



# EMH2411R — N-Channel Silicon MOSFET

## General-Purpose Switching Device Applications

### Features

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

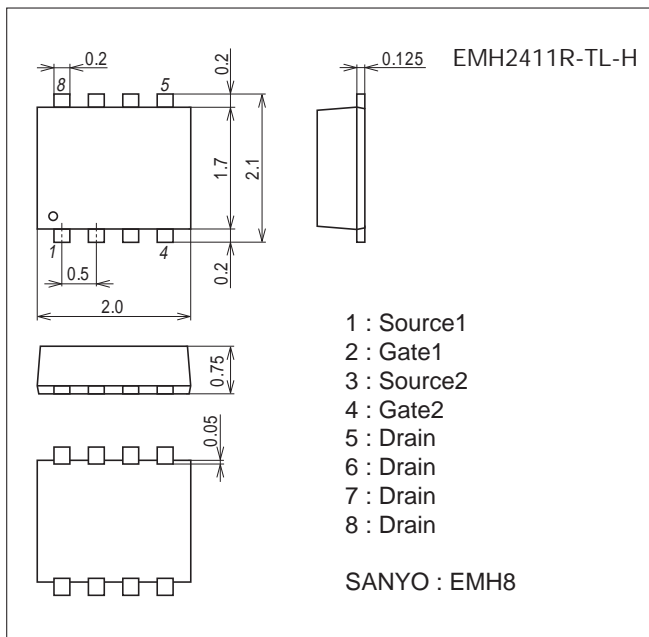
### Specifications

Absolute Maximum Ratings at Ta=25°C

Parameter	Symbol	Conditions	Ratings	Unit
Drain-to-Source Voltage	V <sub>DSS</sub>		30	V
Gate-to-Source Voltage	V <sub>GSS</sub>		±12	V
Drain Current (DC)	I <sub>D</sub>		5	A
Drain Current (Pulse)	I <sub>DP</sub>	PW≤10μs, duty cycle≤1%	60	A
Allowable Power Dissipation	P <sub>D</sub>	When mounted on ceramic substrate (900mm <sup>2</sup> ×0.8mm) 1unit	1.3	W
Total Dissipation	P <sub>T</sub>	When mounted on ceramic substrate (900mm <sup>2</sup> ×0.8mm)	1.4	W
Channel Temperature	T <sub>ch</sub>		150	°C
Storage Temperature	T <sub>stg</sub>		-55 to +150	°C

