

Power MOSFET

20V, 4A, 45mΩ, -20V, -3A, 85mΩ, Complementary Dual EMH8

<http://onsemi.com>

- Nch + Pch MOSFET
- ON-resistance Nch : $R_{DS(on)1}=34m\Omega(\text{typ.})$
 Pch : $R_{DS(on)1}=65m\Omega(\text{typ.})$
- 1.8V drive
- Halogen free compliance

Absolute Maximum Ratings at Ta=25°C

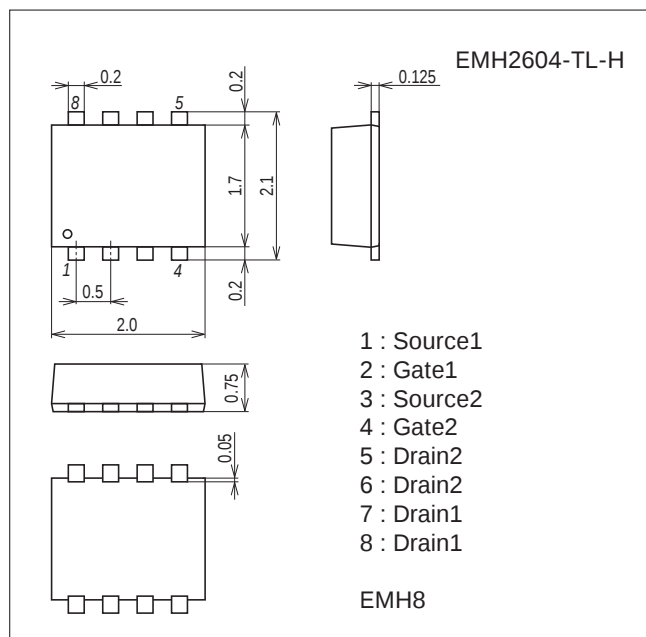
Parameter	Symbol	Conditions	N-channel	P-channel	Unit
Drain-to-Source Voltage	V _{DSS}		20	-20	V
Gate-to-Source Voltage	V _{GSS}		±10	±10	V
Drain Current (DC)	I _D		4	-3	A
Drain Current (Pulse)	I _{DP}	PW≤10μs, duty cycle≤1%	20	-20	A
Allowable Power Dissipation	P _D	When mounted on ceramic substrate (900mm ² ×0.8mm) 1unit	1.0		W
Total Dissipation	P _T	When mounted on ceramic substrate (900mm ² ×0.8mm)	1.2		W
Channel Temperature	T _{ch}		150		°C
Storage Temperature	T _{stg}		-55 to +150		°C

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

* Machine Model

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.

unit : mm (typ)
7045-002



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

FD

LOT No.

