



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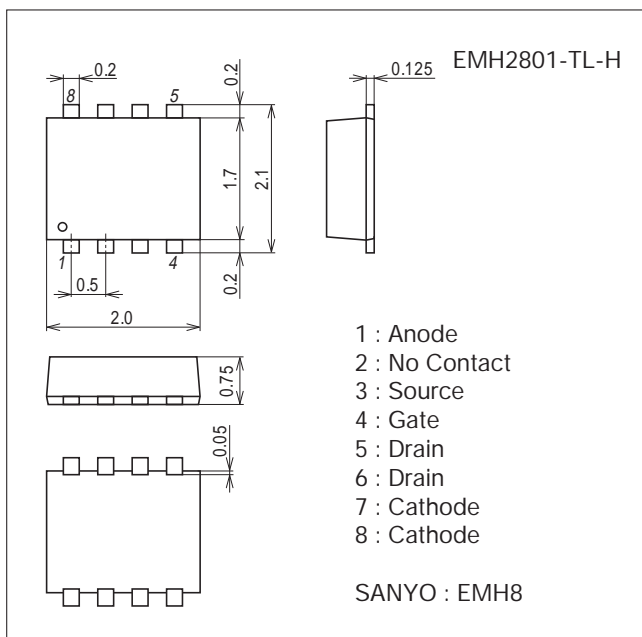
This product is designed to "ESD immunity < 200V**", so please take care when handling.

* Machine Model

Package Dimensions

unit : mm (typ)

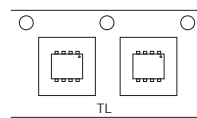
7045-007



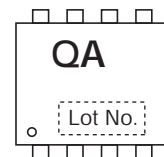
Product & Package Information

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

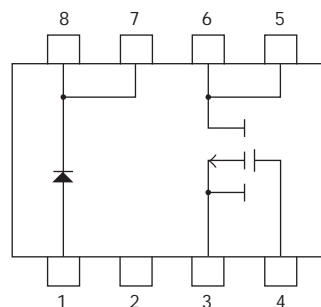
Packing Type : TL



Marking



Electrical Connection



EMH2801

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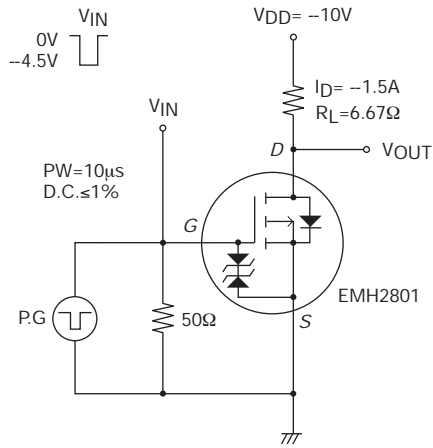
| Parameter | Symbol | Conditions | Ratings | Unit |
|--|-----------|-------------------------|-------------|------|
| [SBD] | | | | |
| Repetitive Peak Reverse Voltage | V_{RRM} | | 15 | V |
| Nonrepetitive Peak Reverse Surge Voltage | V_{RSM} | | 15 | V |
| Average Output Current | I_O | Rectangular 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 $T_a=25^\circ\text{C}$

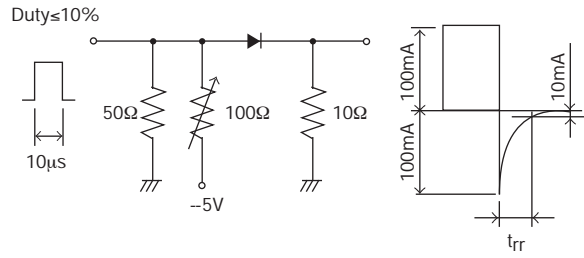
| Parameter | Symbol | Conditions | Ratings | | | Unit |
|--|---------------|---|-----------------------------|-------|----------|------------------|
| | | | min | typ | max | |
| [MOSFET] | | | | | | |
| Drain-to-Source Breakdown Voltage | $V_{(BR)DSS}$ | $I_D=-1\text{mA}, V_{GS}=0\text{V}$ | -20 | | | 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 |