### Package Dimensions

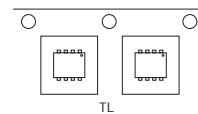
unit : mm (typ)  
7045-006



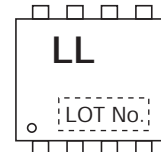
### Product & Package Information

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

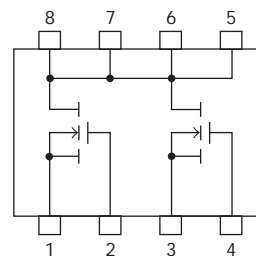
### Packing Type : TL



### Marking



### Electrical Connection

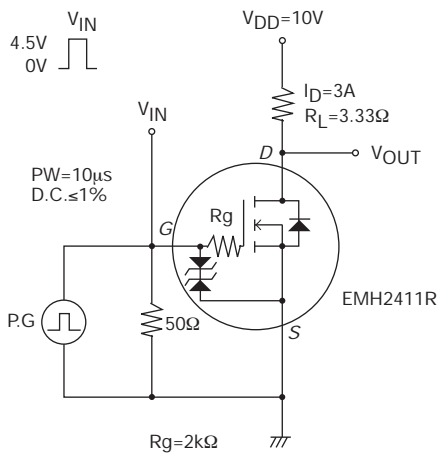


# EMH2411R

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

Parameter	Symbol	Conditions	Ratings			Unit
			min	typ	max	
Drain-to-Source Breakdown Voltage	$V_{(BR)DSS}$	$I_D=1\text{mA}$ , $V_{GS}=0\text{V}$	30			V
Zero-Gate Voltage Drain Current	$I_{DSS}$	$V_{DS}=30\text{V}$ , $V_{GS}=0\text{V}$			1	$\mu\text{A}$
Gate-to-Source Leakage Current	$I_{GSS}$	$V_{GS}=\pm 8\text{V}$ , $V_{DS}=0\text{V}$			$\pm 10$	$\mu\text{A}$
Cutoff Voltage	$V_{GS(off)}$	$V_{DS}=10\text{V}$ , $I_D=1\text{mA}$	0.5		1.3	V
Forward Transfer Admittance	$ y_{fs} $	$V_{DS}=10\text{V}$ , $I_D=3\text{A}$	3	5		S
Static Drain-to-Source On-State Resistance	$R_{DS(on)1}$	$I_D=2.5\text{A}$ , $V_{GS}=4.5\text{V}$	19.5	28	36.5	$\text{m}\Omega$
	$R_{DS(on)2}$	$I_D=2.5\text{A}$ , $V_{GS}=4\text{V}$	20	29	38	$\text{m}\Omega$
	$R_{DS(on)3}$	$I_D=1\text{A}$ , $V_{GS}=3.7\text{V}$	21	30	39	$\text{m}\Omega$
	$R_{DS(on)4}$	$I_D=1\text{A}$ , $V_{GS}=3.1\text{V}$	21	33	46.5	$\text{m}\Omega$
	$R_{DS(on)5}$	$I_D=1\text{A}$ , $V_{GS}=2.5\text{V}$	22.5	38	54	$\text{m}\Omega$
Turn-ON Delay Time	$t_{d(on)}$	See specified Test Circuit.		300		ns
Rise Time	$t_r$			840		ns
Turn-OFF Delay Time	$t_{d(off)}$			3200		ns
Fall Time	$t_f$			1650		ns
Total Gate Charge	$Q_g$				5.9	
Gate-to-Source Charge	$Q_{gs}$	$V_{DS}=10\text{V}$ , $V_{GS}=4.5\text{V}$ , $I_D=5\text{A}$		1		nC
Gate-to-Drain "Miller" Charge	$Q_{gd}$			1.2		nC
Diode Forward Voltage	$V_{SD}$		$I_S=5\text{A}$ , $V_{GS}=0\text{V}$		0.8	1.2

