



# N-Channel Power MOSFET

## 30V, 5A, 36.5mΩ, Dual EMH8

ON Semiconductor®

<http://onsemi.com>

## 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

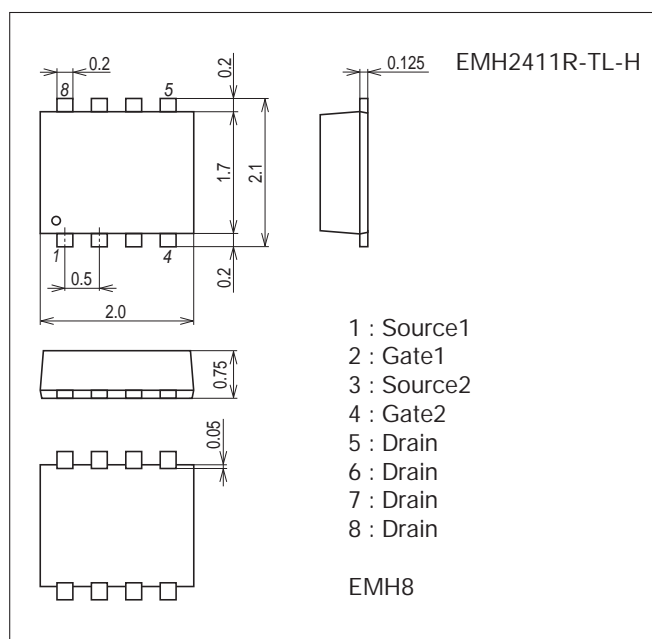
Parameter	Symbol	Conditions	Ratings	Unit
Drain-to-Source Voltage	V <sub>DSS</sub>		30	V
Gate-to-Source Voltage	V <sub>GSS</sub>		±12	V
Drain Current (DC)	I <sub>D</sub>		5	A
Drain Current (Pulse)	I <sub>DP</sub>	PW≤10μs, duty cycle≤1%	60	A
Allowable Power Dissipation	P <sub>D</sub>	When mounted on ceramic 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

Stresses exceeding Maximum Ratings may damage the device. Maximum Ratings are stress ratings only. Functional operation above the Recommended Operating Conditions is not implied. Extended exposure to stresses above the Recommended Operating Conditions may affect device reliability.

## Package Dimensions

unit : mm (typ)

