



SANYO Semiconductors

DATA SHEET

An ON Semiconductor Company

N-Channel Silicon MOSFET

EMH1405 — General-Purpose Switching Device Applications

Features

- ON-resistance $R_{DS(on)} = 14\text{m}\Omega$ (typ)
- 4V drive
- Halogen free compliance
- Protection diode in

Specifications

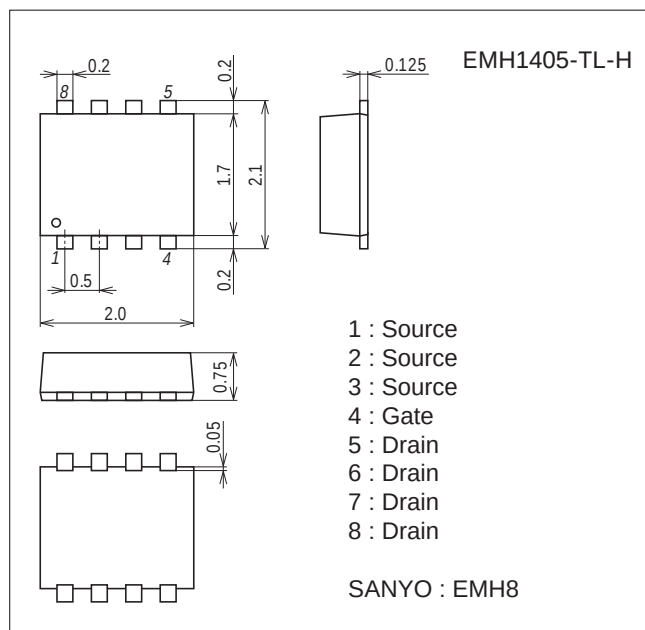
Absolute Maximum Ratings at $T_a = 25^\circ\text{C}$

Parameter	Symbol	Conditions	Ratings	Unit
Drain-to-Source Voltage	V_{DS}		30	V
Gate-to-Source Voltage	V_{GS}		± 20	V
Drain Current (DC)	I_D		8.5	A
Drain Current (Pulse)	I_{DP}	$PW \leq 10\mu\text{s}$, duty cycle $\leq 1\%$	34	A
Allowable Power Dissipation	P_D	When mounted on ceramic substrate ($1200\text{mm}^2 \times 0.8\text{mm}$)	1.5	W
Channel Temperature	T_{ch}		150	$^\circ\text{C}$
Storage Temperature	T_{stg}		-55 to +150	$^\circ\text{C}$

Package Dimensions

unit : mm (typ.)

