



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

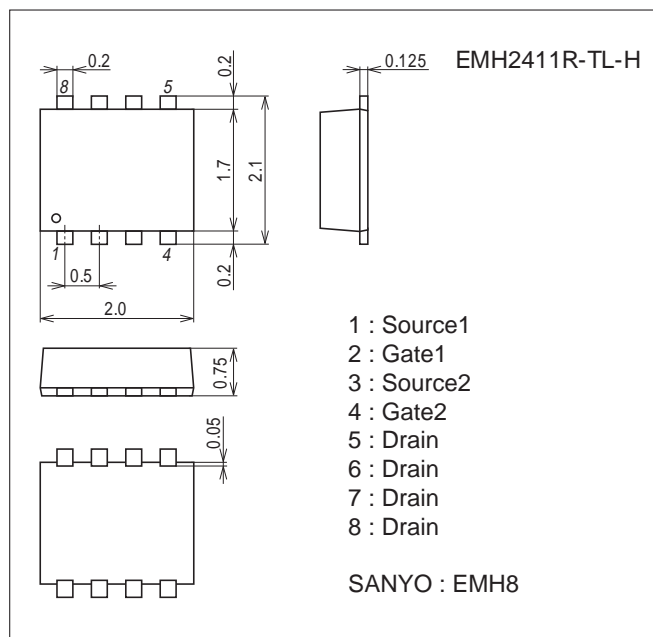
Absolute Maximum Ratings at Ta=25°C

Parameter	Symbol	Conditions	Ratings	Unit
Drain-to-Source Voltage	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)

