



EMH2801

MOSFET : P-Channel Silicon MOSFET
SBD : Schottky Barrier Diode

General-Purpose Switching Device Applications

Features

- Composite type with a P-Channel Silicon MOSFET and a Schottky Barrier Diode contained in one package facilitating high-density mounting
- [MOSFET] • Low ON-resistance
- [SBD] • Small switching noise
- Halogen free compliance
- 1.8V drive
- Low forward voltage ($I_F=2.0A$, $V_F \text{ max}=0.46V$)

Specifications

Absolute Maximum Ratings at $T_a=25^\circ C$

Parameter	Symbol	Conditions	Ratings	Unit
[MOSFET]				
Drain-to-Source Voltage	V_{DSS}		-20	V
Gate-to-Source Voltage	V_{GSS}		± 10	V
Drain Current (DC)	I_D		-3	A
Drain Current (Pulse)	I_{DP}	$PW \leq 10\mu s$, duty cycle $\leq 1\%$	-20	A
Allowable Power Dissipation	P_D	When mounted on ceramic substrate (900mm ² x 0.8mm) 1unit	1.0	W
Channel Temperature	T_{ch}		150	$^\circ C$
Storage Temperature	T_{stg}		-55 to +125	$^\circ C$

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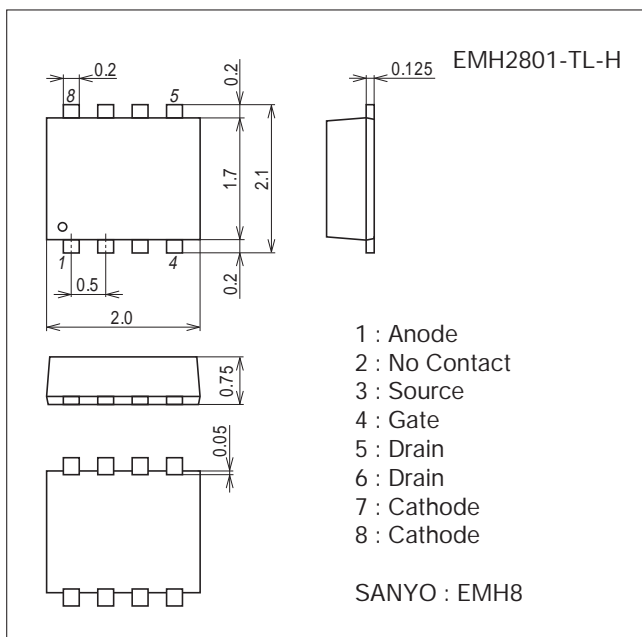
This product is designed to "ESD immunity < 200V**", so please take care when handling.

* Machine Model

Package Dimensions

unit : mm (typ)

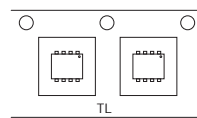
7045-007



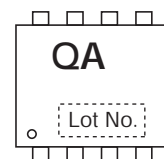
Product & Package Information

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

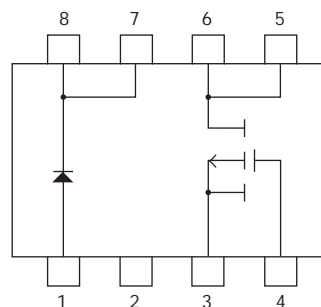
Packing Type : TL



Marking



Electrical Connection



EMH2801

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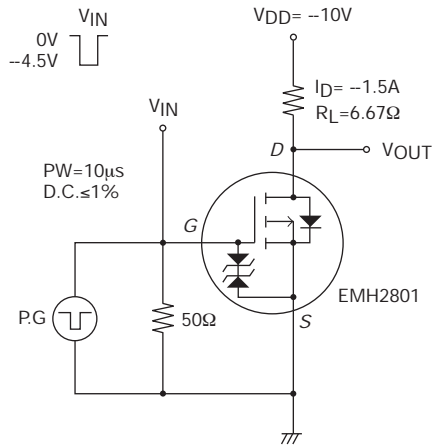
Parameter	Symbol	Conditions	Ratings	Unit
[SBD]				
Repetitive Peak Reverse Voltage	V_{RRM}		15	V
Nonrepetitive Peak Reverse Surge Voltage	V_{RSM}		15	V
Average Output Current	I_O	Rectangular wave	2.0	A
Surge Forward Current	I_{FSM}	50Hz sine wave, 1 cycle	20	A
Junction Temperature	T_J		-55 to +125	°C
Storage Temperature	T_{stg}		-55 to +125	°C