EMH2604

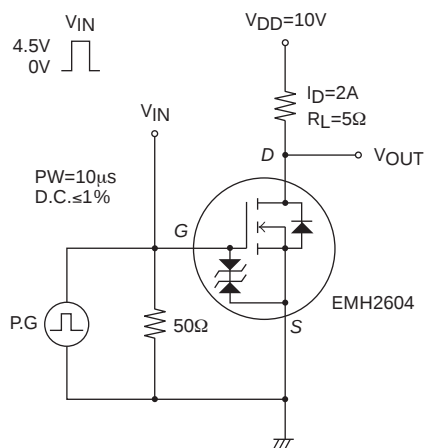
Electrical Characteristics at Ta=25°C

Parameter	Symbol	Conditions	Ratings			Unit
			min	typ	max	
[N-channel]						
Drain-to-Source Breakdown Voltage	V(BR)DSS	I _D =1mA, V _{GS} =0V	20			V
Zero-Gate Voltage Drain Current	I _{DSS}	V _{DS} =20V, V _{GS} =0V			1	μA
Gate-to-Source Leakage Current	I _{GSS}	V _{GS} =±8V, V _{DS} =0V			±10	μA
Cutoff Voltage	V _{GS(off)}	V _{DS} =10V, I _D =1mA	0.4		1.3	V
Forward Transfer Admittance	y _{fs}	V _{DS} =10V, I _D =2A		3.4		S
Static Drain-to-Source On-State Resistance	R _{DS(on)1}	I _D =4A, V _{GS} =4.5V		34	45	mΩ
	R _{DS(on)2}	I _D =1A, V _{GS} =2.5V		49	67	mΩ
	R _{DS(on)3}	I _D =0.5A, V _{GS} =1.8V		74	115	mΩ
Input Capacitance	C _{iss}	V _{DS} =10V, f=1MHz		345		pF
Output Capacitance	C _{oss}			67		pF
Reverse Transfer Capacitance	C _{rss}			52		pF
Turn-ON Delay Time	t _{d(on)}	See specified Test Circuit.		9.2		ns
Rise Time	t _r			60		ns
Turn-OFF Delay Time	t _{d(off)}			30		ns
Fall Time	t _f			38		ns
Total Gate Charge	Q _g	V _{DS} =10V, V _{GS} =4.5V, I _D =4A		4.7		nC
Gate-to-Source Charge	Q _{gs}			0.65		nC
Gate-to-Drain “Miller” Charge	Q _{gd}			1.6		nC
Diode Forward Voltage	V _{SD}	I _S =4A, V _{GS} =0V		0.8	1.2	V
[P-channel]						
Drain-to-Source Breakdown Voltage	V(BR)DSS	I _D =-1mA, V _{GS} =0V	-20			V
Zero-Gate Voltage Drain Current	I _{DSS}	V _{DS} =-20V, V _{GS} =0V			-1	μA
Gate-to-Source Leakage Current	I _{GSS}	V _{GS} =±8V, V _{DS} =0V			±10	μA
Cutoff Voltage	V _{GS(off)}	V _{DS} =-10V, I _D =-1mA	-0.4		-1.3	V
Forward Transfer Admittance	y _{fs}	V _{DS} =-10V, I _D =-1.5A		3.6		S
Static Drain-to-Source On-State Resistance	R _{DS(on)1}	I _D =-3A, V _{GS} =-4.5V		65	85	mΩ
	R _{DS(on)2}	I _D =-1A, V _{GS} =-2.5V		98	137	mΩ
	R _{DS(on)3}	I _D =-0.5A, V _{GS} =-1.8V		155	235	mΩ
Input Capacitance	C _{iss}	V _{DS} =-10V, f=1MHz		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		ns
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} =-10V, V _{GS} =-4.5V, I _D =-3A		4.0		nC
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 =-3A, V _{GS} =0V		-0.83	-1.2	V

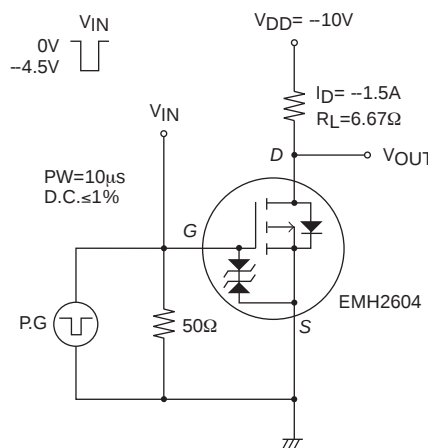
EMH2604

Switching Time Test Circuit

[N-channel]