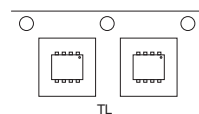
7045-006



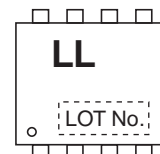
### Product & Package Information

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

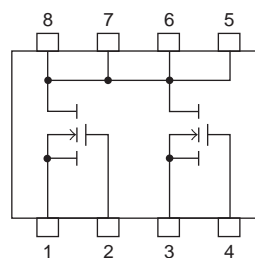
### Packing Type : TL



### Marking



### Electrical Connection

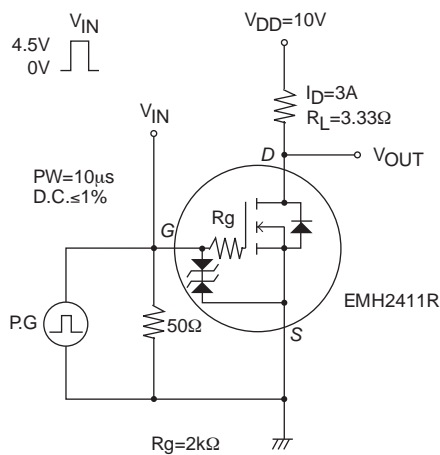


# EMH2411R

## Electrical Characteristics at Ta=25°C

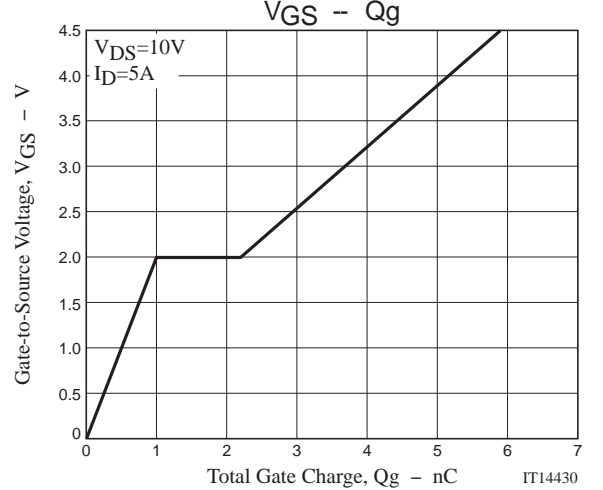
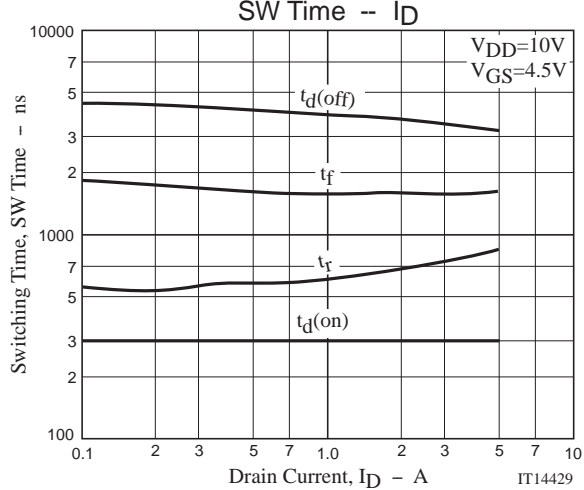
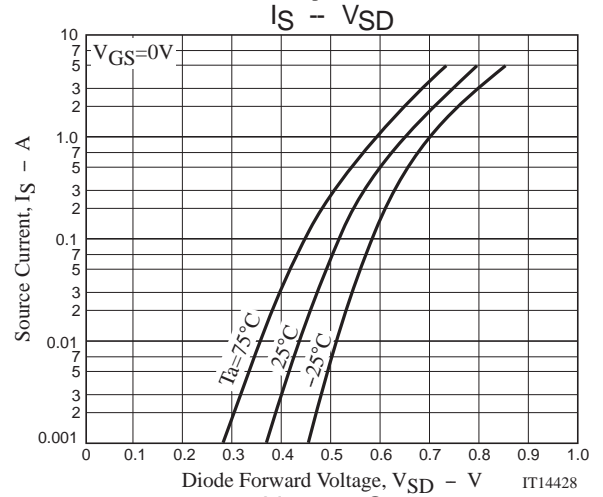
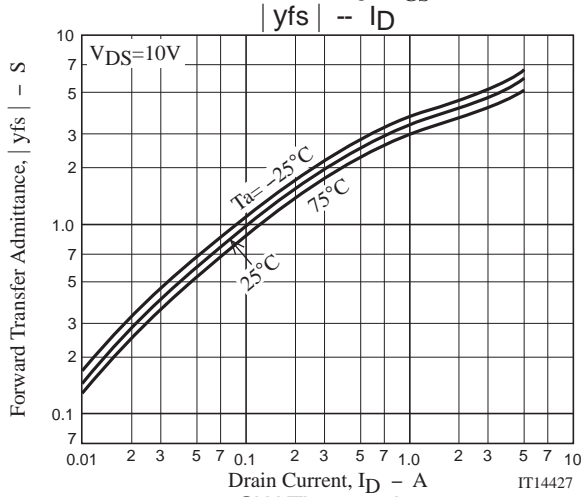
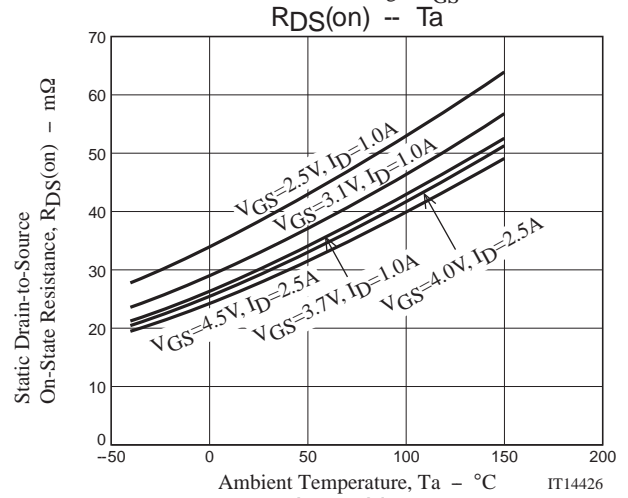
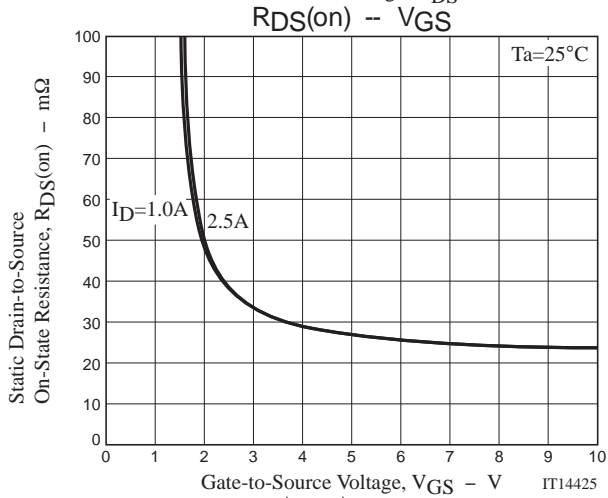
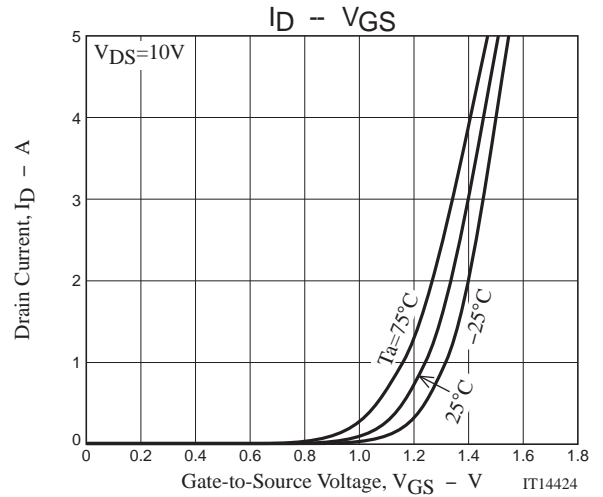
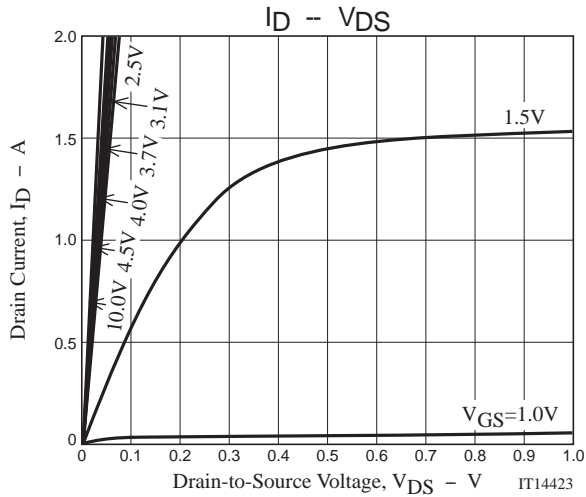
Parameter	Symbol	Conditions	Ratings			Unit
			min	typ	max	
Drain-to-Source Breakdown Voltage	$V_{(BR)DSS}$	$I_D=1mA, V_{GS}=0V$	30			V
Zero-Gate Voltage Drain Current	$I_{DSS}$	$V_{DS}=30V, V_{GS}=0V$			1	$\mu A$
Gate-to-Source Leakage Current	$I_{GSS}$	$V_{GS}=\pm 8V, V_{DS}=0V$			$\pm 10$	$\mu A$
Cutoff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