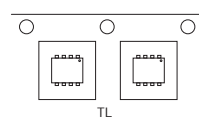
7045-006



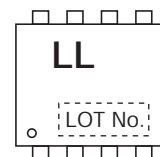
## Product & Package Information

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

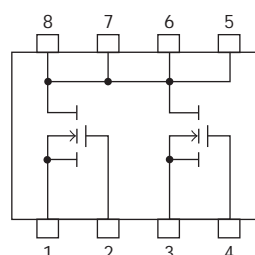
## Packing Type : TL



### Marking



## Electrical Connection

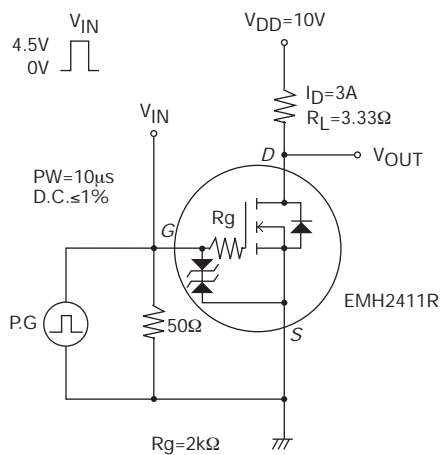


# EMH2411R

## Electrical Characteristics at Ta=25°C

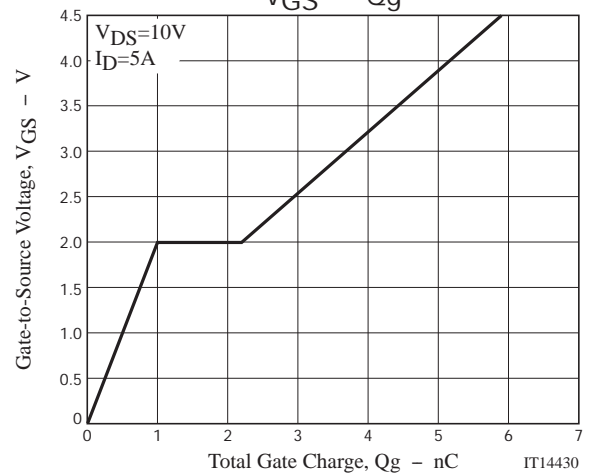
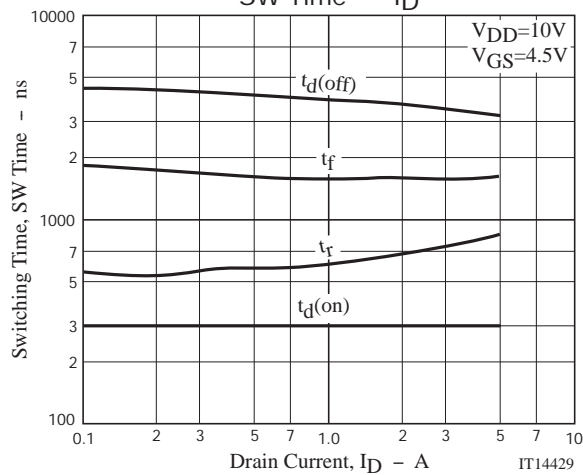
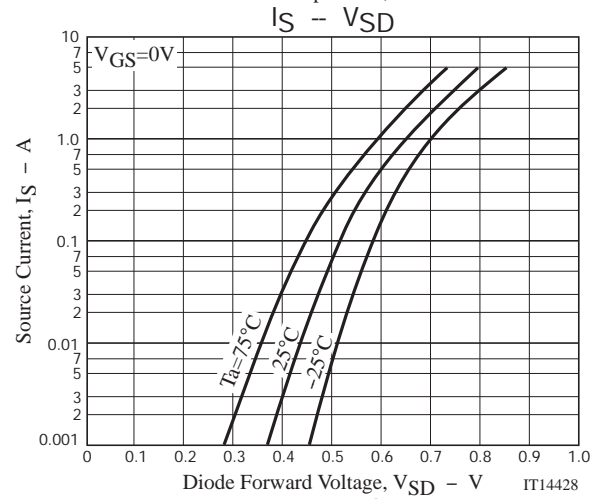
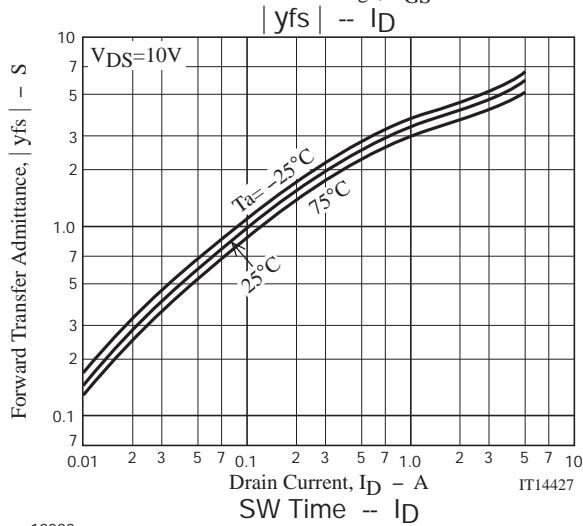
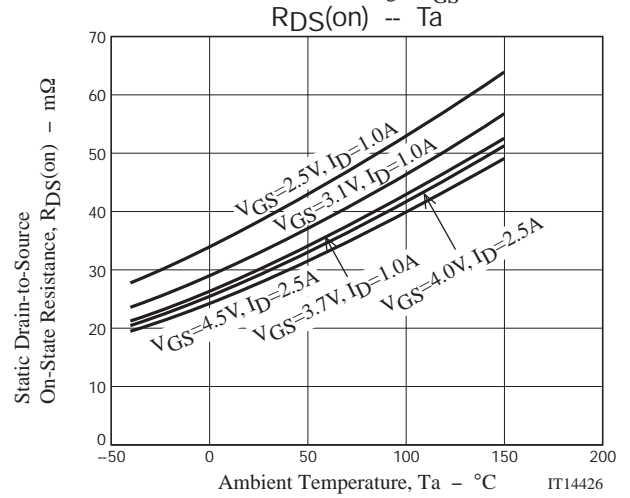
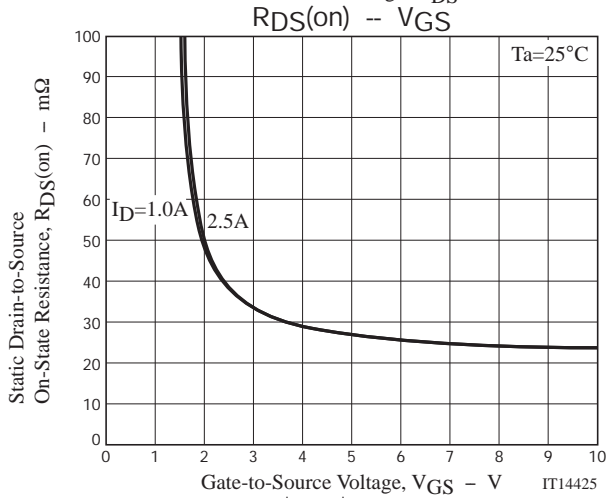
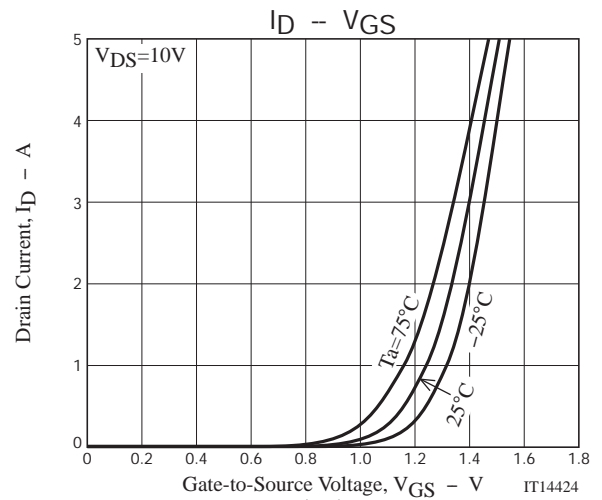
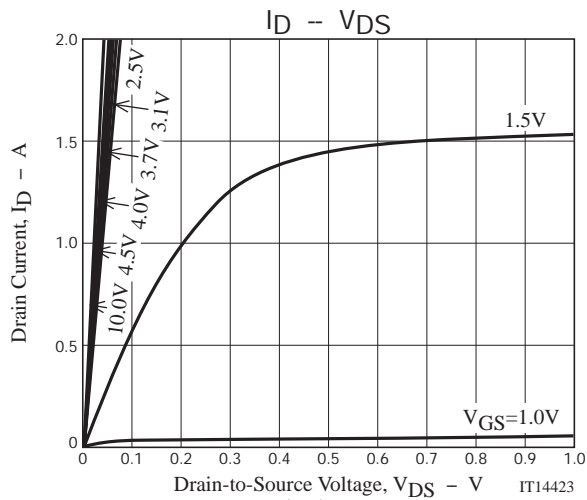
Parameter	Symbol	Conditions	Ratings			Unit
			min	typ	max	
Drain-to-Source Breakdown Voltage	$V_{(BR)DSS}$	$I_D=1mA, V_{GS}=0V$	30			V
Zero-Gate Voltage Drain Current	$I_{DSS}$	$V_{DS}=30V, V_{GS}=0V$			1	$\mu A$
Gate-to-Source Leakage Current	$I_{GSS}$	$V_{GS}=\pm 8V, V_{DS}=0V$			$\pm 10$	$\mu A$
Cutoff 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