Electrical Characteristics at $T_a=25^\circ\text{C}$

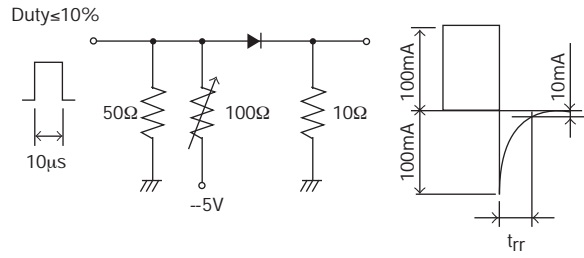
Parameter	Symbol	Conditions	Ratings			Unit
			min	typ	max	
[MOSFET]						
Drain-to-Source Breakdown Voltage	$V_{(BR)DSS}$	$I_D=-1\text{mA}, V_{GS}=0\text{V}$	-20			V
Zero-Gate Voltage Drain Current	I_{DSS}	$V_{DS}=-20\text{V}, V_{GS}=0\text{V}$			-1	μA
Gate-to-Source Leakage Current	I_{GSS}	$V_{GS}=\pm 8\text{V}, V_{DS}=0\text{V}$			± 10	μA
Cutoff Voltage	$V_{GS(off)}$	$V_{DS}=-10\text{V}, I_D=-1\text{mA}$	-0.4		-1.3	V
Forward Transfer Admittance	$ y_{fs} $	$V_{DS}=-10\text{V}, I_D=-1.5\text{A}$		3.6		S
Static Drain-to-Source On-State Resistance	$R_{DS(on)1}$	$I_D=-1.5\text{A}, V_{GS}=-4.5\text{V}$		65	85	$\text{m}\Omega$
	$R_{DS(on)2}$	$I_D=-1\text{A}, V_{GS}=-2.5\text{V}$		98	137	$\text{m}\Omega$
	$R_{DS(on)3}$	$I_D=-0.5\text{A}, V_{GS}=-1.8\text{V}$		155	235	$\text{m}\Omega$
Input Capacitance	C_{iss}	$V_{DS}=-10\text{V}, f=1\text{MHz}$		320		pF
Output Capacitance	C_{oss}			66		pF
Reverse Transfer Capacitance	C_{rss}			50		pF
Turn-ON Delay Time	$t_{d(on)}$		See specified Test Circuit.		7.1	
Rise Time	t_r			21		ns
Turn-OFF Delay Time	$t_{d(off)}$			37		ns
Fall Time	t_f			32		ns
Total Gate Charge	Q_g	$V_{DS}=-10\text{V}, V_{GS}=-4.5\text{V}, I_D=-3\text{A}$			4.0	
Gate-to-Source Charge	Q_{gs}			0.6		nC
Gate-to-Drain "Miller" Charge	Q_{gd}			1.1		nC
Diode Forward Voltage	V_{SD}	$I_S=-3\text{A}, V_{GS}=0\text{V}$		-0.83	-1.2	V
[SBD]						
Reverse Voltage	V_R	$I_R=1\text{mA}$	15			V
Forward Voltage	V_{F1}	$I_F=1.0\text{A}$		0.33	0.39	V
	V_{F2}	$I_F=2.0\text{A}$		0.39	0.46	V
Reverse Current	I_R	$V_R=7.5\text{V}$			300	μA
Interterminal Capacitance	C	$V_R=10\text{V}, f=1\text{MHz}$		35		pF

EMH2801

Switching Time Test Circuit (MOSFET)

