



SANYO Semiconductors

# DATA SHEET

An ON Semiconductor Company

## 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

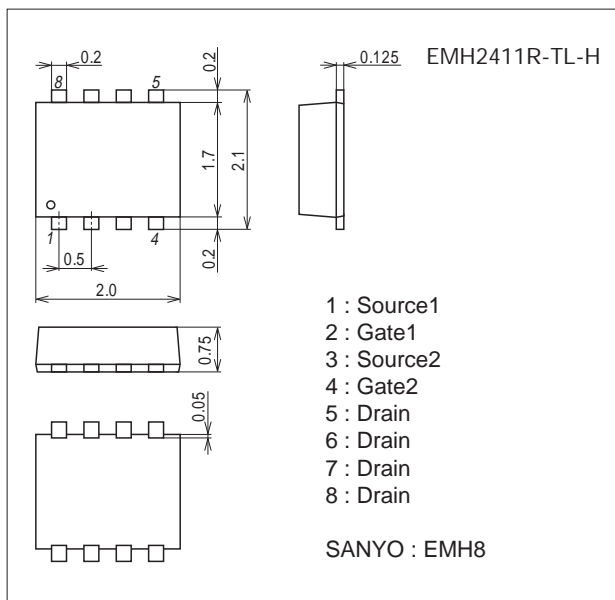
### Specifications

Absolute Maximum Ratings at Ta=25°C

Parameter	Symbol	Conditions	Ratings	Unit
Drain-to-Source Voltage	VDSS		30	V
Gate-to-Source Voltage	VGSS		±12	V
Drain Current (DC)	ID		5	A
Drain Current (Pulse)	IDP	PW≤10μs, duty cycle≤1%	60	A
Allowable Power Dissipation	PD	When mounted on ceramic substrate (900mm <sup>2</sup> ×0.8mm) 1unit	1.3	W
Total Dissipation	PT	When mounted on ceramic substrate (900mm <sup>2</sup> ×0.8mm)	1.4	W
Channel Temperature	Tch		150	°C
Storage Temperature	Tstg		-55 to +150	°C

