Ordering number : ENA0661A

SANYO Semiconductors

DATA SHEET

An ON Semiconductor Company

P-Channel Silicon MOSFET

EMH1303 — General-Purpose Switching Device Applications

Features

- Low ON-resistance
- 1.8V drive
- Protection diode in

Specifications

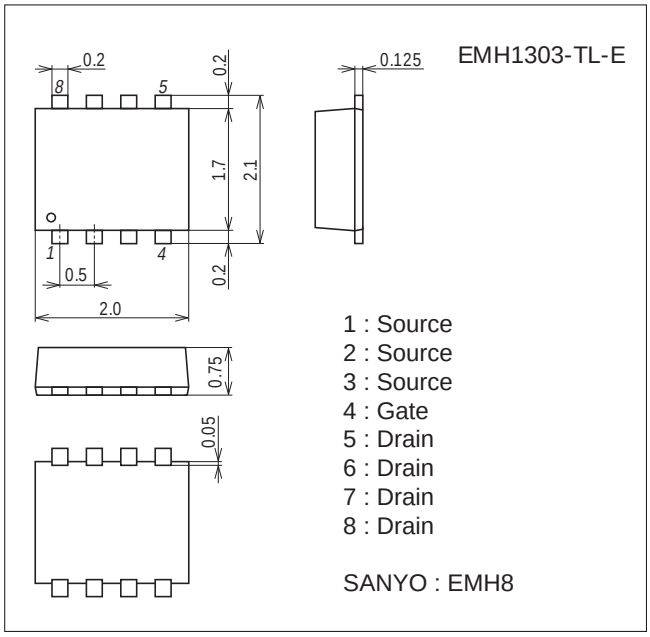
Absolute Maximum Ratings at Ta=25°C

Parameter	Symbol	Conditions	Ratings	Unit
Drain-to-Source Voltage	V_{DSS}		−12	V
Gate-to-Source Voltage	V_{GSS}		±10	V
Drain Current (DC)	I_D		−7	A
Drain Current (Pulse)	I_{DP}	PW≤10μs, duty cycle≤1%	−28	A
Allowable Power Dissipation	P_D	Mounted on a ceramic board (1200mm²×0.8mm)	1.5	W
Channel Temperature	Tch		150	℃
Storage Temperature	Tstg		−55 to +150	℃

Package Dimensions

unit : mm (typ)