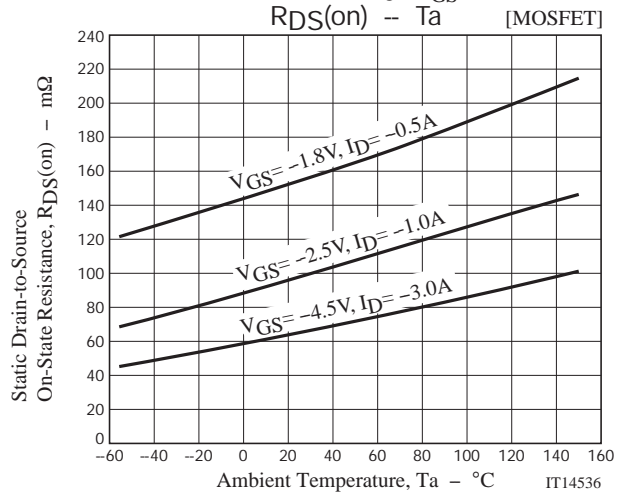
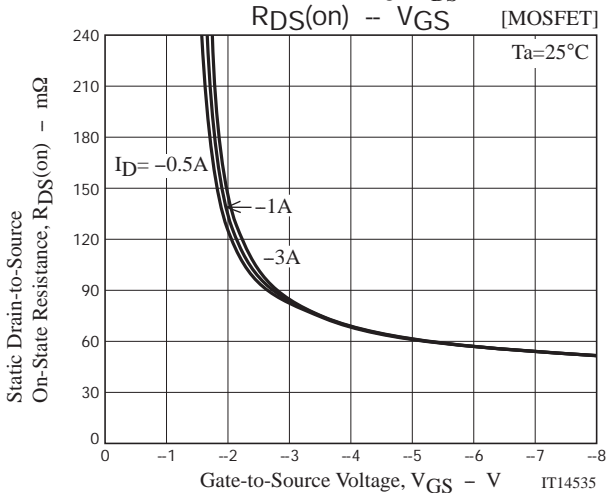
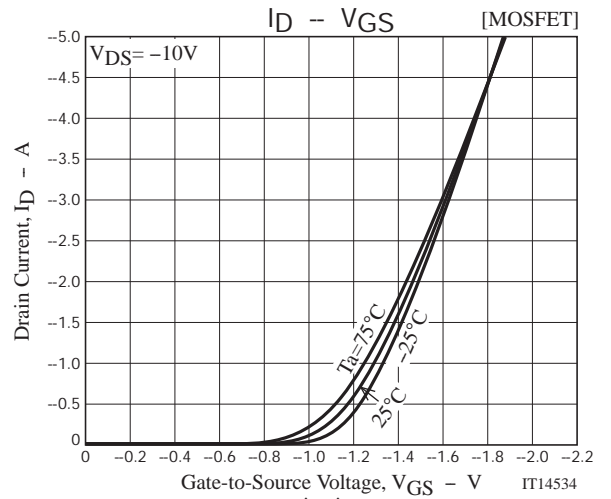
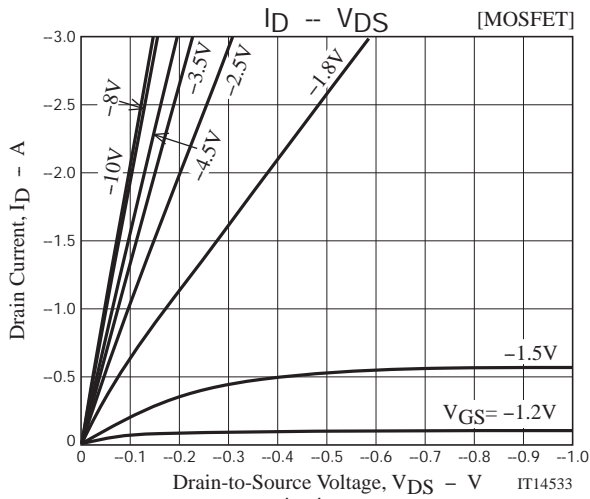