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Switching Time Test Circuit (MOSFET)

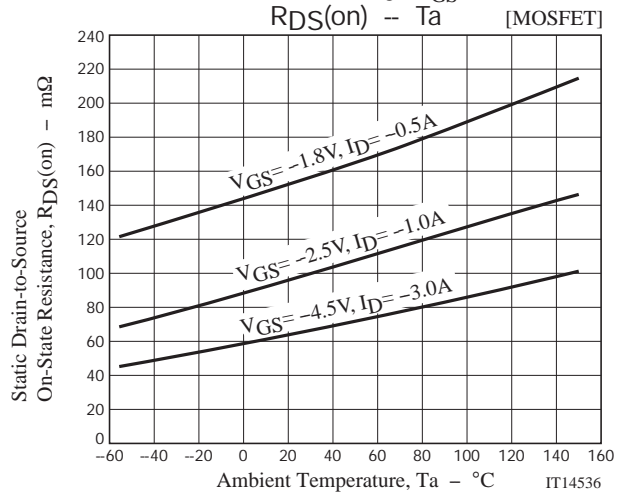
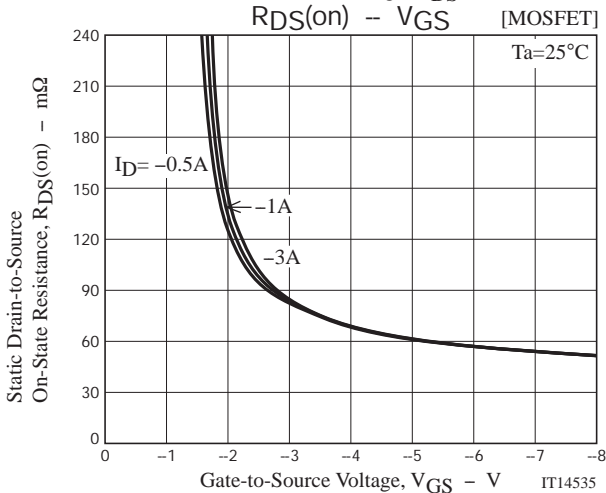
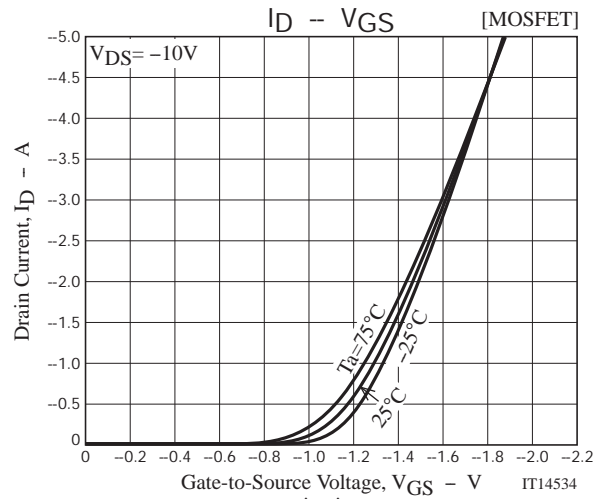
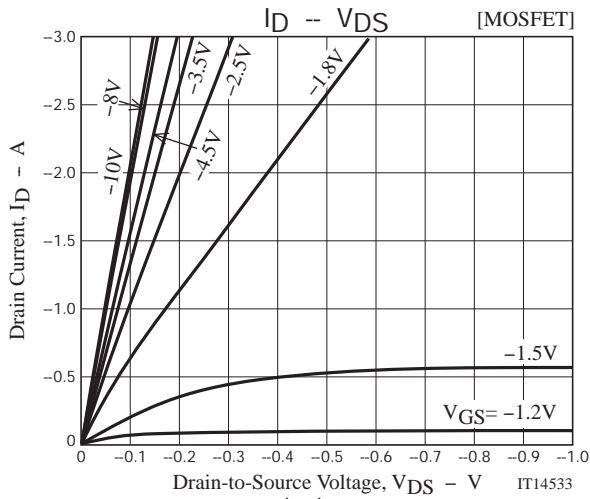