### Package Dimensions

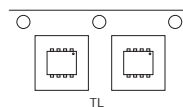
unit : mm (typ)  
7045-006



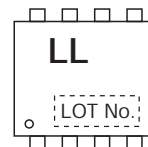
### Product & Package Information

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

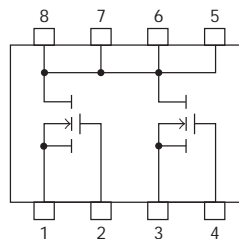
### Packing Type : TL



### Marking



### Electrical Connection

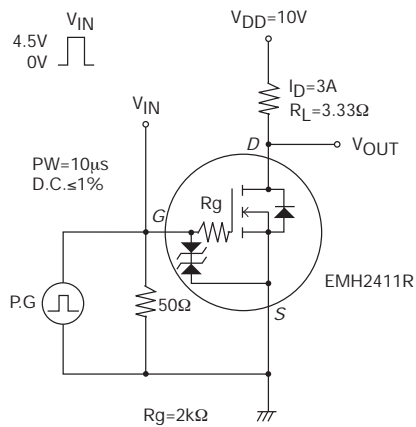


# EMH2411R

## Electrical Characteristics at Ta=25°C

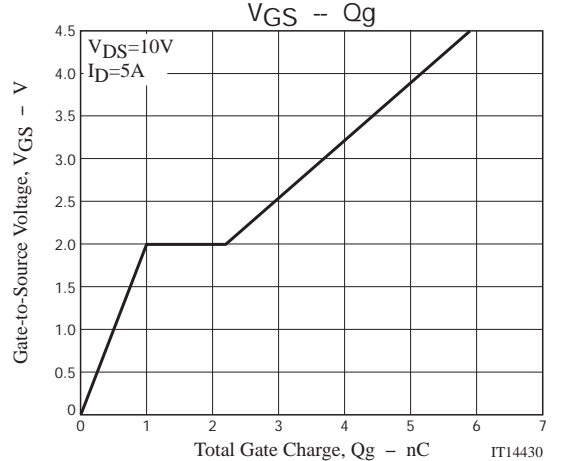
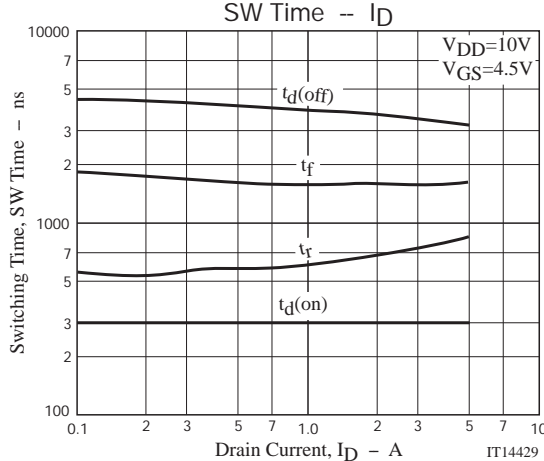
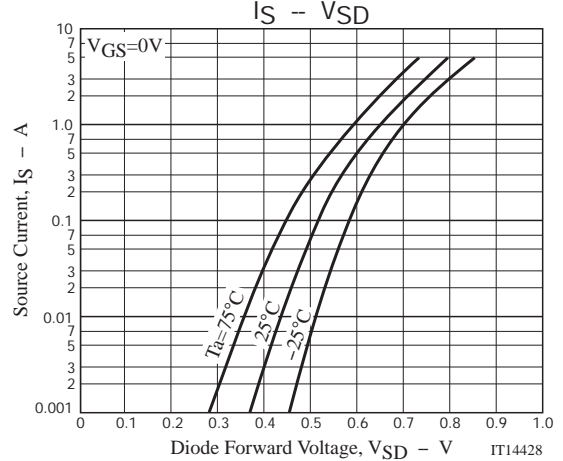
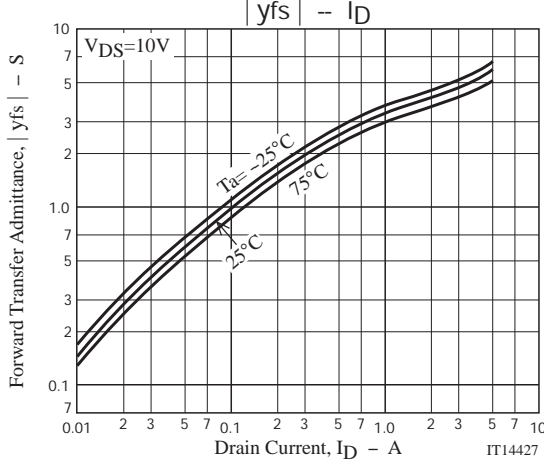
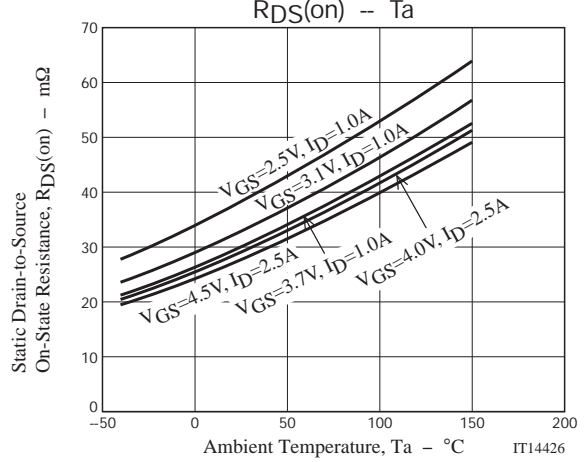
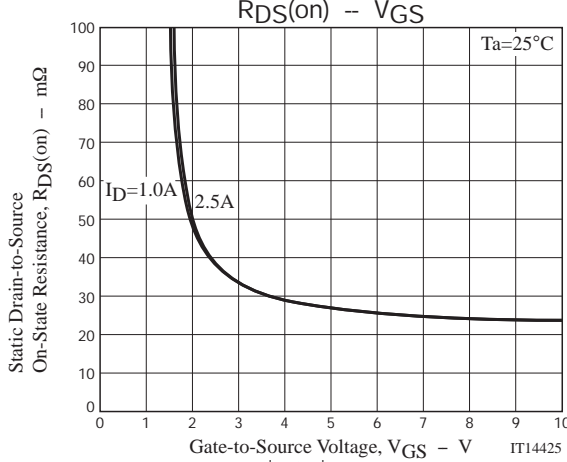
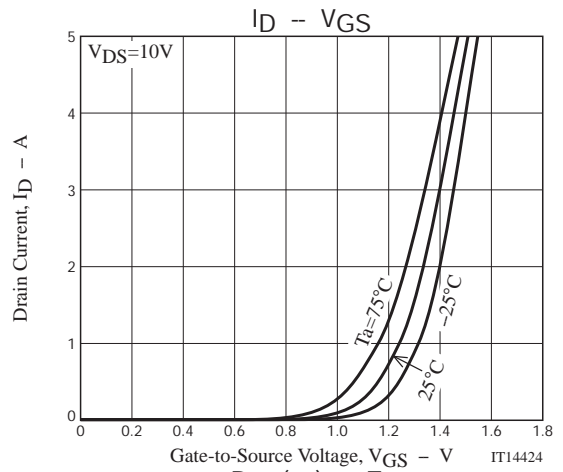
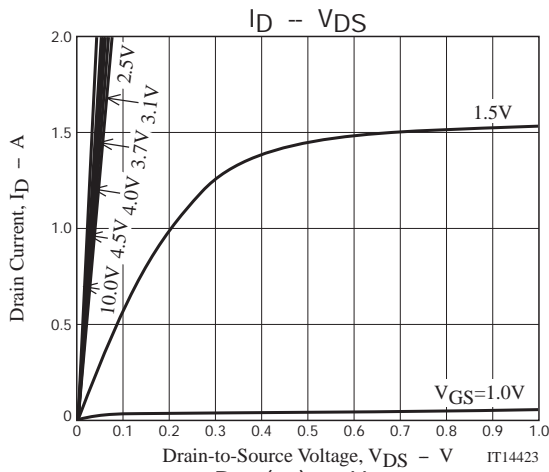
Parameter	Symbol	Conditions	Ratings			Unit
			min	typ	max	
Drain-to-Source Breakdown Voltage	V(BR)DSS	I <sub>D</sub> =1mA, V <sub>GS</sub> =0V	30			V
Zero-Gate Voltage Drain Current	I <sub>DSS</sub>	V <sub>DS</sub> =30V, V <sub>GS</sub> =0V			1	μA
Gate-to-Source Leakage Current	I <sub>GSS</sub>	V <sub>GS</sub> =±8V, V <sub>DS</sub> =0V			±10	μA