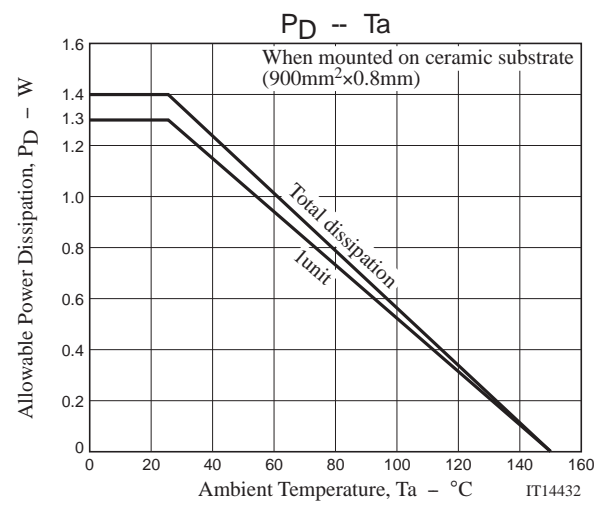
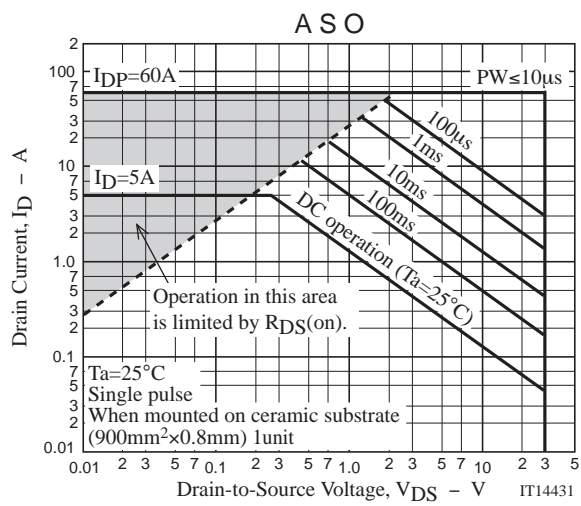
## Switching Time Test Circuit