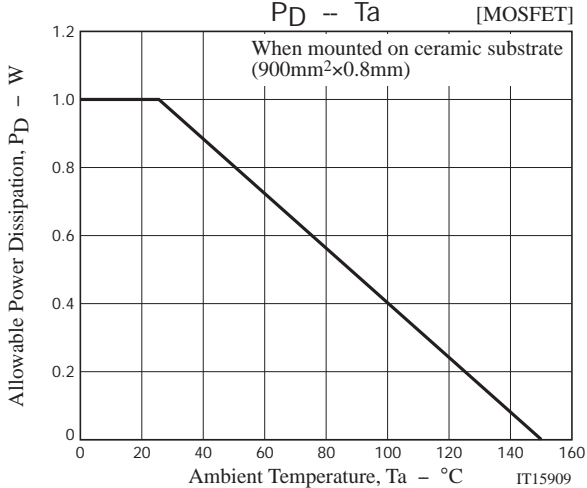
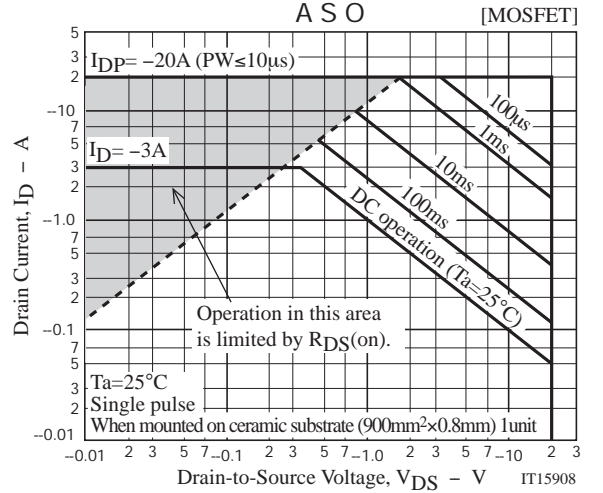
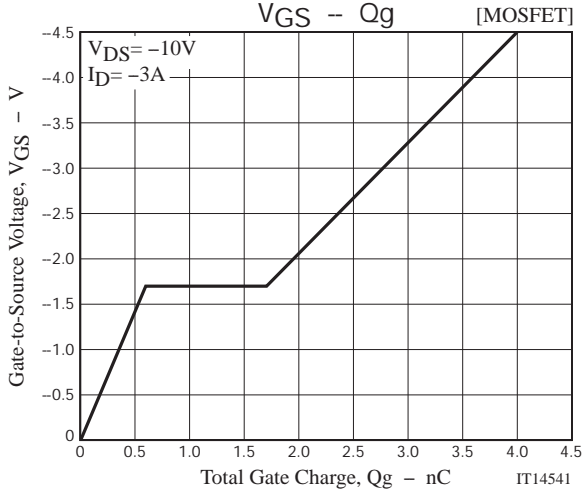
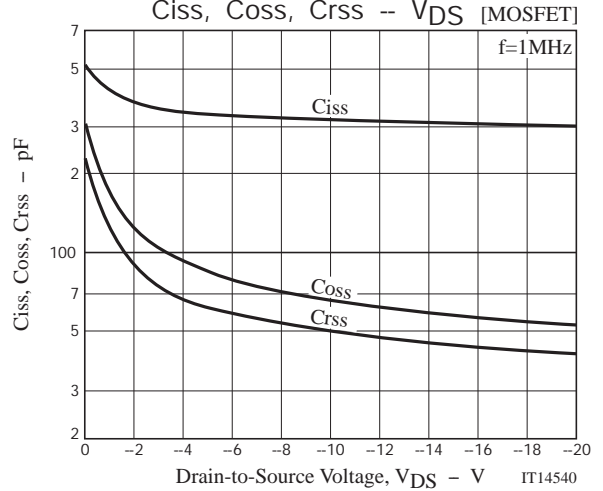