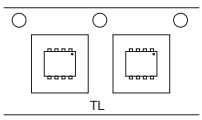
7045-001



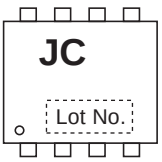
Product & Package Information

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

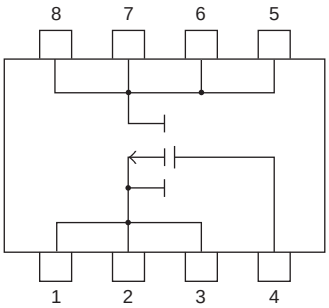
Taping Type : TL



Marking



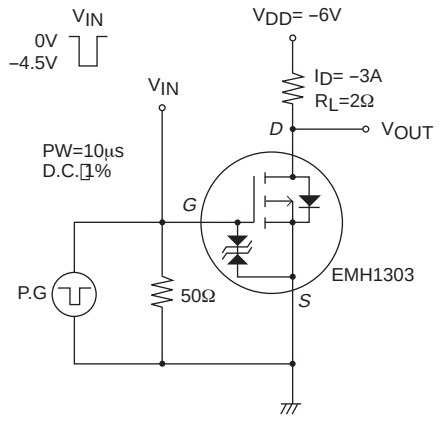
Electrical Connection



Electrical Characteristics at Ta=25°C

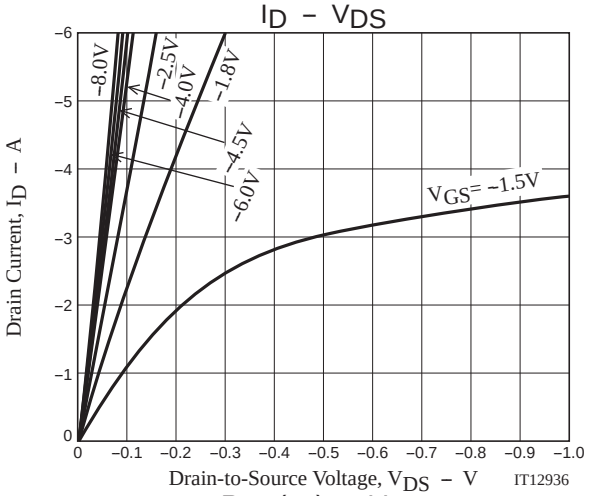
Parameter	Symbol	Conditions	Ratings			Unit
			min	typ	max	
Drain-to-Source Breakdown Voltage	$V_{(BR)DSS}$	I_D=−1mA, V_{GS}=0V	−12			V
Zero-Gate Voltage Drain Current	$I_{DSS}1$	V_{DS}=−8V, V_{GS}=0V			−1	μA
	$I_{DSS}2$	V_{DS}=−12V, V_{GS}=0V			−10	μA
Gate-to-Source Leakage Current	I_{GSS}	V_{GS}=±8V, V_{DS}=0V			±10	μA
Cutoff Voltage	V_{GS}(off)	V_{DS}=−6V, I_D=−1mA	−0.4		−1.2	V
Forward Transfer Admittance	| yfs |	V_{DS}=−6V, I_D=−3A	7.2	12		S
Static Drain-to-Source On-State Resistance	R_{DS}(on)1	I_D=−6A, V_{GS}=−4.5V		18	23	mΩ
	R_{DS}(on)2	I_D=−6A, V_{GS}=−2.5V		27	36	mΩ
	R_{DS}(on)3	I_D=−0.5A, V_{GS}=−1.8V		40	65	mΩ
Input Capacitance	Ciss	V_{DS}=−6V, f=1MHz		1100		pF
Output Capacitance	Coss			350		pF
Reverse Transfer Capacitance	Crss			265		pF
Turn-ON Delay Time	t_d(on)	See specified Test Circuit.		11		ns
Rise Time	t_r			165		ns
Turn-OFF Delay Time	t_d(off)			100		ns
Fall Time	t_f			105		ns
Total Gate Charge	Qg	V_{DS}=−6V, V_{GS}=−4.5V, I_D=−7A		12.0		nC
Gate-to-Source Charge	Qgs			1.9		nC
Gate-to-Drain “Miller” Charge	Qgd			2.9		nC
Diode Forward Voltage	V_{SD}	I_S=−7A, V_{GS}=0V		−0.8	−1.2	V