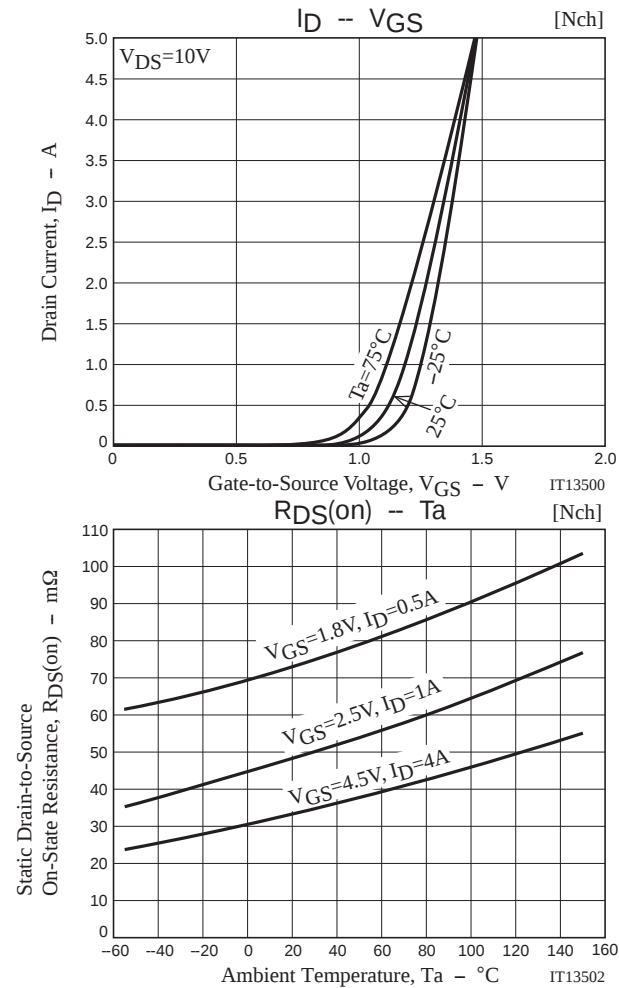
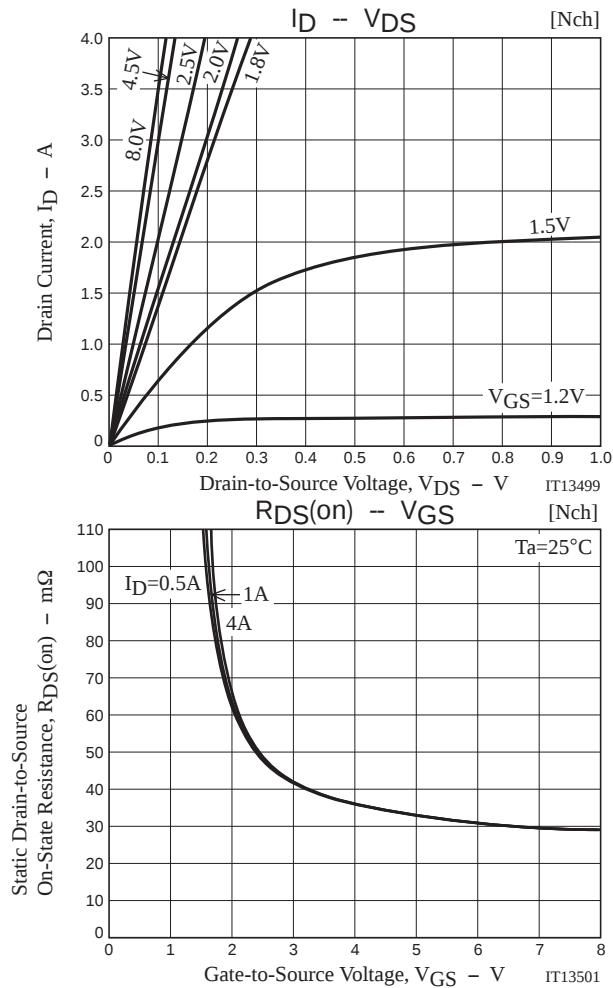