## Ordering Information

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





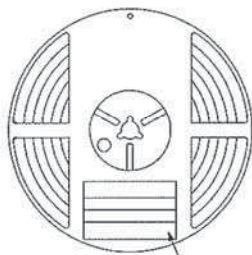
## Embossed Taping Specification

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)

TYPE	0000000000
LOT	00
QTY	0,000 (LEAD FREE)
SPECIAL	ASSEMBLY:**** (DIFFUSION:****)

Outer box label

It is a label at the time of factory shipments.  
The form of a label may change in physical  
distribution process.

TYPE CODE	0000000000
TYPE	00000000
QTY	0,000 PCS (LEAD FREE)
LOT	00000000
PACKAGE	00000000
SPECIAL	ASSEMBLY:**** (DIFFUSION:****)

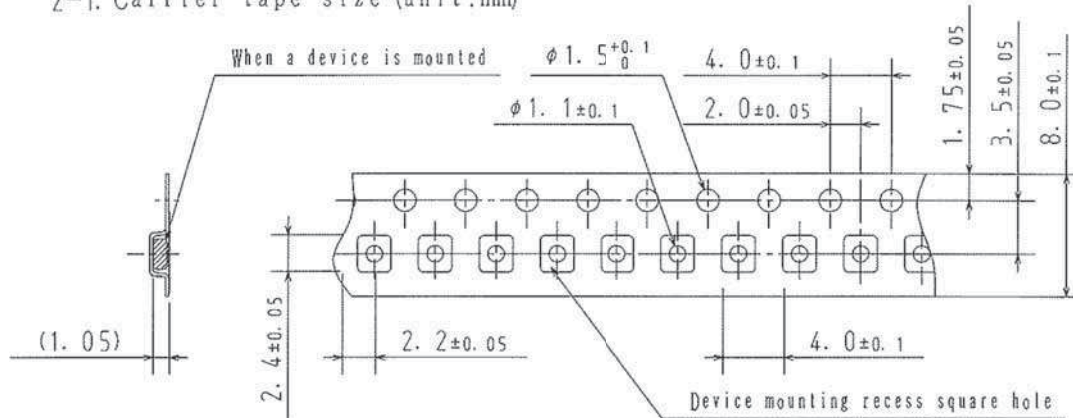
NOTE (1)

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

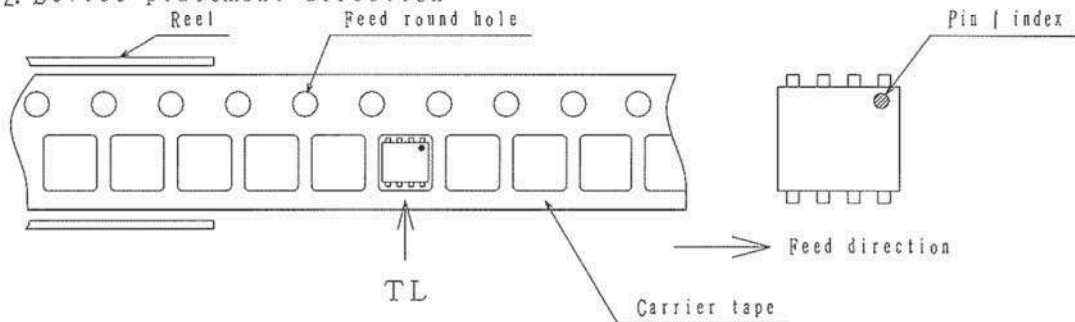
Label	JEITA Phase
LEAD FREE 3	JEITA Phase 3A
LEAD FREE 4	JEITA Phase 3