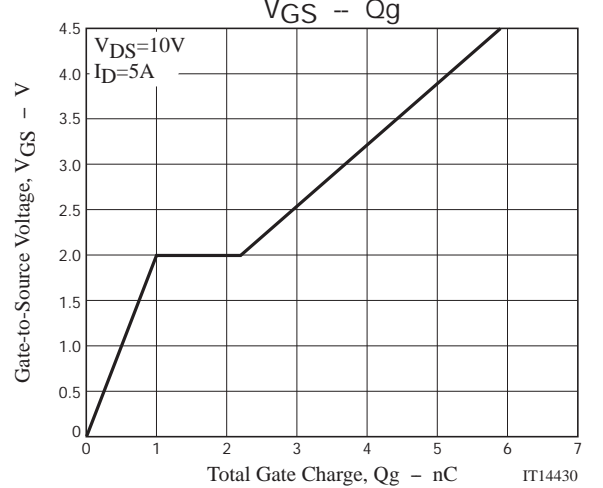
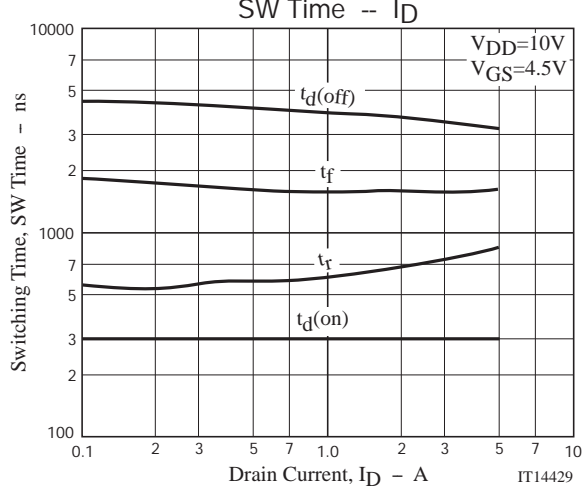
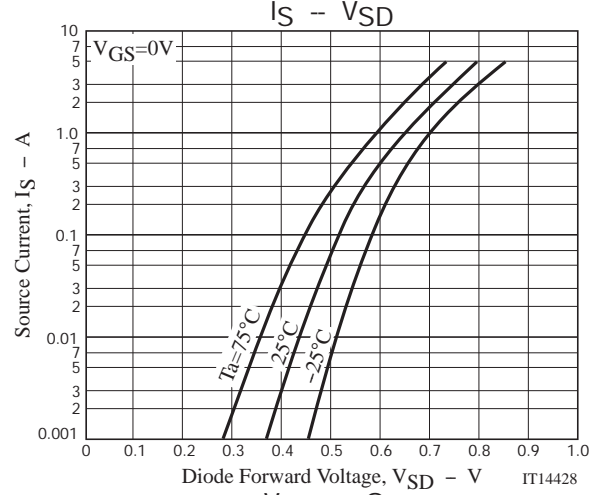
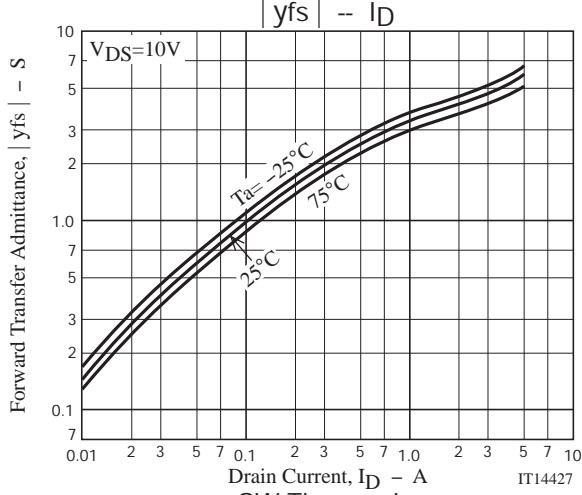
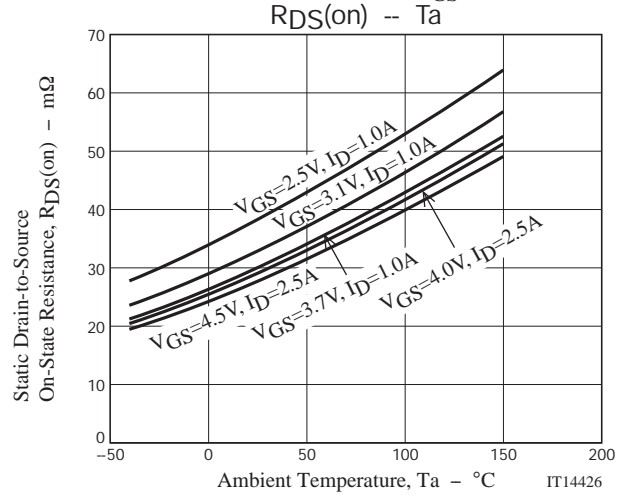
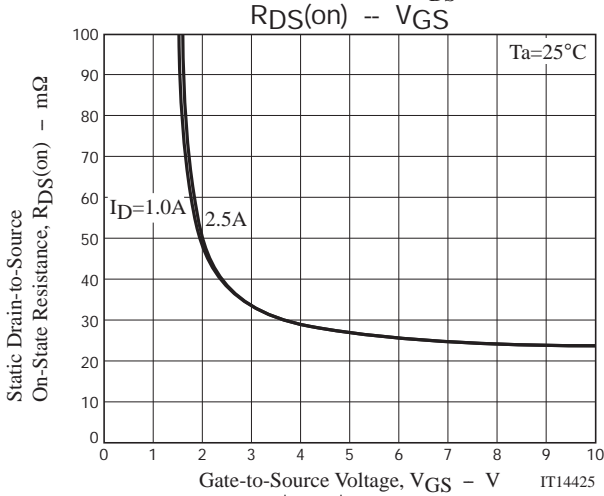
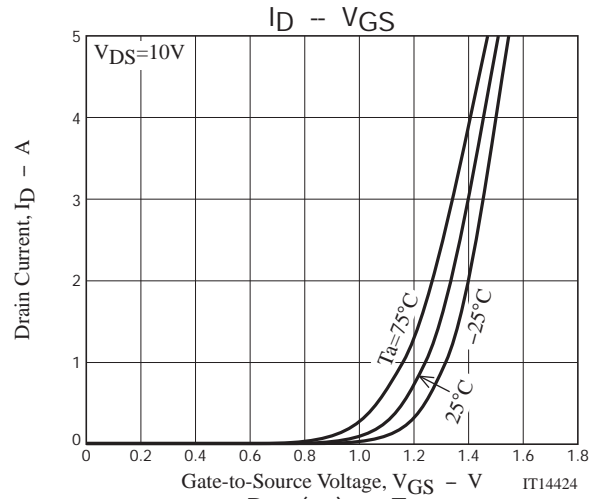
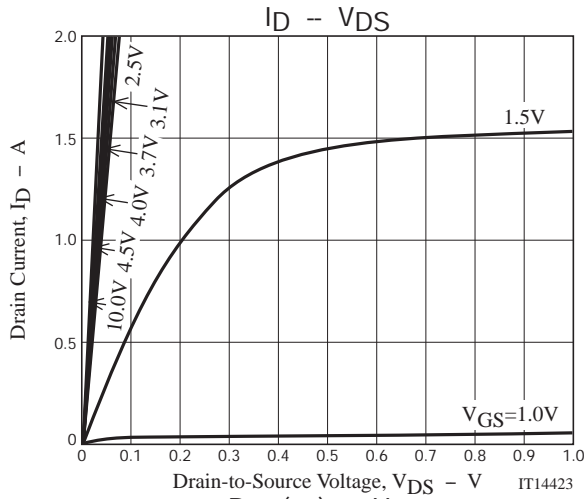
## Switching Time Test Circuit