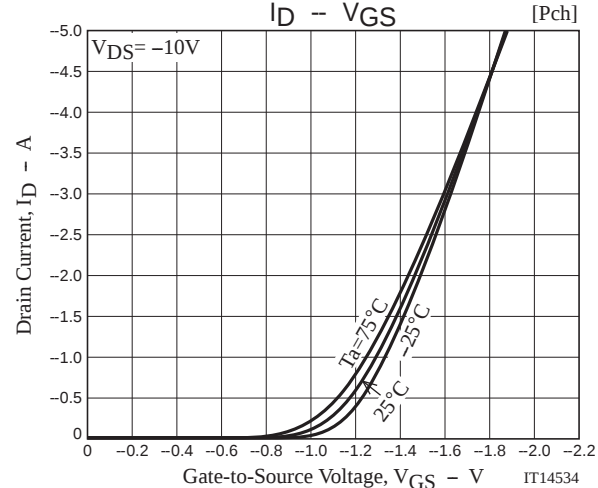
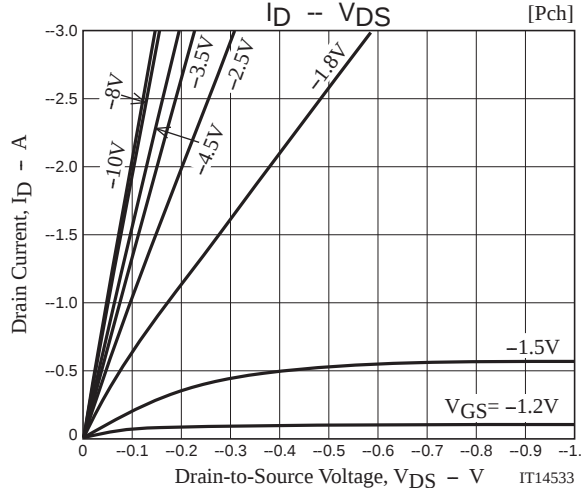
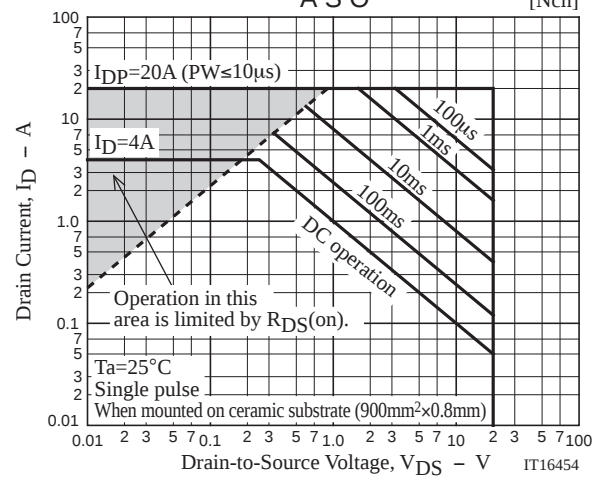
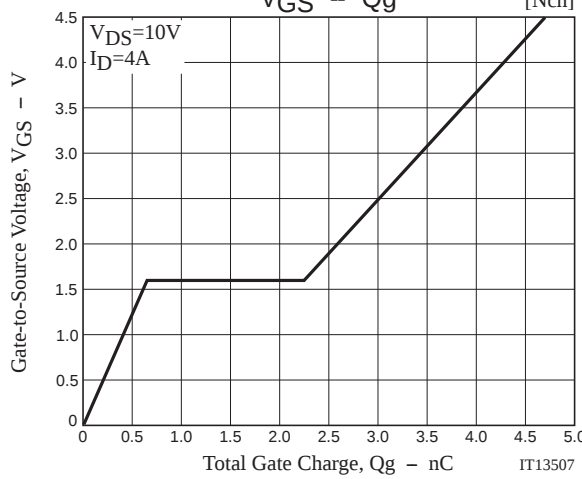
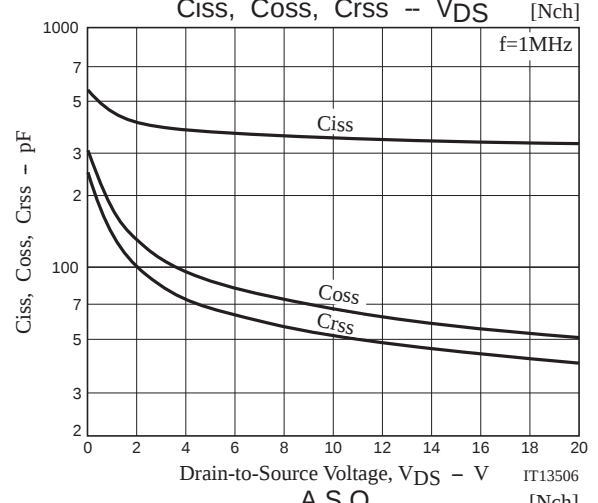
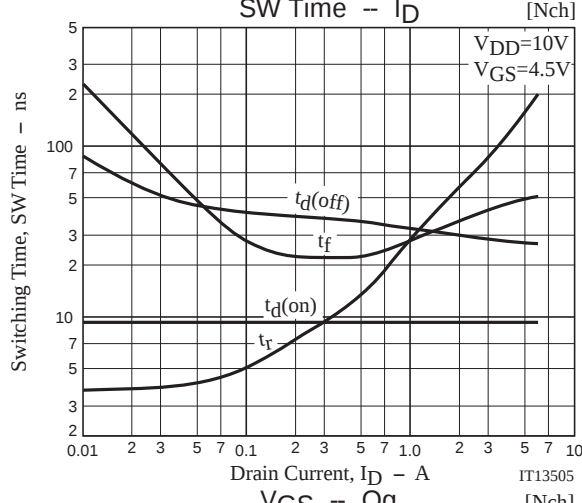
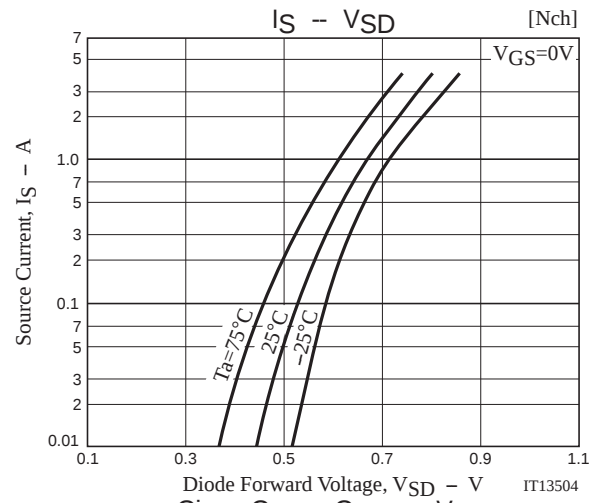
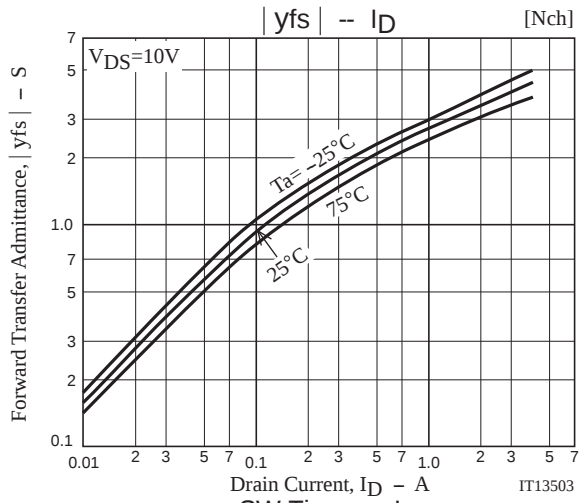
[P-channel]