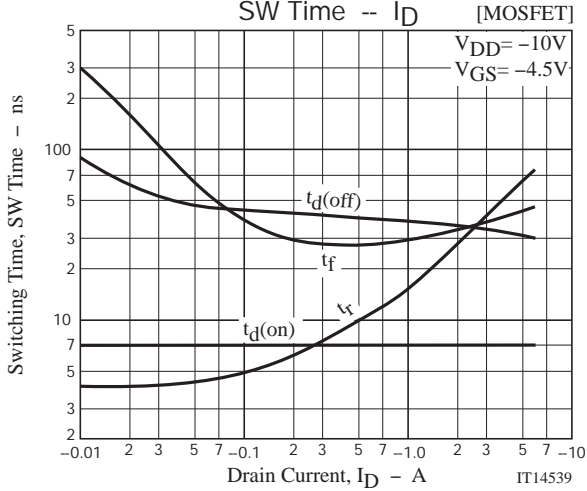
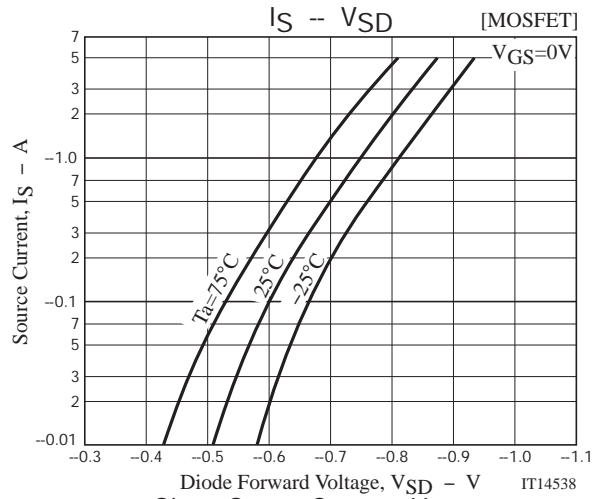
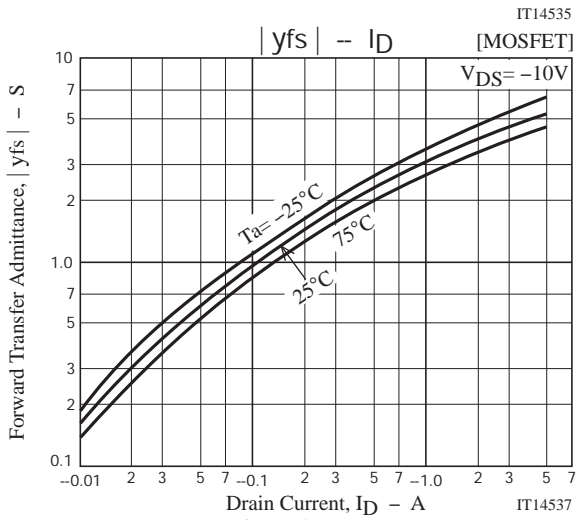
t_{rr} Test Circuit (SBD)