Cutoff Voltage	V <sub>GS(off)</sub>	V <sub>DS</sub> =10V, I <sub>D</sub> =1mA	0.5		1.3	V
Forward Transfer Admittance	y <sub>fs</sub>	V <sub>DS</sub> =10V, I <sub>D</sub> =3A	3	5		S
Static Drain-to-Source On-State Resistance	R <sub>DS(on)1</sub>	I <sub>D</sub> =2.5A, V <sub>GS</sub> =4.5V	19.5	28	36.5	mΩ
	R <sub>DS(on)2</sub>	I <sub>D</sub> =2.5A, V <sub>GS</sub> =4V	20	29	38	mΩ
	R <sub>DS(on)3</sub>	I <sub>D</sub> =1A, V <sub>GS</sub> =3.7V	21	30	39	mΩ
	R <sub>DS(on)4</sub>	I <sub>D</sub> =1A, V <sub>GS</sub> =3.1V	21	33	46.5	mΩ
	R <sub>DS(on)5</sub>	I <sub>D</sub> =1A, V <sub>GS</sub> =2.5V	22.5	38	54	mΩ
Turn-ON Delay Time	t <sub>d(on)</sub>	See specified Test Circuit.		300		ns
Rise Time	t <sub>r</sub>			840		ns
Turn-OFF Delay Time	t <sub>d(off)</sub>			3200		ns
Fall Time	t <sub>f</sub>			1650		ns
Total Gate Charge	Q <sub>g</sub>			5.9		nC
Gate-to-Source Charge	Q <sub>gs</sub>	V <sub>DS</sub> =10V, V <sub>GS</sub> =4.5V, I <sub>D</sub> =5A		1		nC
Gate-to-Drain "Miller" Charge	Q <sub>gd</sub>			1.2		nC
Diode Forward Voltage	V <sub>SD</sub>	I <sub>S</sub> =5A, V <sub>GS</sub> =0V		0.8	1.2	V