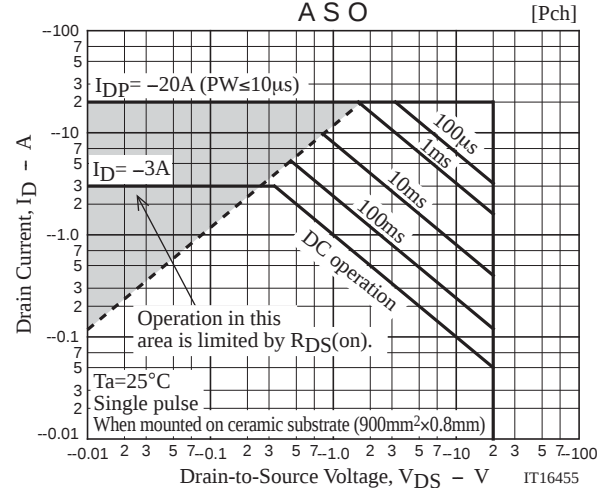
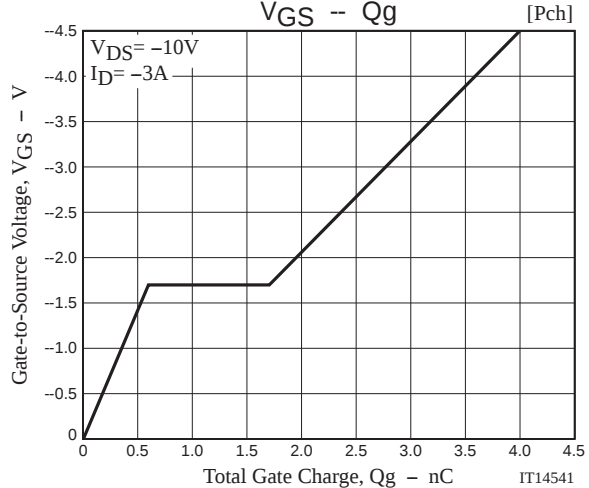
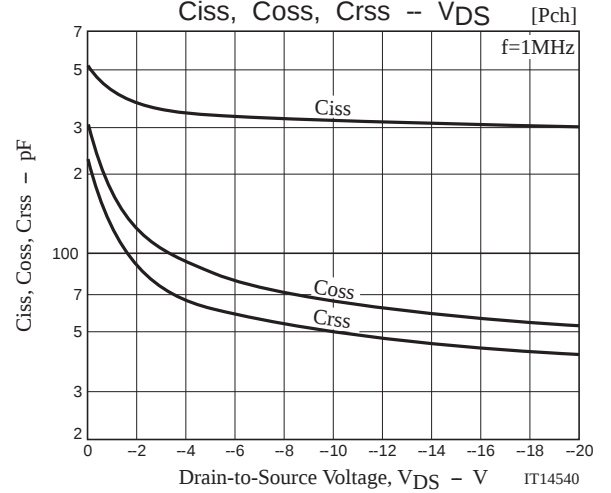
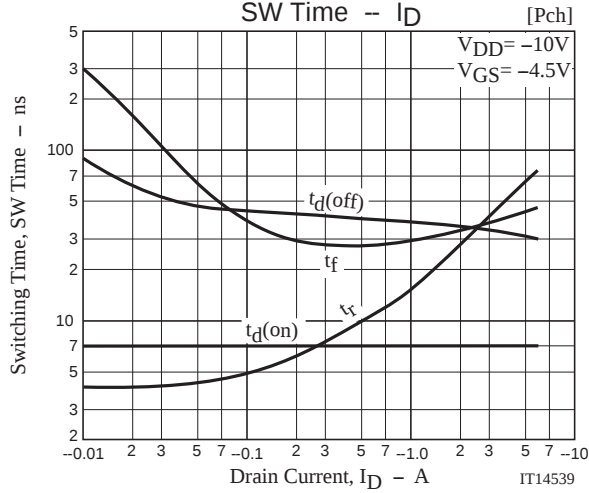