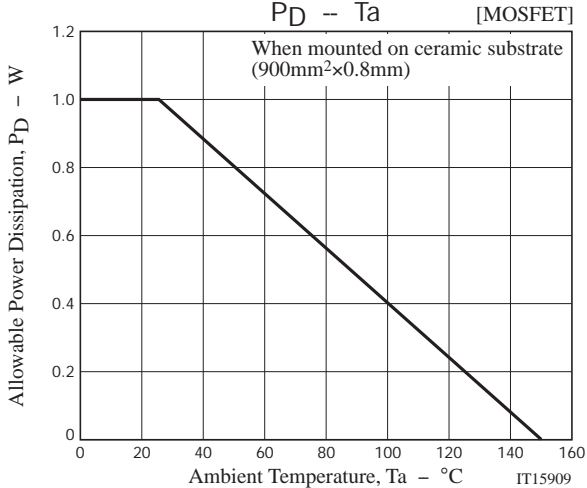
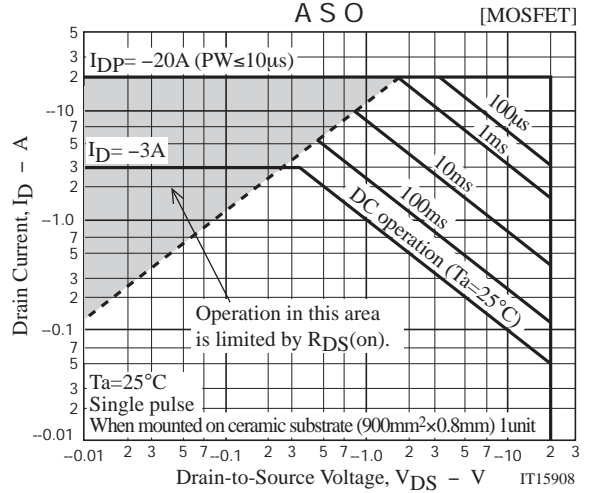
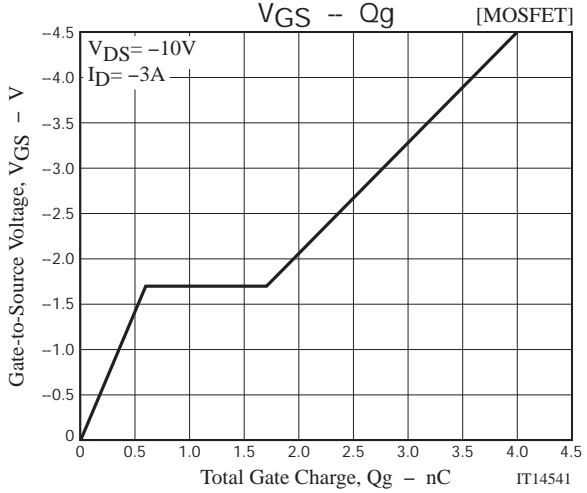
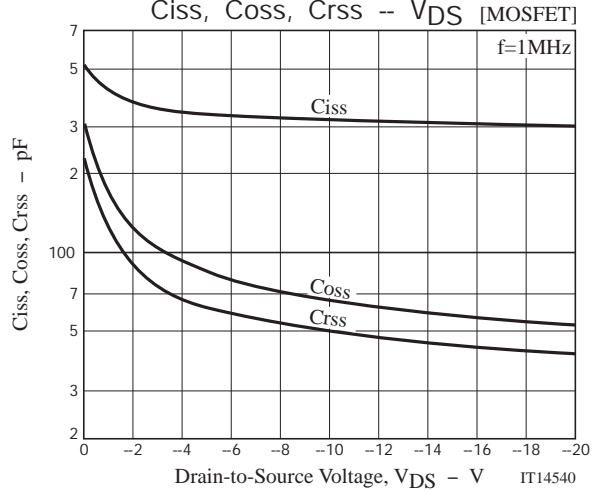