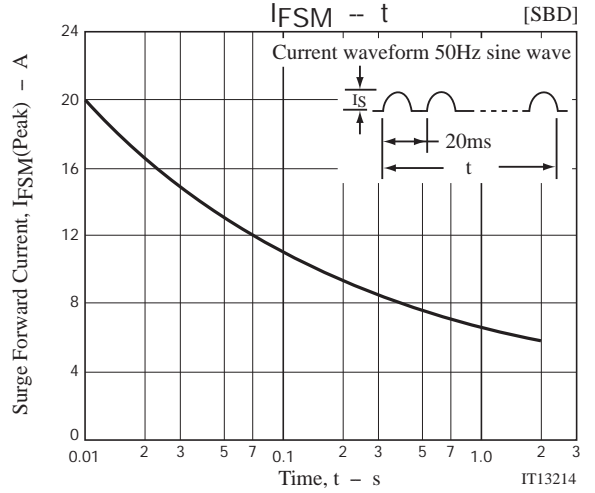
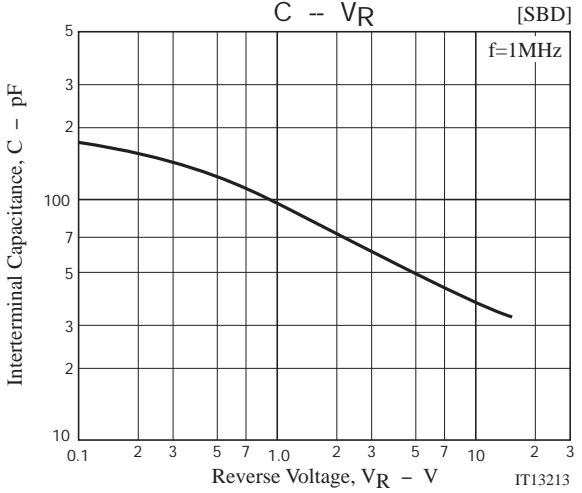
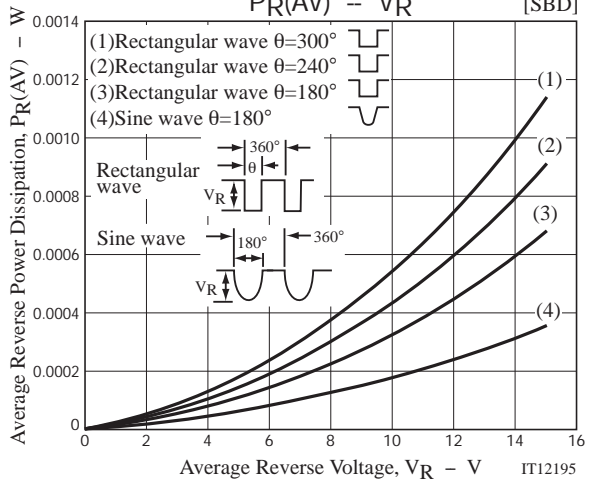
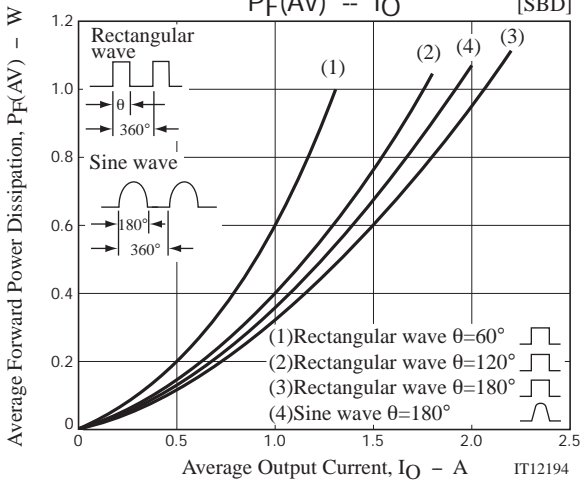
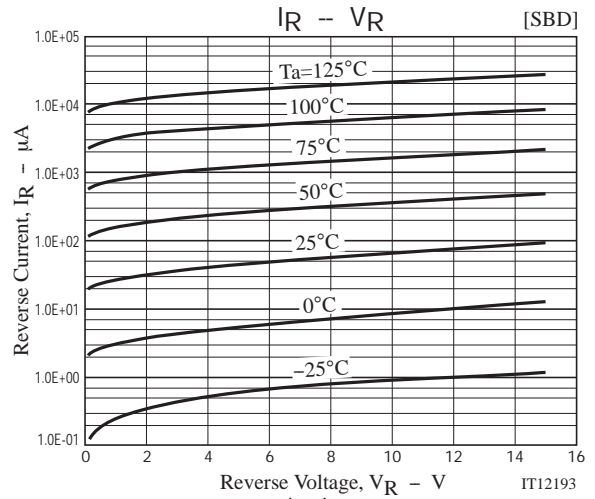
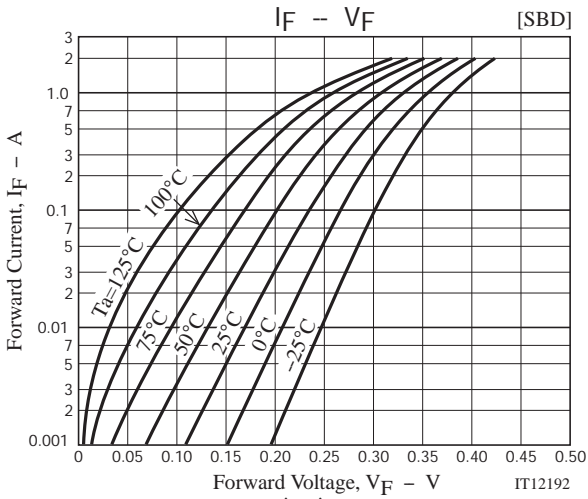