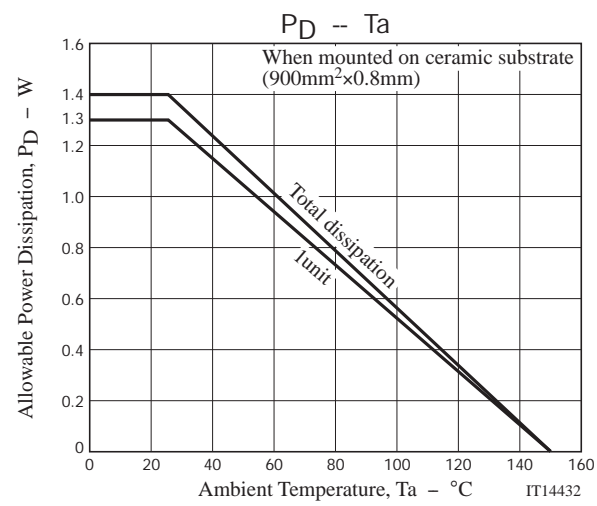
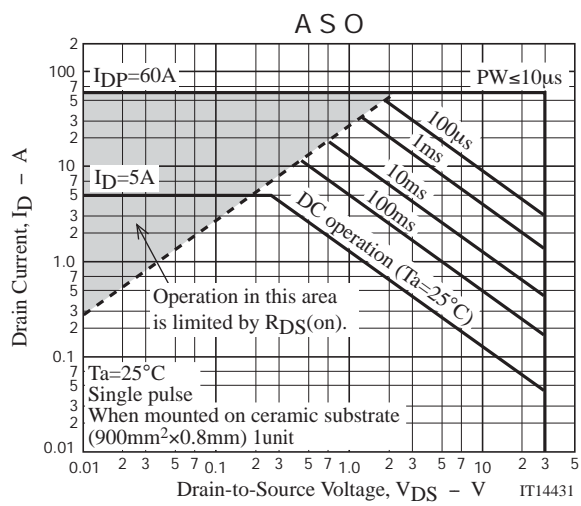
## Switching Time Test Circuit