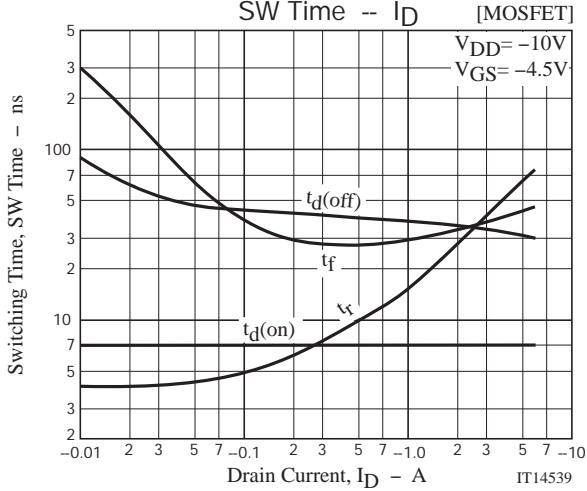
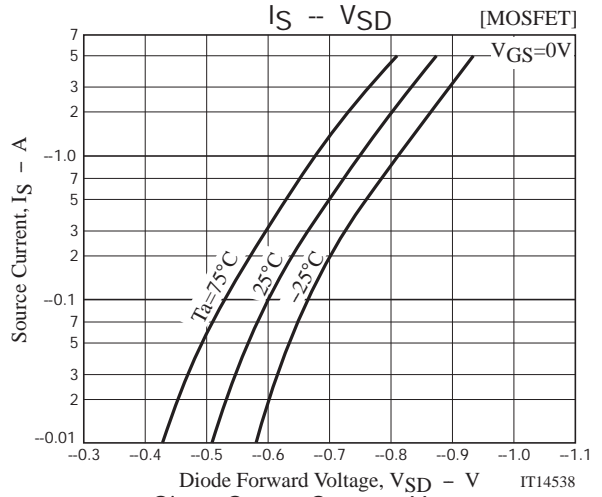
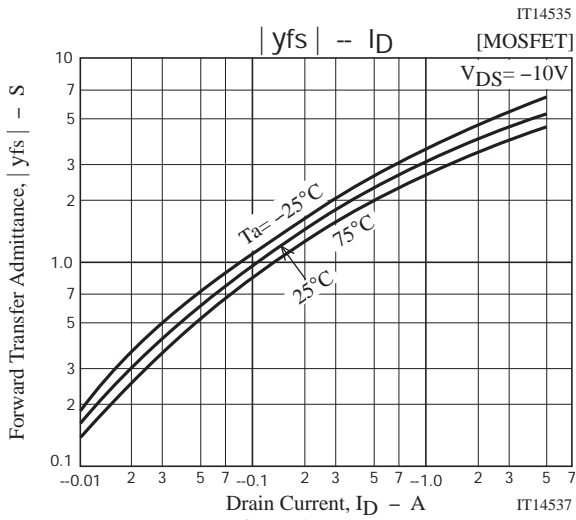
t_{rr} Test Circuit (SBD)