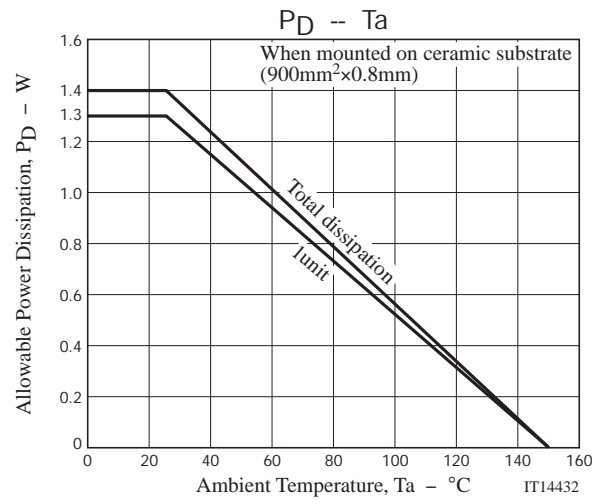
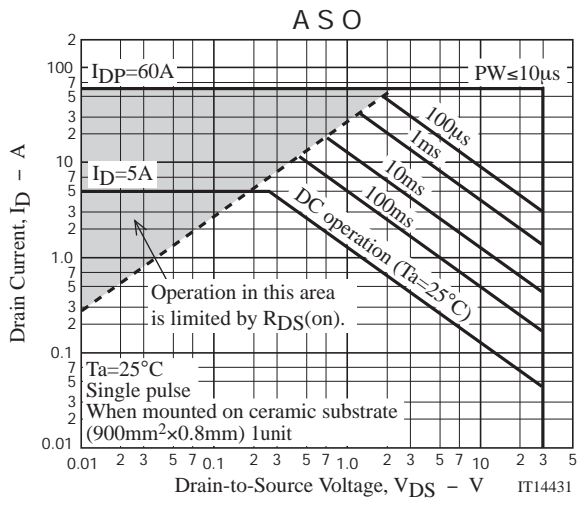
## Ordering Information

