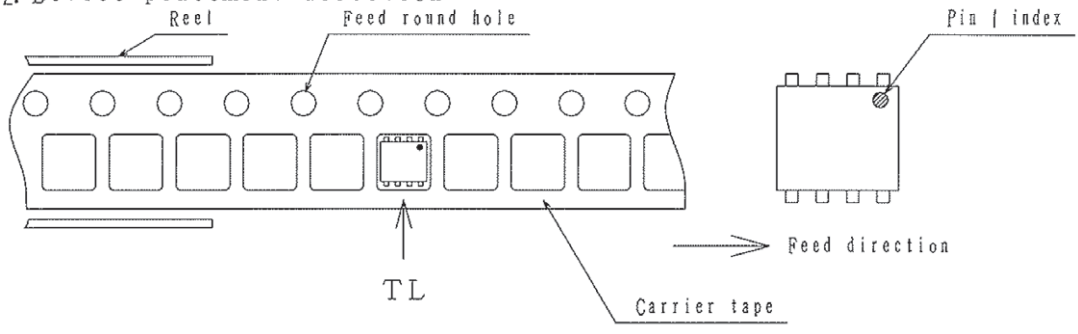
Label	JEITA Phase
LEAD FREE 3	JEITA Phase 3A
LEAD FREE 4	JEITA Phase 3

2. Taping configuration

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



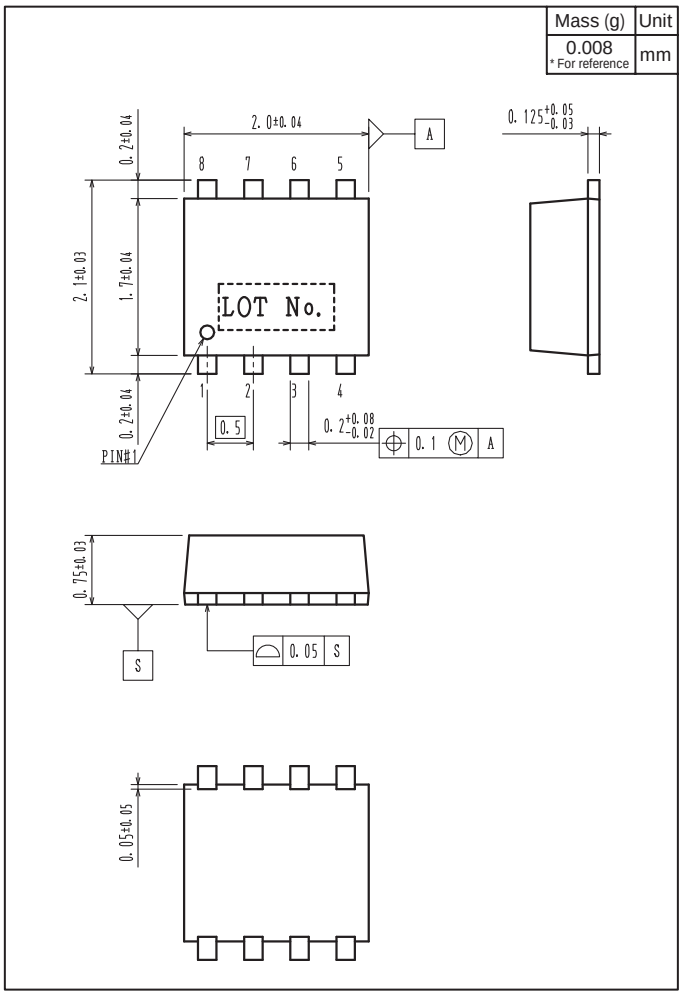
2-2. Device placement direction



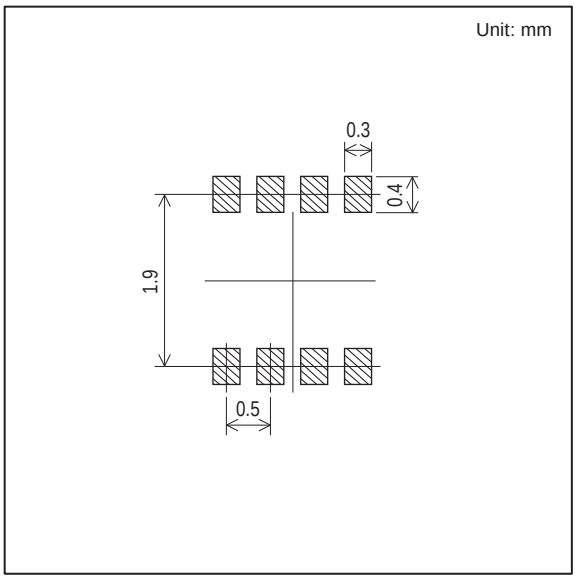
Those with pin 1 index on the feed hole side·····TL

Outline Drawing

EMH2409-TL-H



Land Pattern Example



Note on usage : Since the EMH2409 is a MOSFET product, please avoid using this device in the vicinity of highly charged objects.

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