## Switching Time Test Circuit

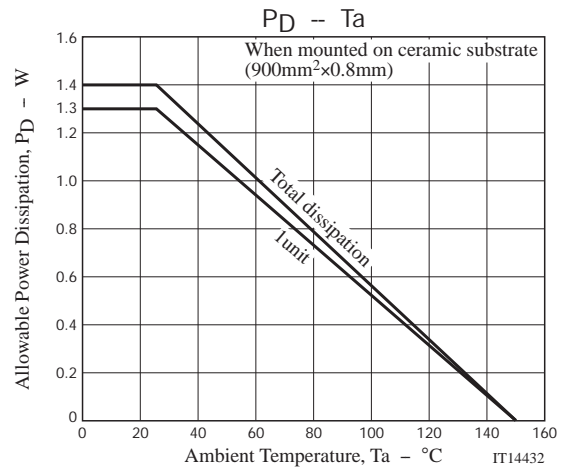
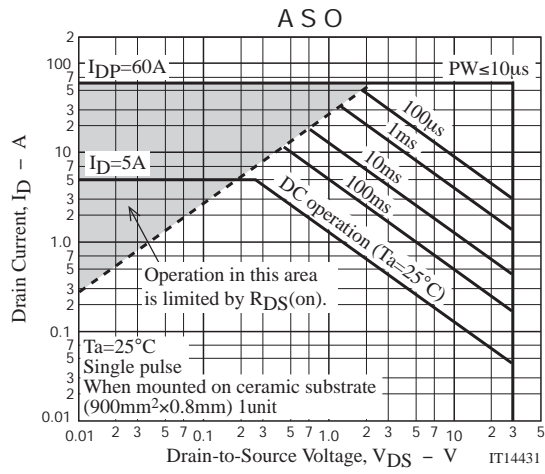


## Ordering Information

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



# EMH2411R



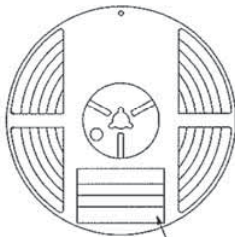
Embossed Taping Specification

EMH2411R-TL-H

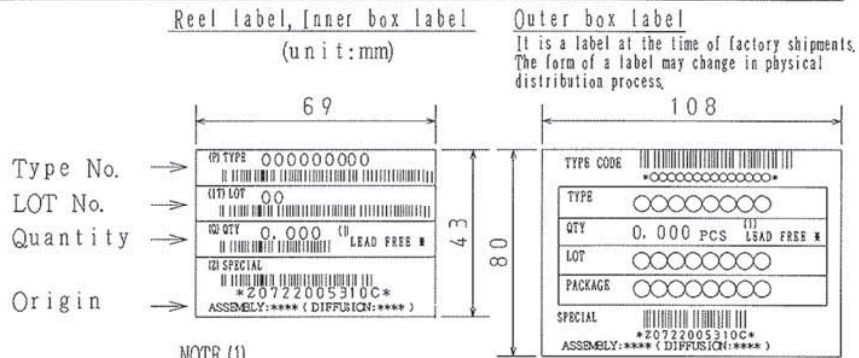
1. Packing Format

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



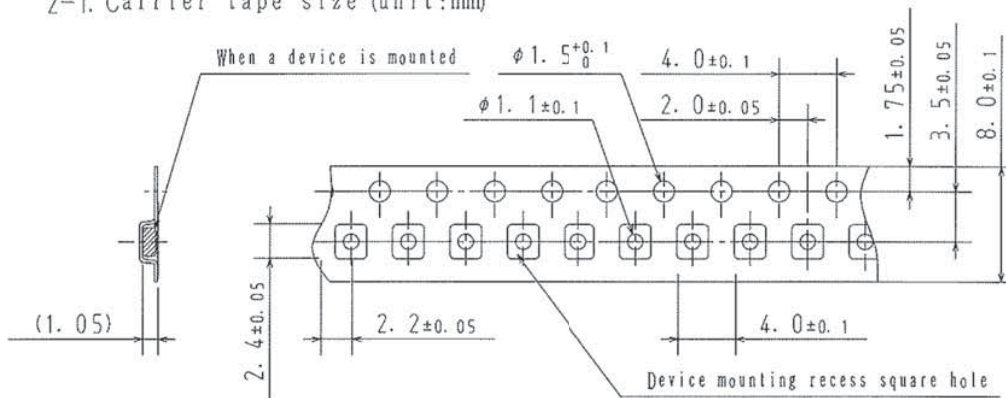
NOTE (1)