Ordering Information

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







EMH2801

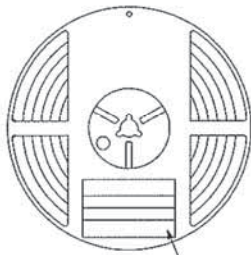
Embossed Taping Specification

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 |

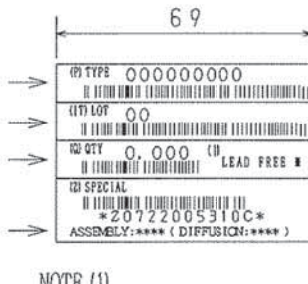
Packing method



Reel label

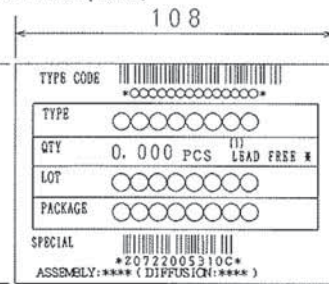
Type No. →
LOT No. →
Quantity →
Origin →

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.



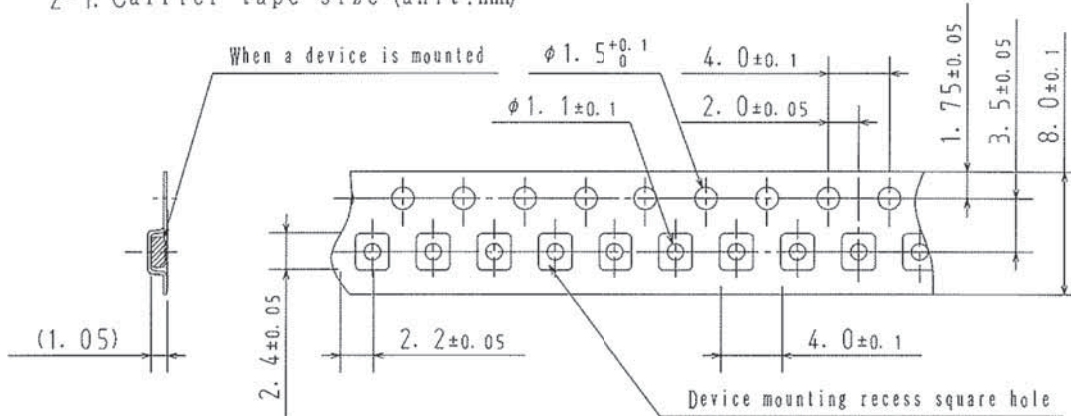
NOTE (1)

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

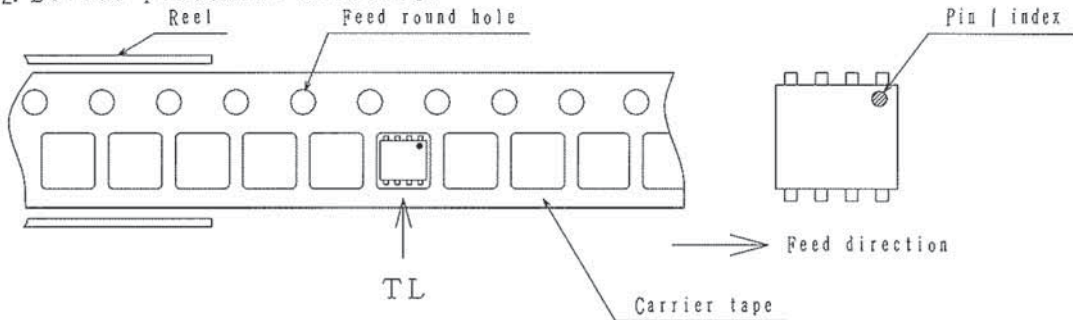
| Label | JEITA Phase |
|-------------|----------------|
| LEAD FREE 3 | JEITA Phase 3A |
| LEAD FREE 4 | JEITA Phase 3 |