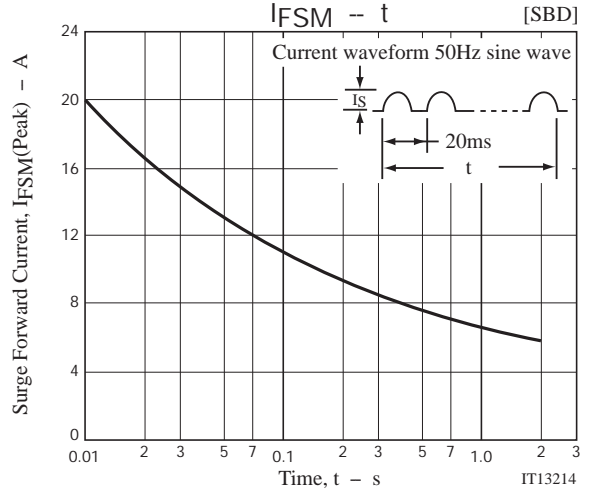
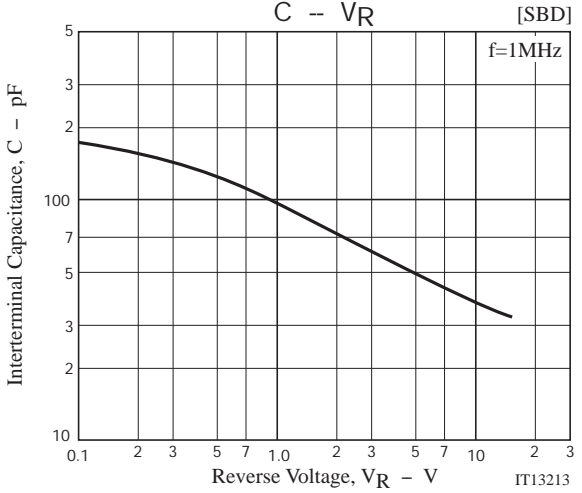
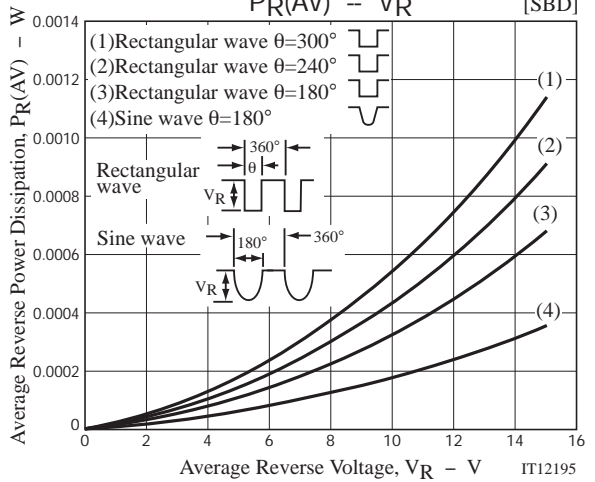
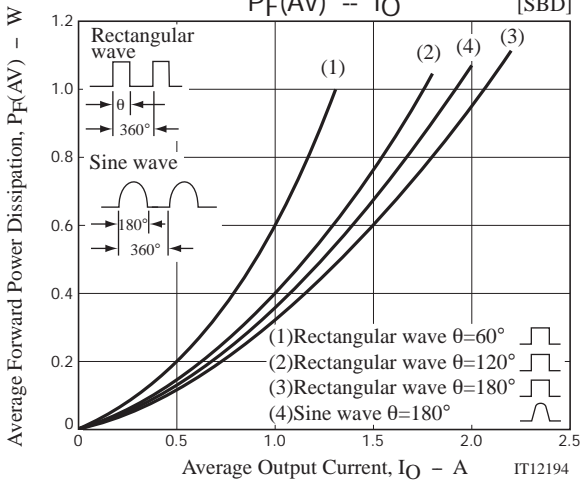
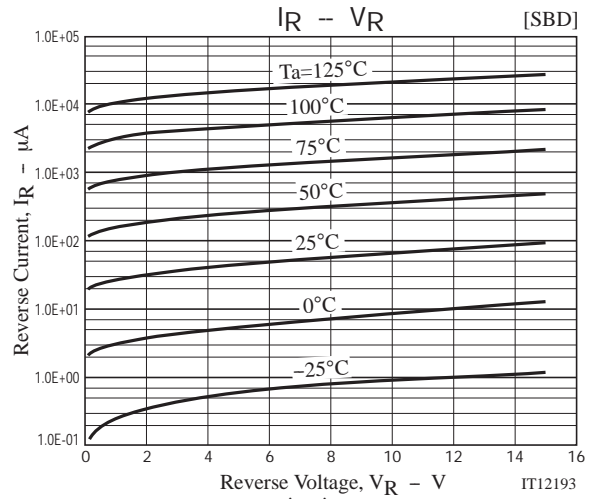
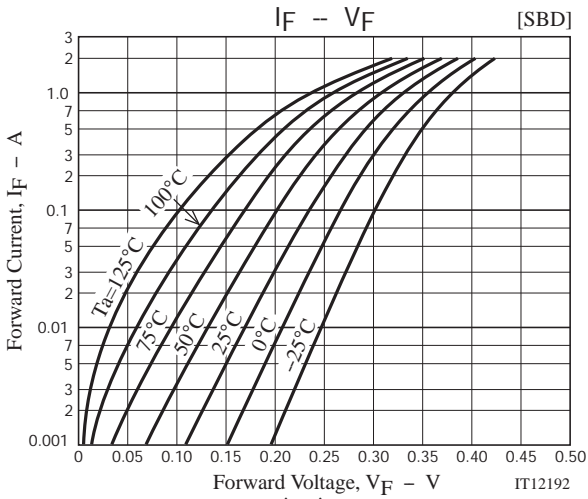