### 2. Taping configuration

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



#### 2-2. Device placement direction

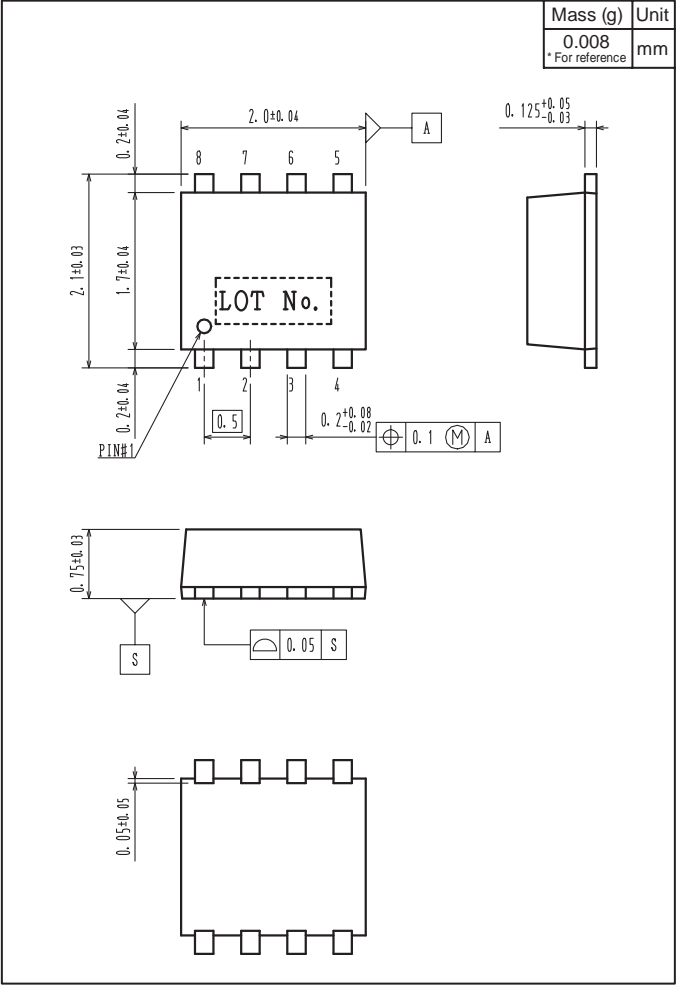


Those with pin 1 index on the feed hole side.....TL

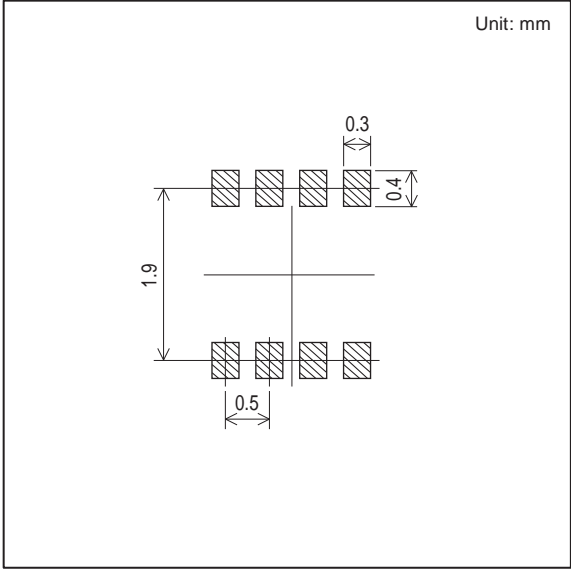
EMH2411R

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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