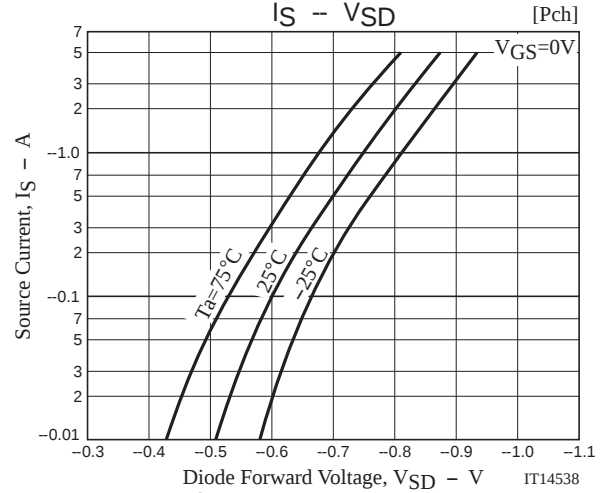
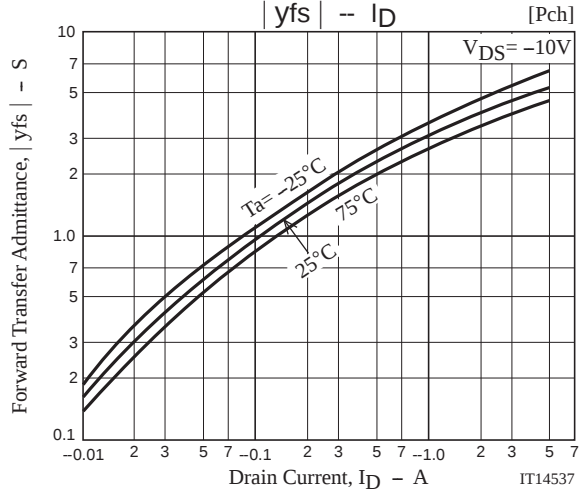
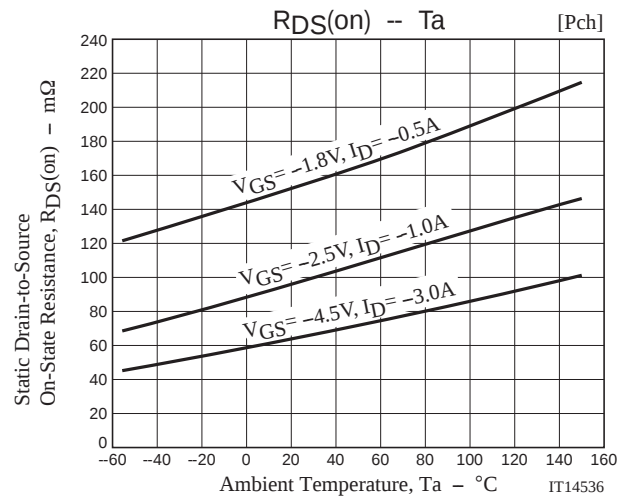
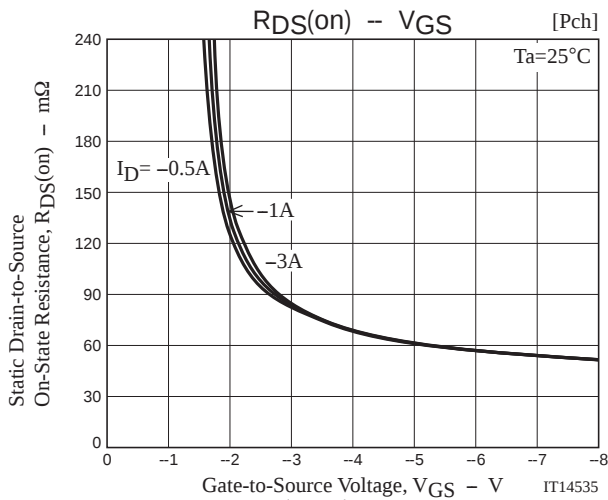