Ordering Information

Device	Package	Shipping	memo
EMH2801-TL-H	EMH8	3,000pcs./reel	Pb Free and Halogen Free







EMH2801

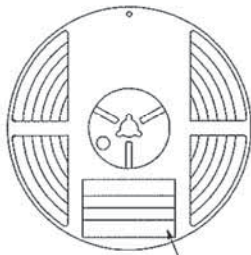
Embossed Taping Specification

EMH2801-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

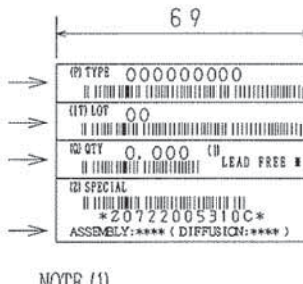
Packing method



Reel label

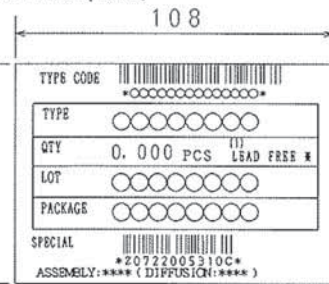
Type No. →
LOT No. →
Quantity →
Origin →

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.



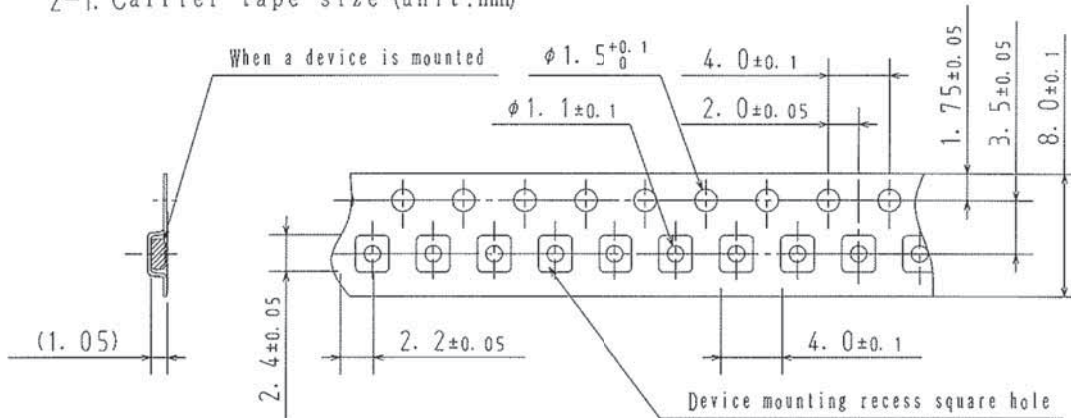
NOTE (1)

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

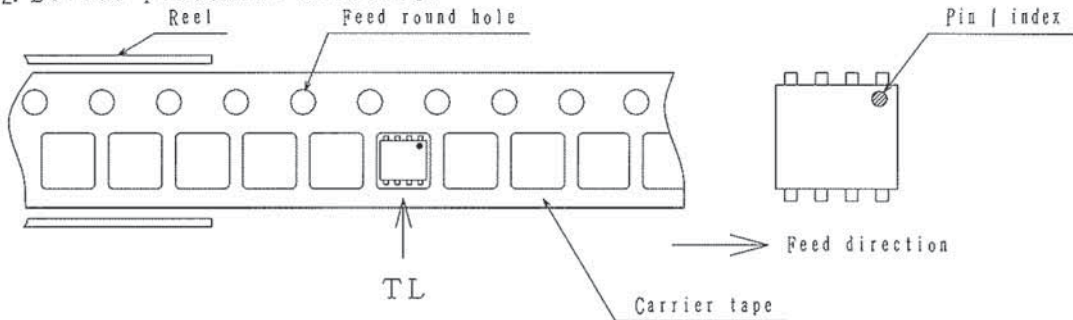
Label	JEITA Phase
LEAD FREE 3	JEITA Phase 3A
LEAD FREE 4	JEITA Phase 3