## Ordering Information

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





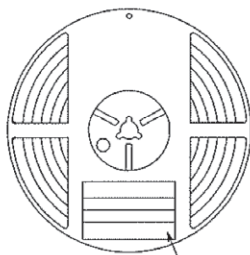
# Embossed Taping Specification

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

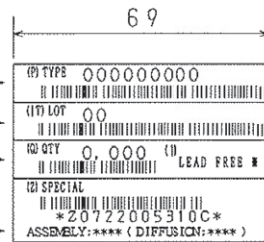
### Packing method



Reel label

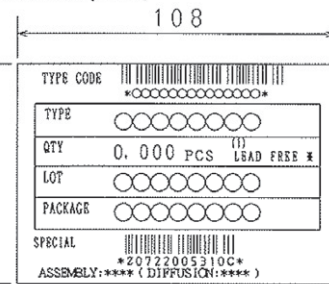
Type No.  
LOT No.  
Quantity  
Origin

Reel label, Inner box label  
(unit:mm)



Outer box label

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



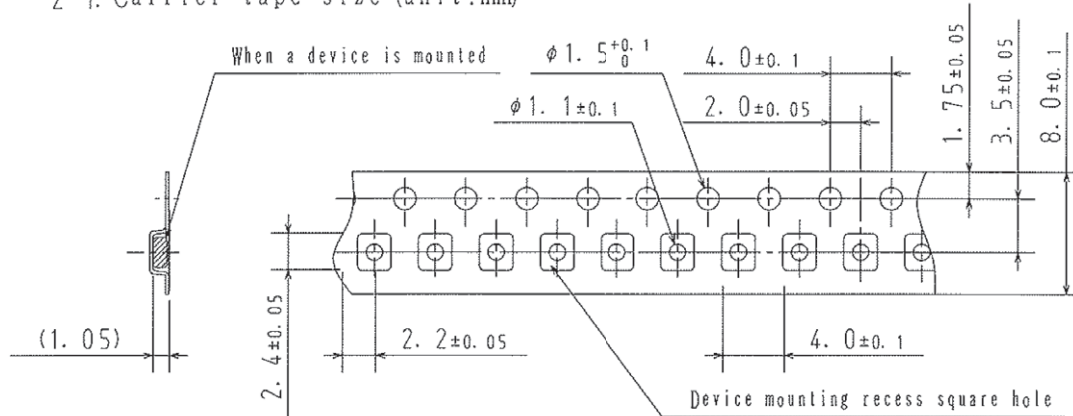
#### NOTE (1)