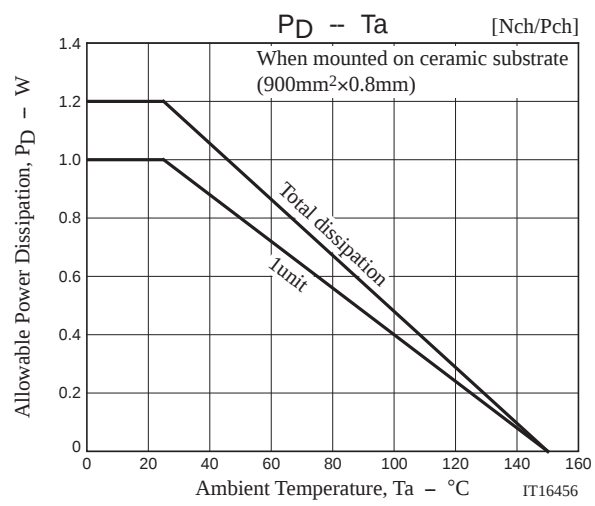
Ordering Information

Device	Package	Shipping	memo
EMH2604-TL-H	EMH8	3,000pcs./reel	Pb Free and Halogen Free









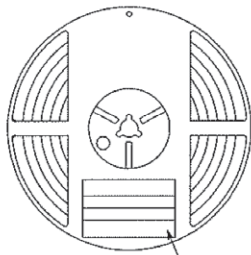
Embossed Taping Specification

EMH2604-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

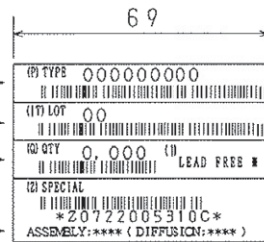
Packing method



Type No.
LOT No.
Quantity
Origin

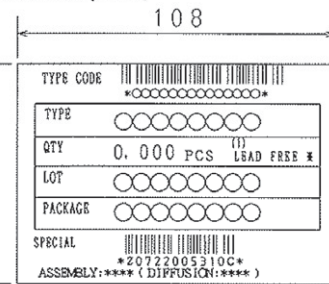
Reel label

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.



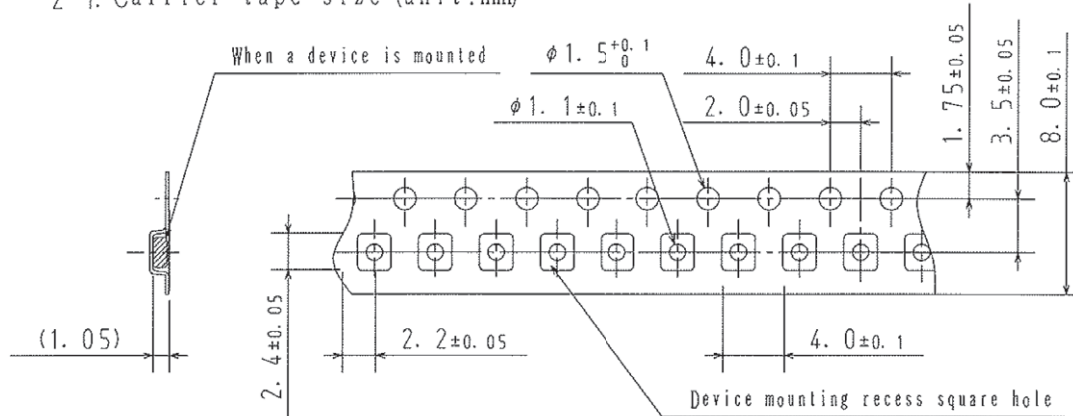
NOTE (1)