Device	Package	Shipping	memo
EMH2411R-TL-H	EMH8	3,000pcs./reel	Pb Free and Halogen Free

# EMH2411R



# EMH2411R



# EMH2411R

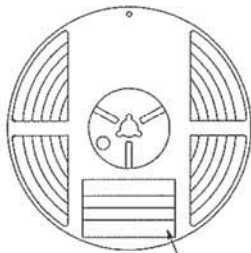
## Embossed Taping Specification

EMH2411R-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

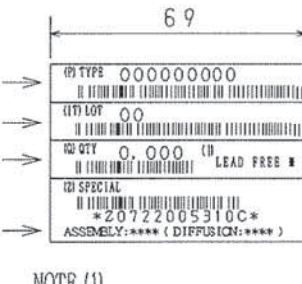
#### Packing method



Reel label

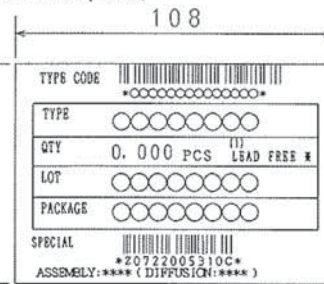
Type No. →  
LOT No. →  
Quantity →  
Origin →

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.



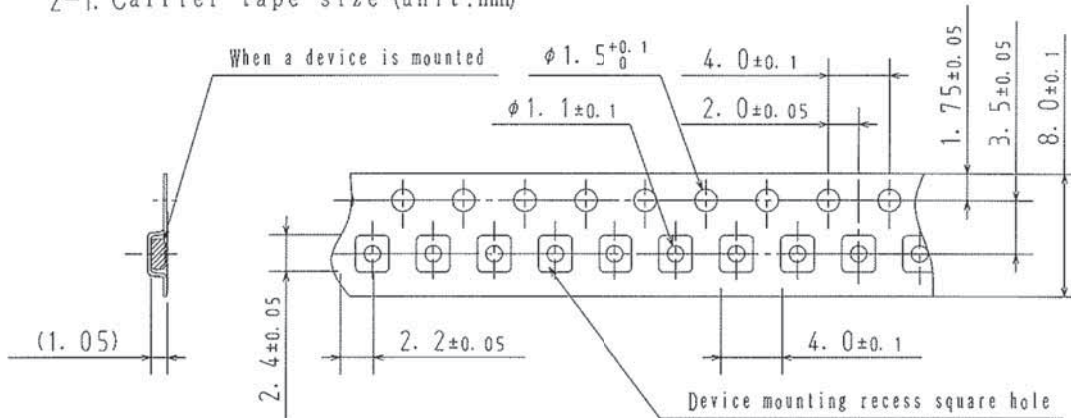
#### NOTE (1)

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

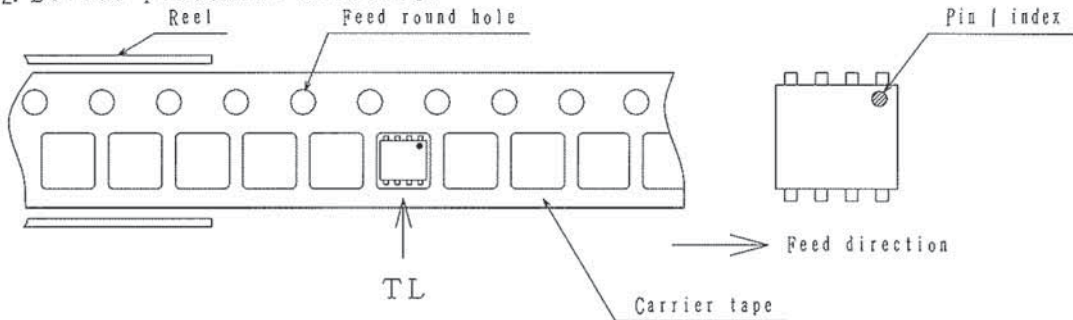
Label	JEITA Phase
LEAD FREE 3	JEITA Phase 3A
LEAD FREE 4	JEITA Phase 3