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

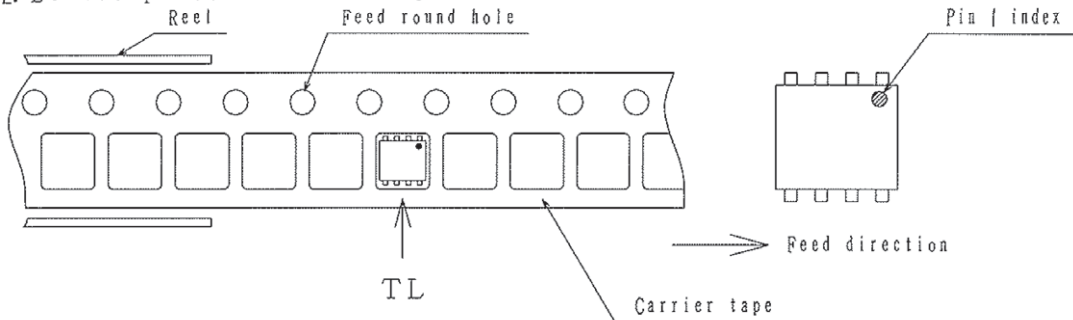
Label	JEITA Phase
LEAD FREE 3	JEITA Phase 3A
LEAD FREE 4	JEITA Phase 3

## 2. Taping configuration

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



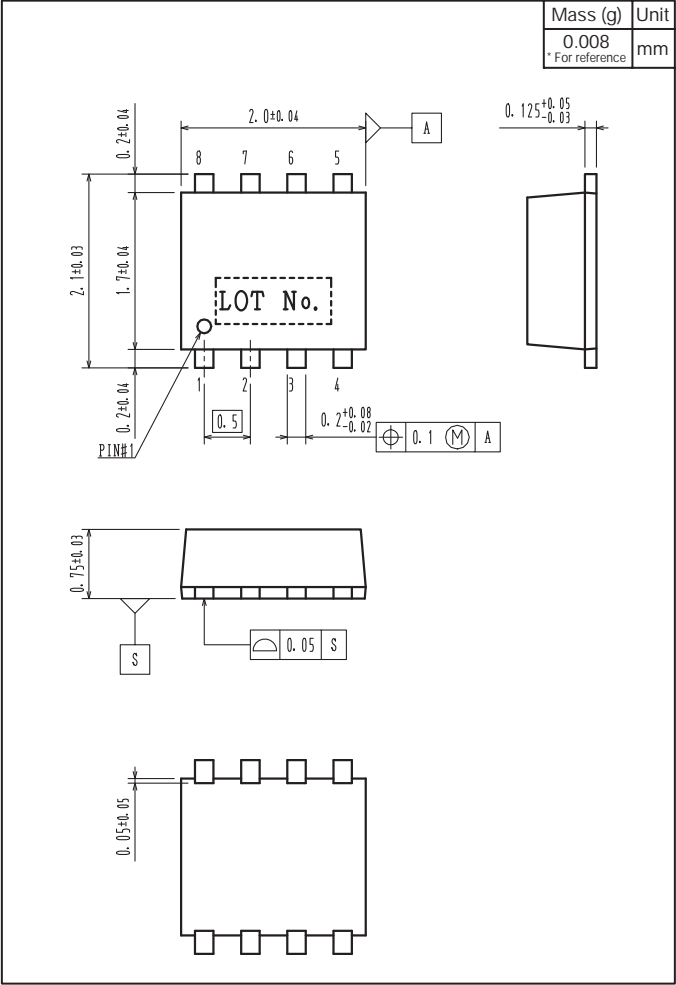
### 2-2. Device placement direction



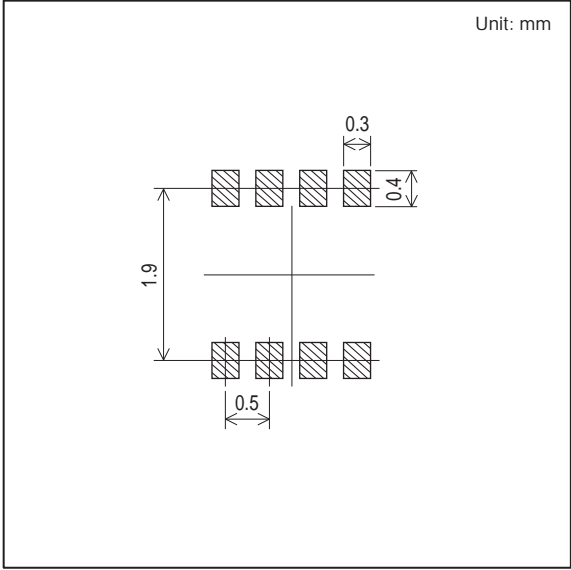
Those with pin 1 index on the feed hole side.....TL

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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