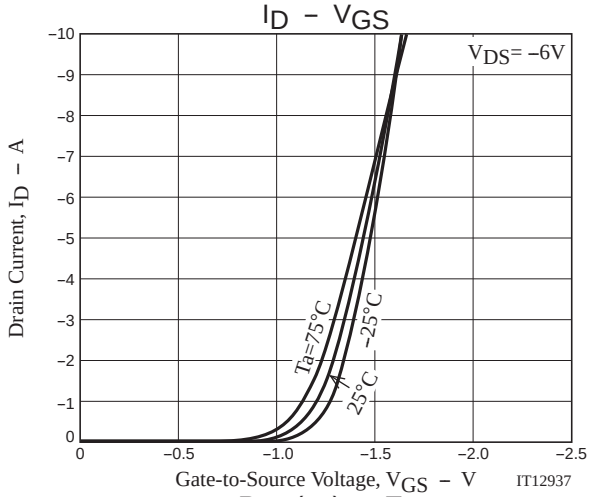
Switching Time Test Circuit

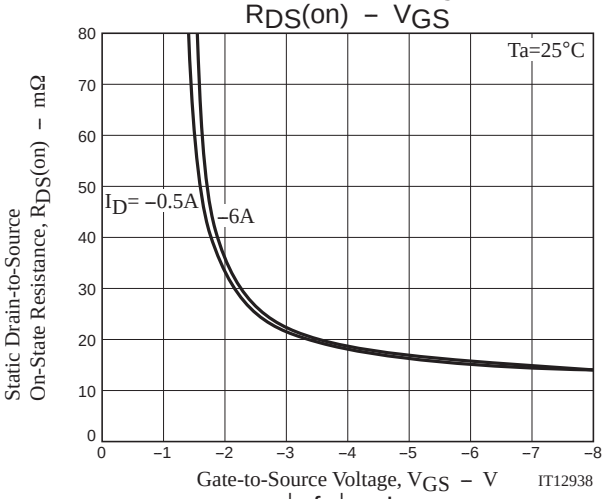


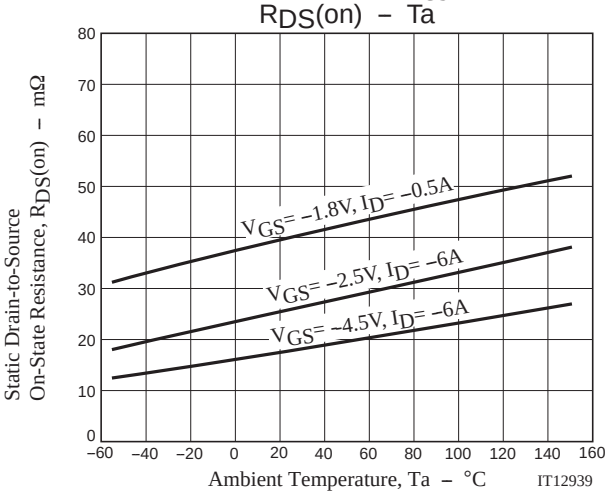
Ordering Information

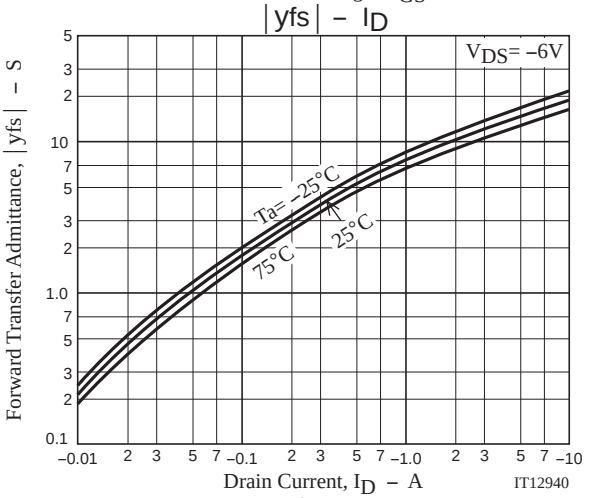
Device	Package	Shipping	memo
EMH1303-TL-E	EMH8	3,000pcs./reel	Pb Free

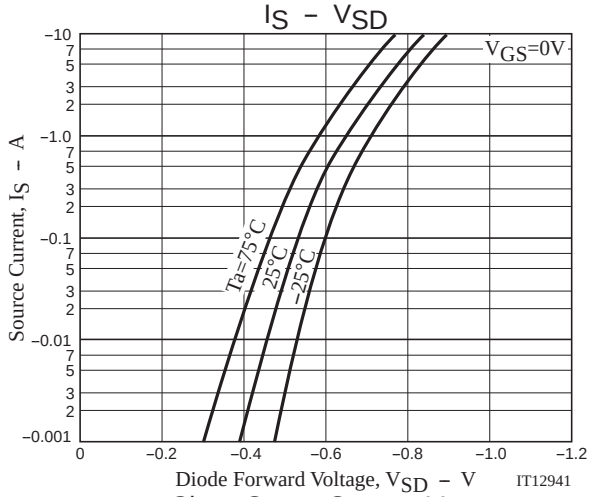

ID – VDS
Drain Current, ID – A
Drain-to-Source Voltage, VDS – V
IT12936
–8.0V
–2.5V
–4.0V
–1.8V
–4.5V
–6.0V
VGS= –1.5V

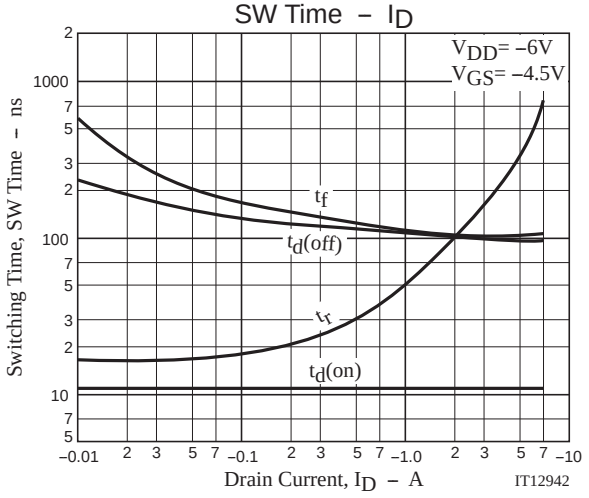

ID – VGS
Drain Current, ID – A
Gate-to-Source Voltage, VGS – V
IT12937
VDS= –6V
Ta=75°C
25°C
–25°C