2. Taping configuration

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



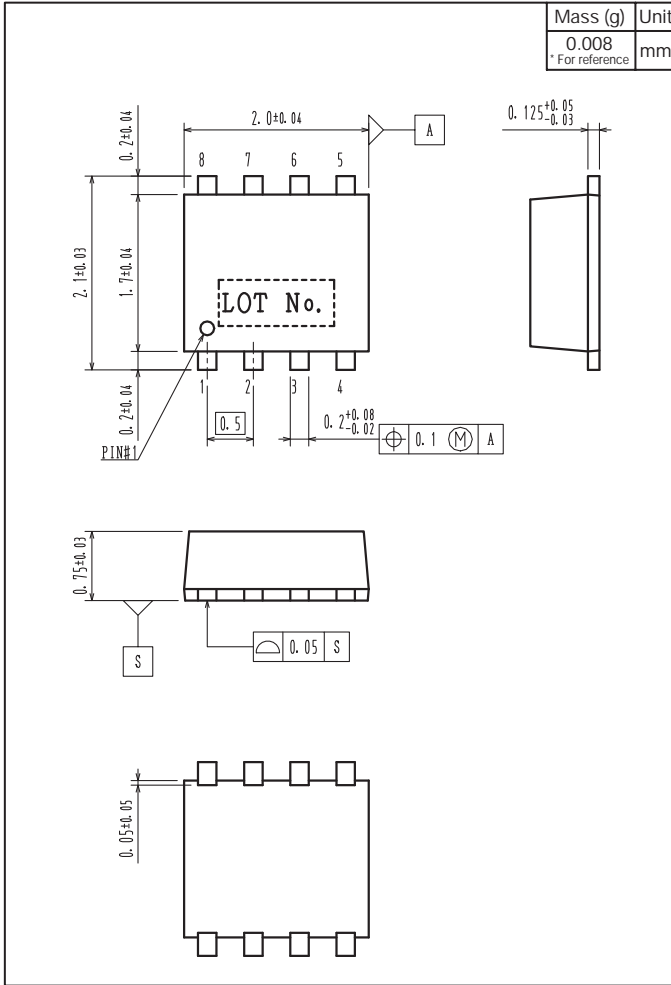
2-2. Device placement direction



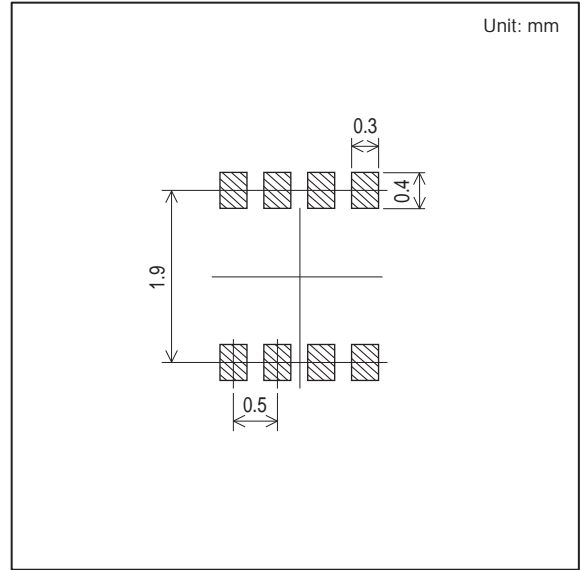
Those with pin | index on the feed hole side.....TL

EMH2801

Outline Drawing EMH2801-TL-H



Land Pattern Example



Note on usage : Since the EMH2801 is a MOSFET product, please avoid using this device in the vicinity of highly charged objects.

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