2. Taping configuration

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



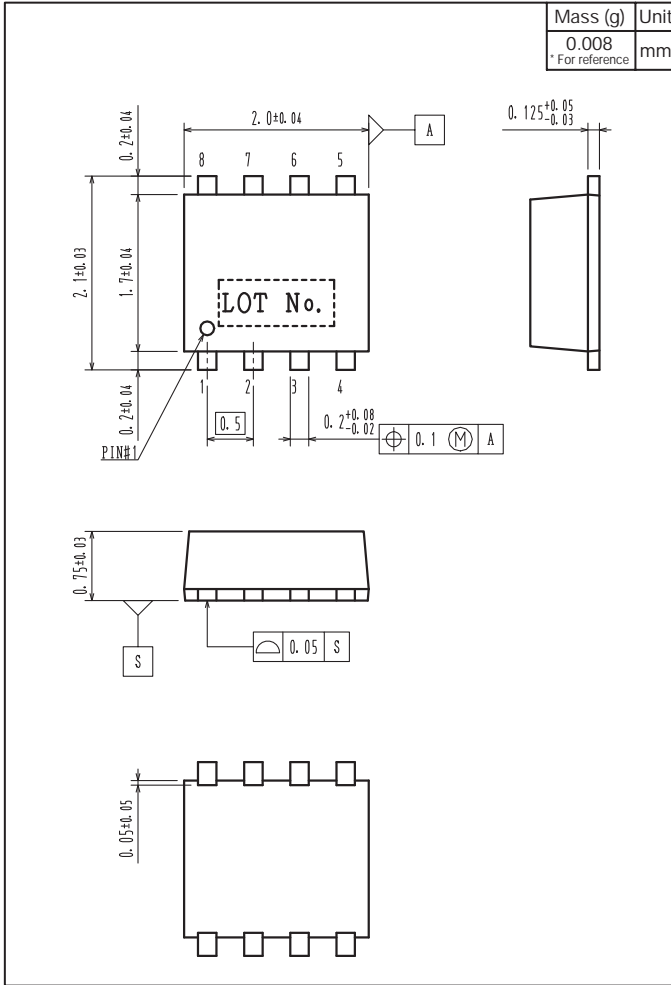
2-2. Device placement direction



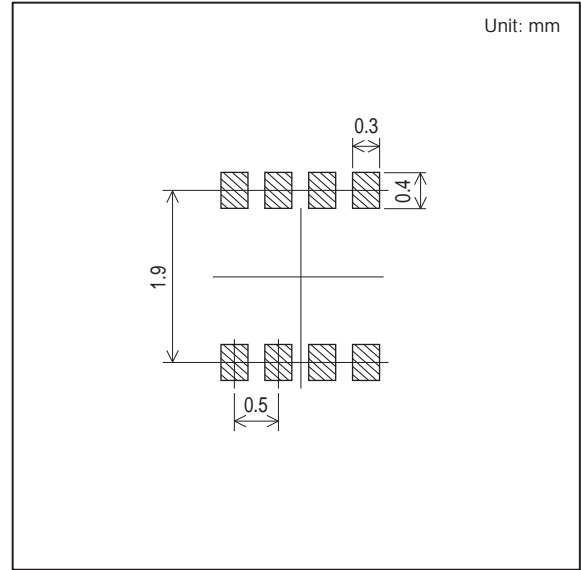
Those with pin | index on the feed hole side.....TL

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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