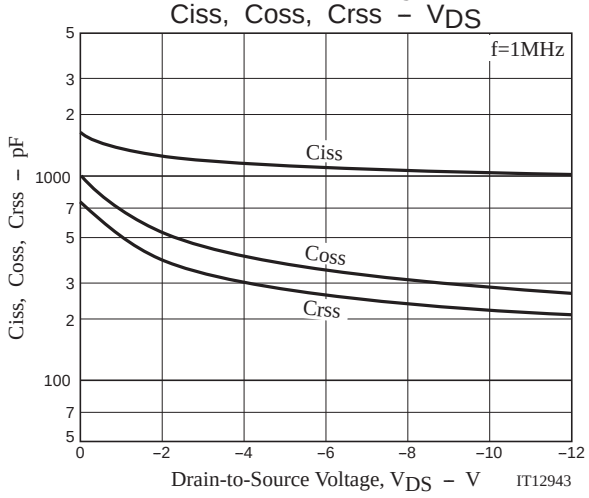

RDS(on) – VGS
Static Drain-to-Source On-State Resistance, RDS(on) – mΩ
Gate-to-Source Voltage, VGS – V
IT12938
Ta=25°C
ID= –0.5A
–6A

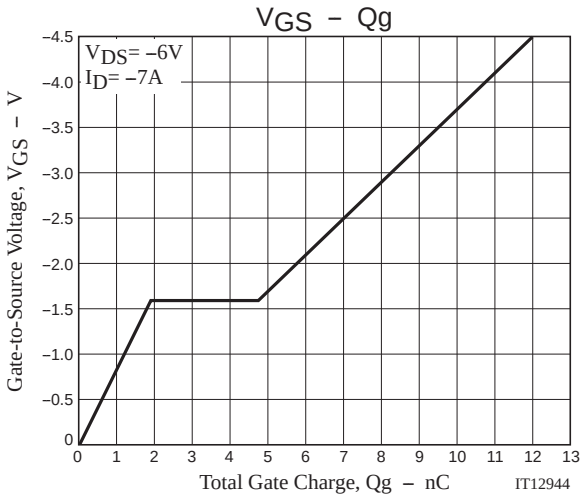

RDS(on) – Ta
Static Drain-to-Source On-State Resistance, RDS(on) – mΩ
Ambient Temperature, Ta – °C
IT12939
VGS= –1.8V, ID= –0.5A
VGS= –2.5V, ID= –6A
VGS= –4.5V, ID= –6A

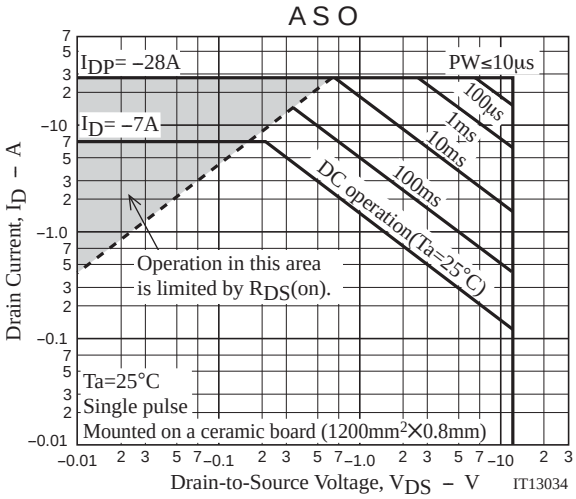

|yfs| – ID
Forward Transfer Admittance, |yfs| – S
Drain Current, ID – A
IT12940
VDS= –6V
Ta= –25°C
75°C
25°C

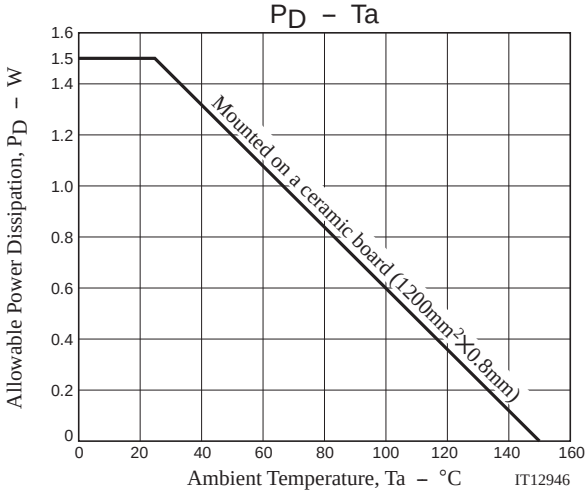

IS – VSD
Source Current, IS – A
Diode Forward Voltage, VSD – V
IT12941
VGS=0V
Ta=75°C
25°C
–25°C