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

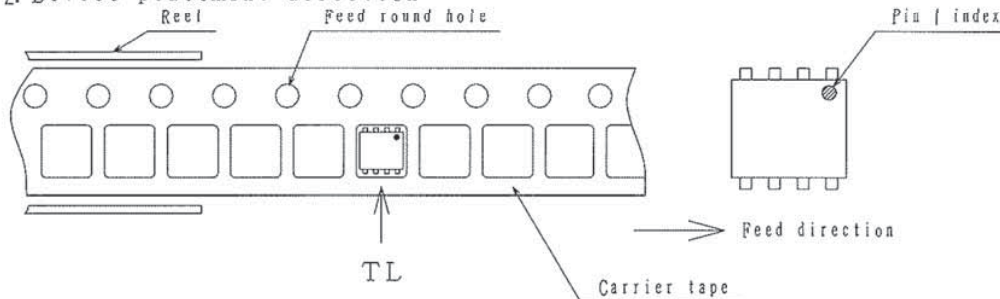
Label	JEITA Phase
LEAD FREE 3	JEITA Phase 3A
LEAD FREE 4	JEITA Phase 3

2. Taping configuration

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



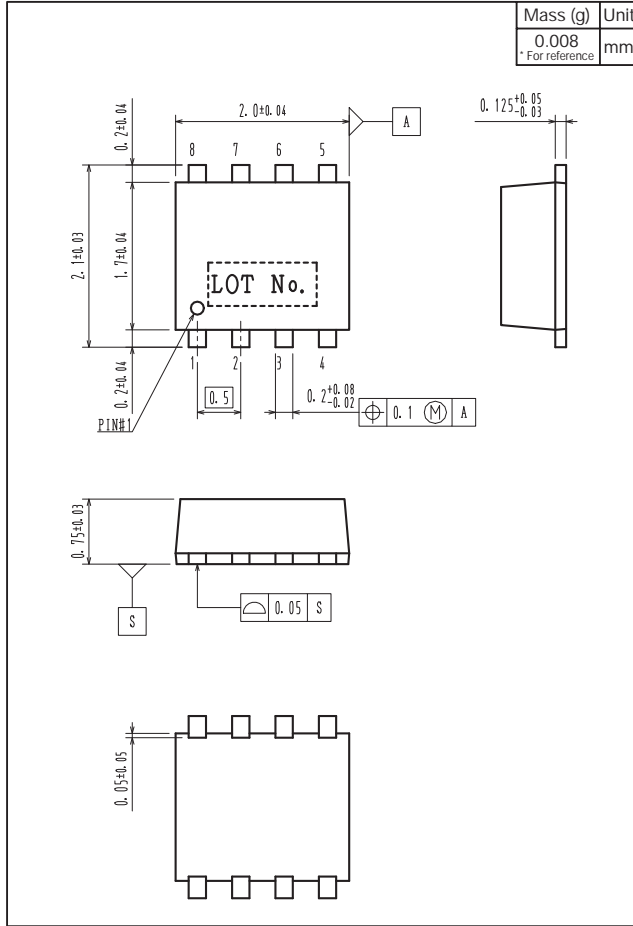
2-2. Device placement direction



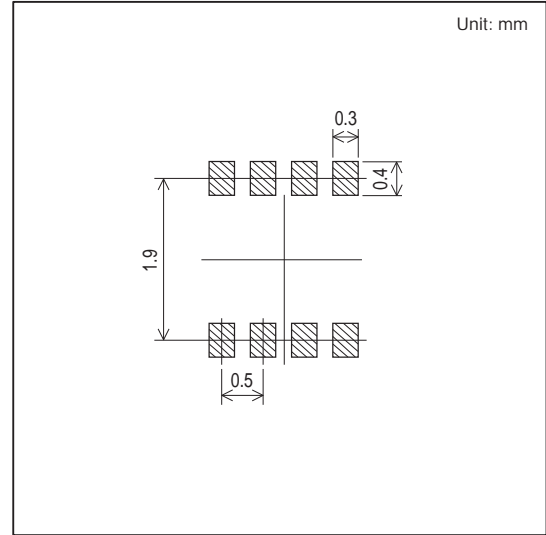
Those with pin | index on the feed hole side.....TL

# 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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