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

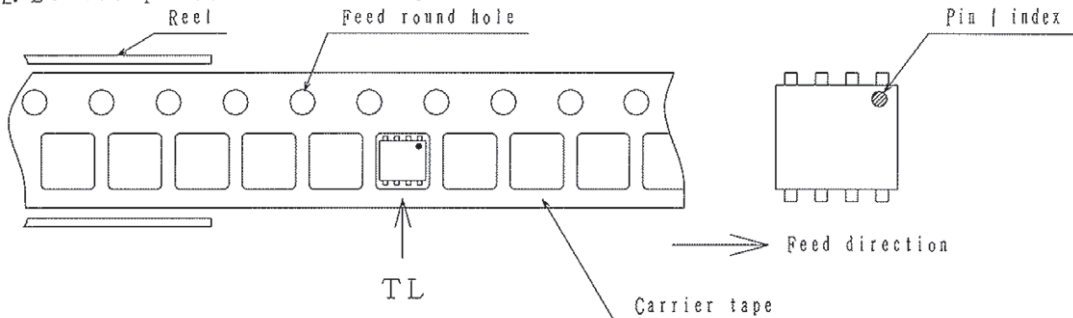
Label	JEITA Phase
LEAD FREE 3	JEITA Phase 3A
LEAD FREE 4	JEITA Phase 3

2. Taping configuration

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



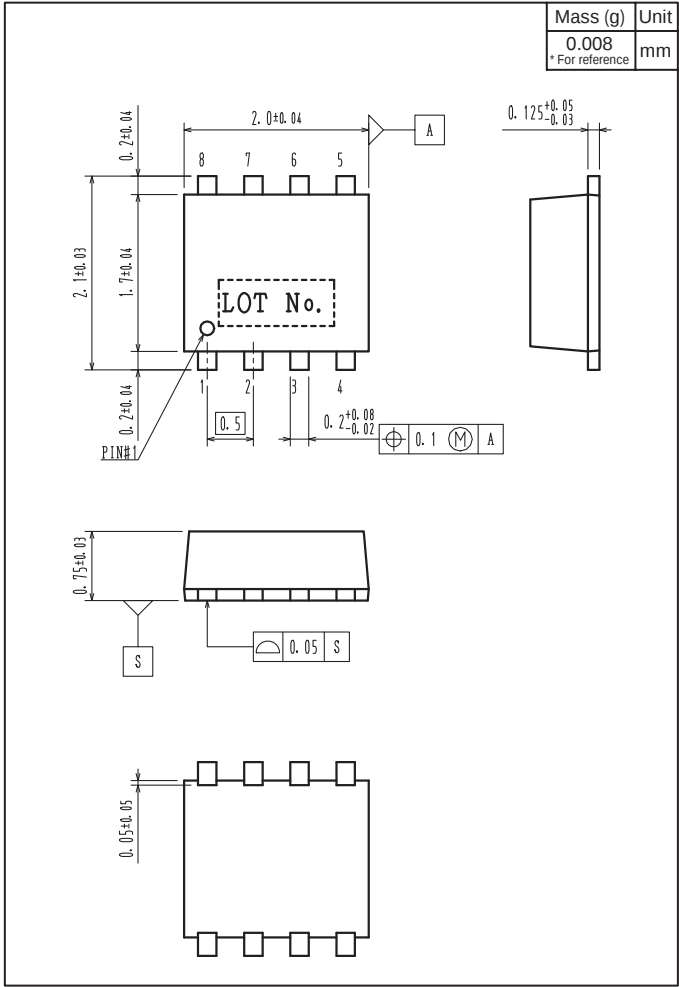
2-2. Device placement direction



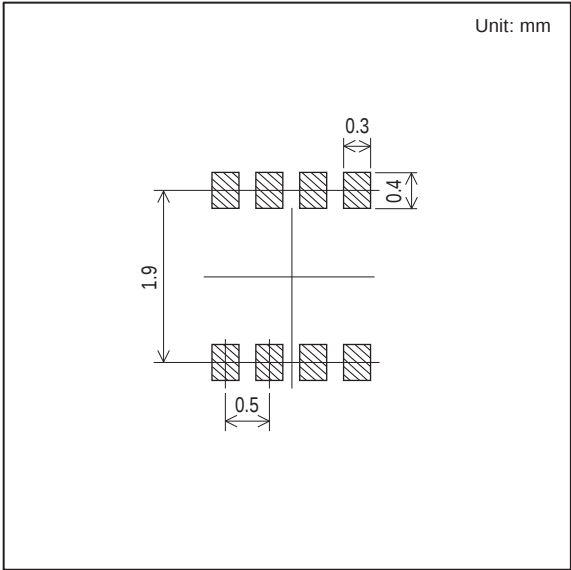
Those with pin 1 index on the feed hole side.....TL

EMH2604

Outline Drawing
EMH2604-TL-H



Land Pattern Example



Note on usage : Since the EMH2604 is a MOSFET product, please avoid using this device in the vicinity of highly charged objects.

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