SW Time – ID
Switching Time, SW Time – ns
Drain Current, ID – A
IT12942
VDD= –6V
VGS= –4.5V
tf
td(off)
tr
td(on)


Ciss, Coss, Crss – VDS
Ciss, Coss, Crss – pF
Drain-to-Source Voltage, VDS – V
IT12943
f=1MHz
Ciss
Coss
Crss


VGS – Qg
VDS= –6V
ID= –7A
Gate-to-Source Voltage, VGS – V
Total Gate Charge, Qg – nC
IT12944


A S O
IDP= –28A
PW≤10μs
ID= –7A
100μs
1ms
10ms
100ms
DC operation(Ta=25°C)
Operation in this area
is limited by RDS(on).
Ta=25°C
Single pulse
Mounted on a ceramic board (1200mm2×0.8mm)
Drain Current, ID – A
Drain-to-Source Voltage, VDS – V
IT13034


PD – Ta
Mounted on a ceramic board (1200mm2×0.8mm)
Allowable Power Dissipation, PD – W
Ambient Temperature, Ta – °C
IT12946

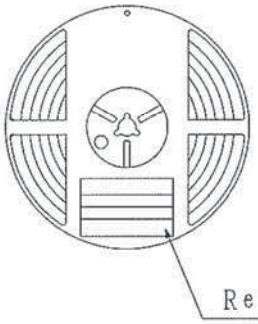
Embossed Taping Specification

EMH1303-TL-E

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

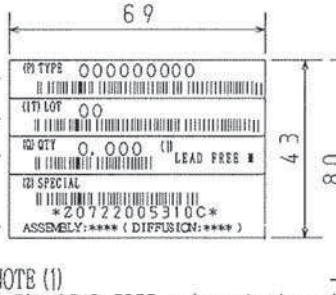
Packing method



Reel label

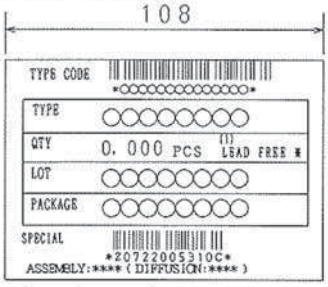
Reel label, Inner box label

(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.



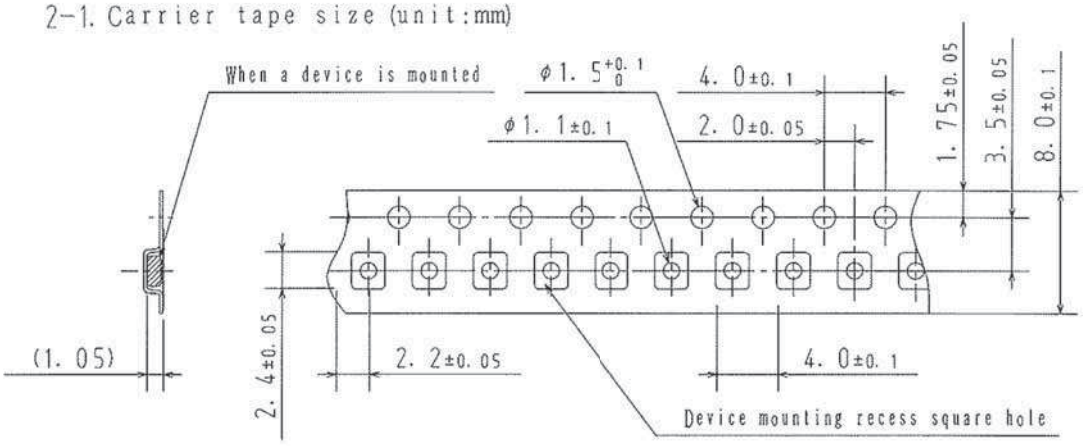
NOTE (1)