### 2. Taping configuration

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



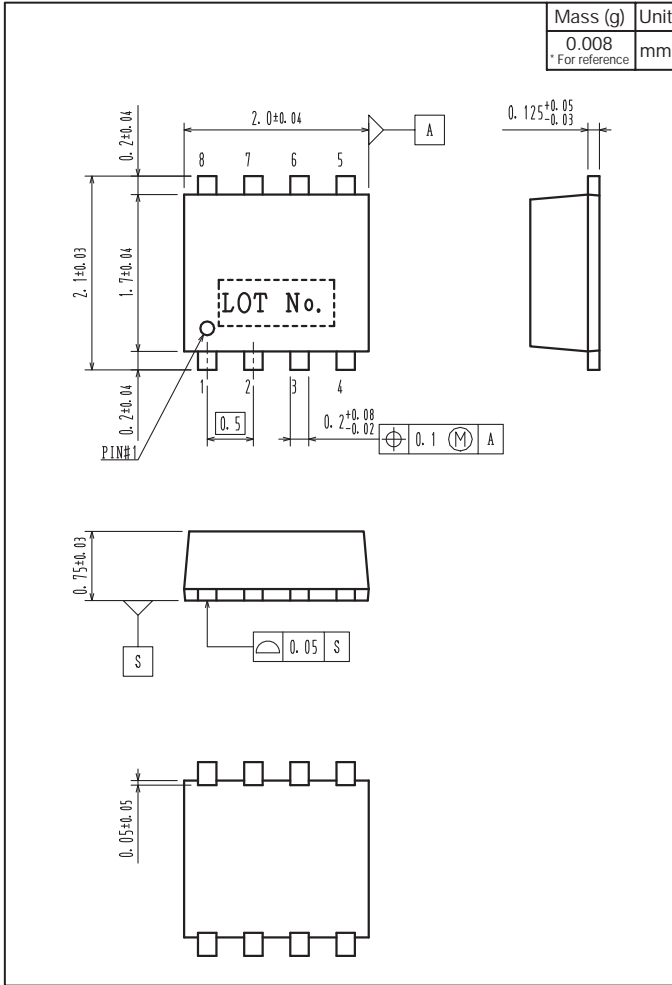
#### 2-2. Device placement direction



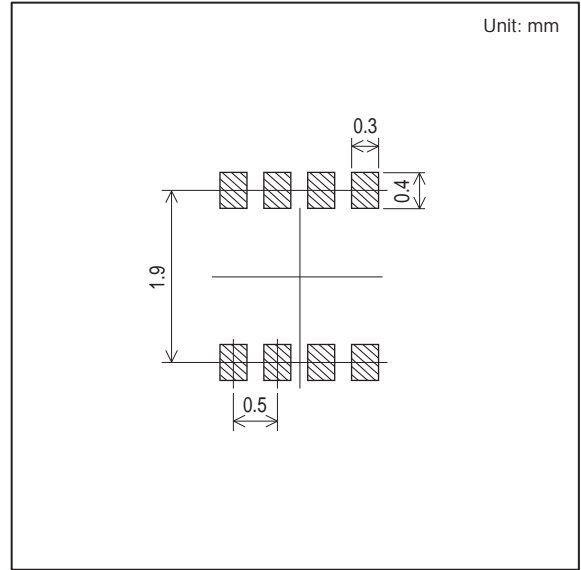
Those with pin | index on the feed hole side.....TL

# EMH2411R

## Outline Drawing EMH2411R-TL-H



## Land Pattern Example



Note on usage : Since the EMH2411R is a MOSFET product, please avoid using this device in the vicinity of highly charged objects.

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