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

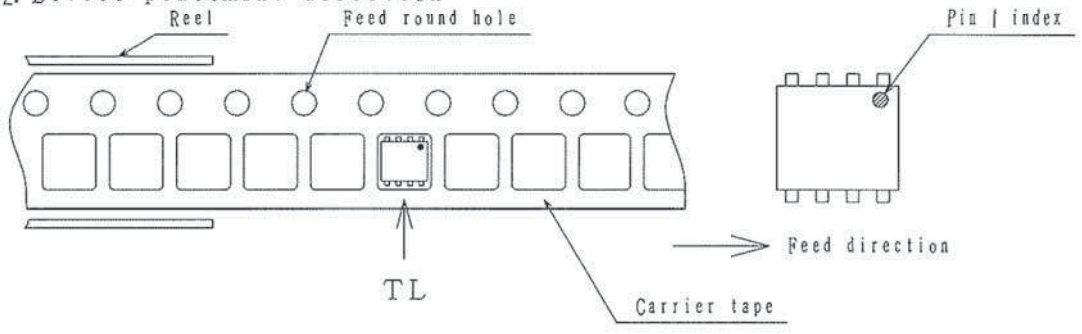
Label	JEITA Phase
LEAD FREE 3	JEITA Phase 3A
LEAD FREE 4	JEITA Phase 3

2. Taping configuration

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



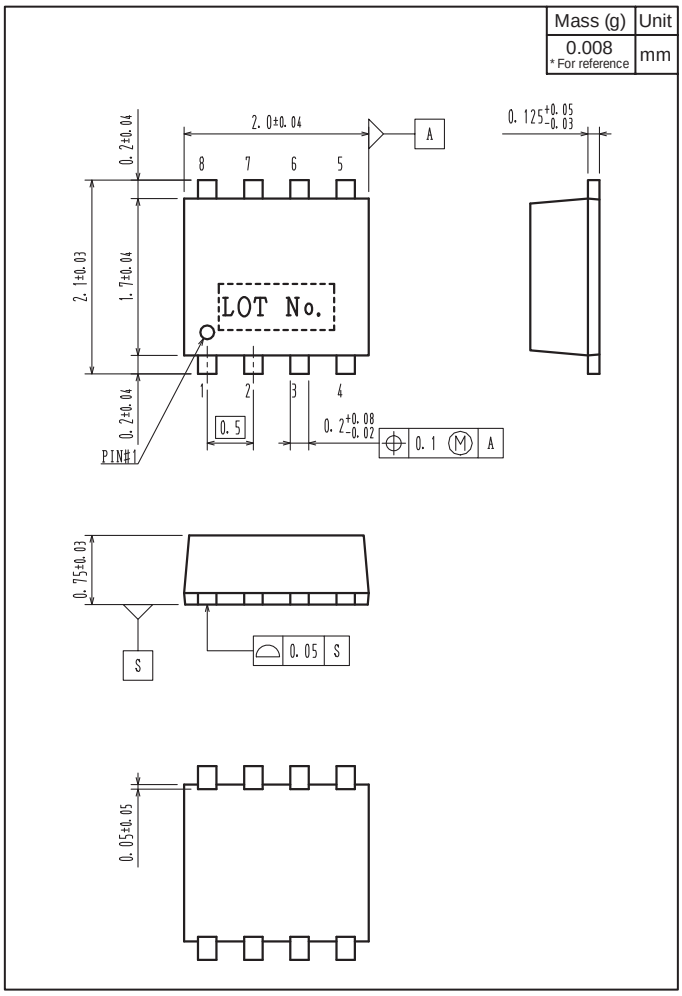
2-2. Device placement direction



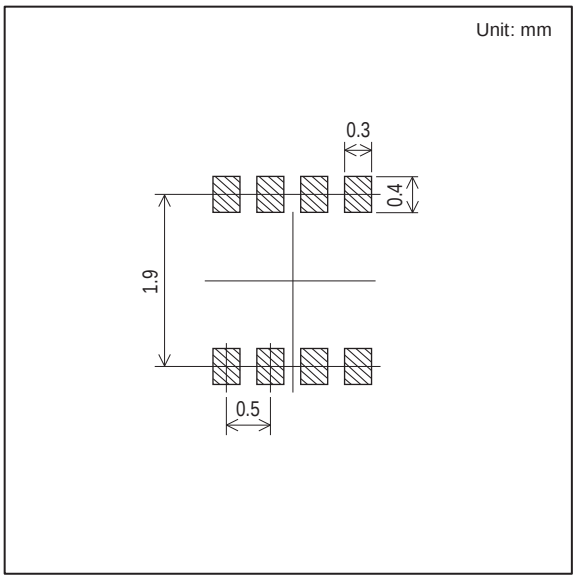
Those with pin 1 index on the feed hole side·····TL

Outline Drawing

EMH1303-TL-E



Land Pattern Example



Note on usage : Since the EMH1303 is a MOSFET product, please avoid using this device in the vicinity of highly charged objects.

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