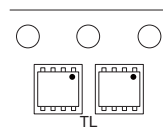
7045-001



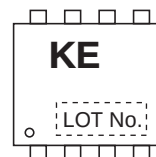
Product & Package Information

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

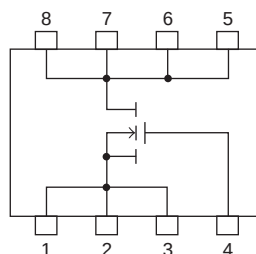
Taping Type : TL



Marking



Electrical Connection

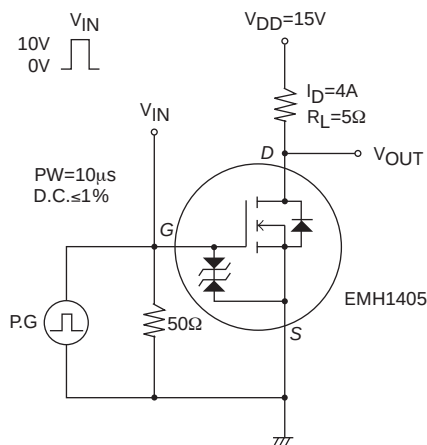


EMH1405

Electrical Characteristics at Ta=25°C

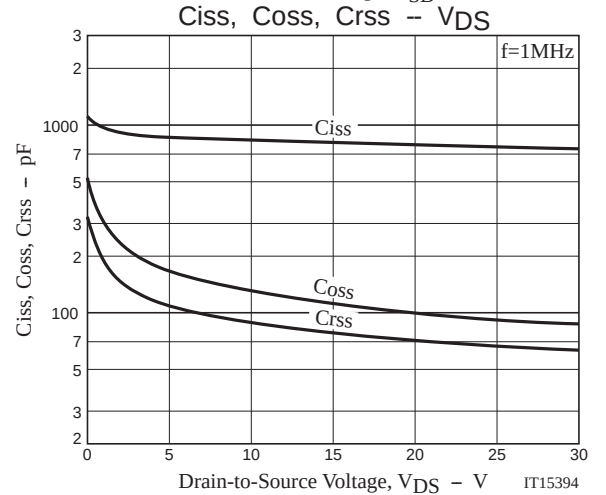
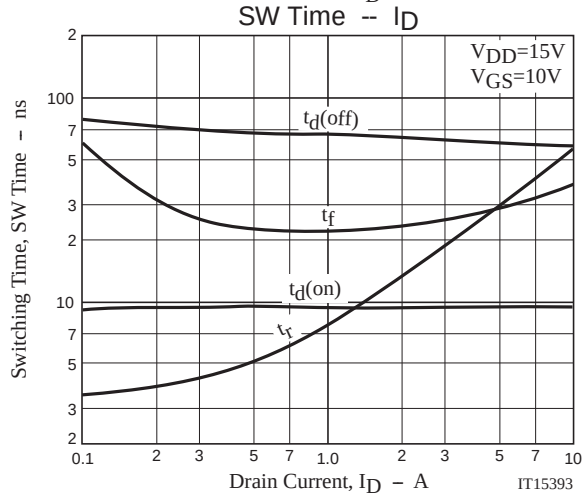
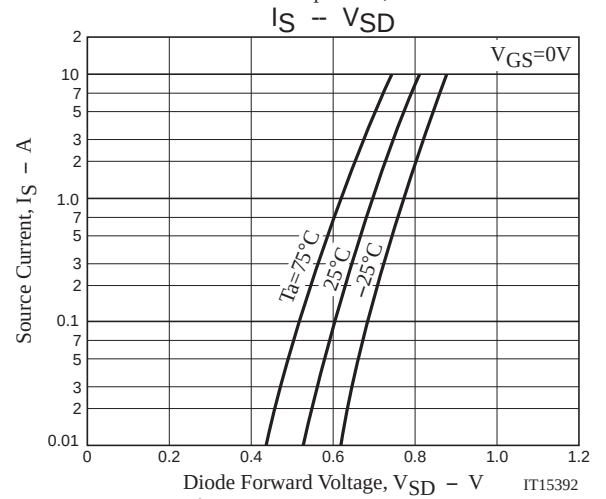
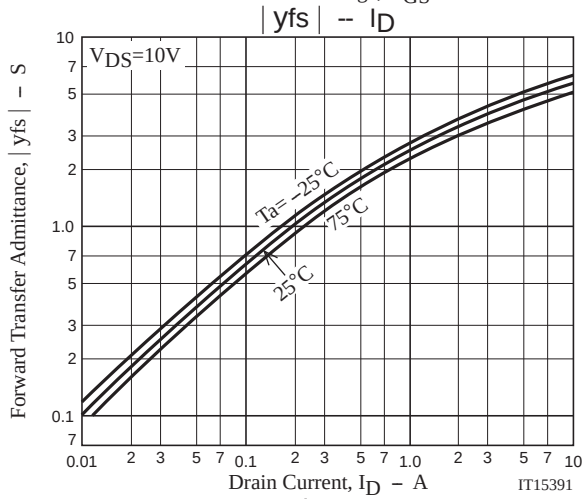
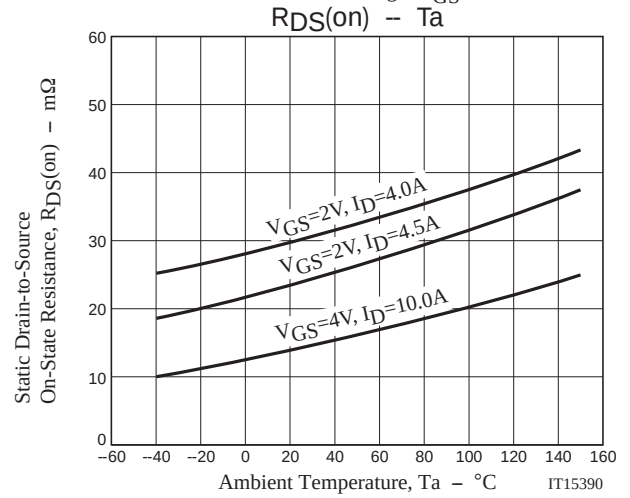
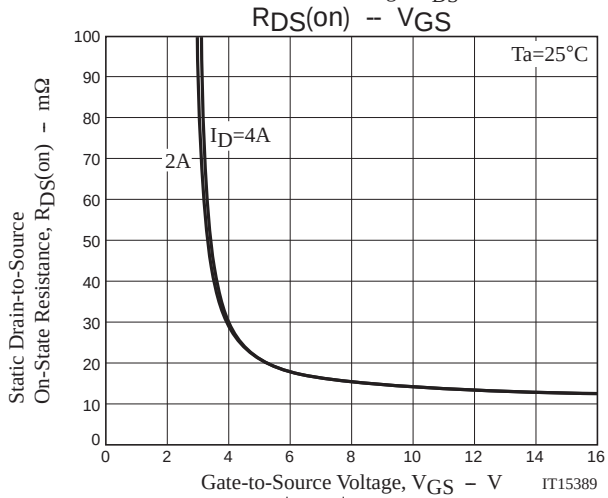
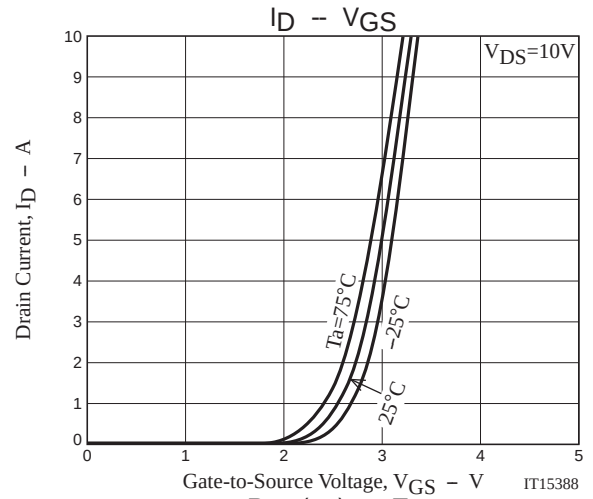
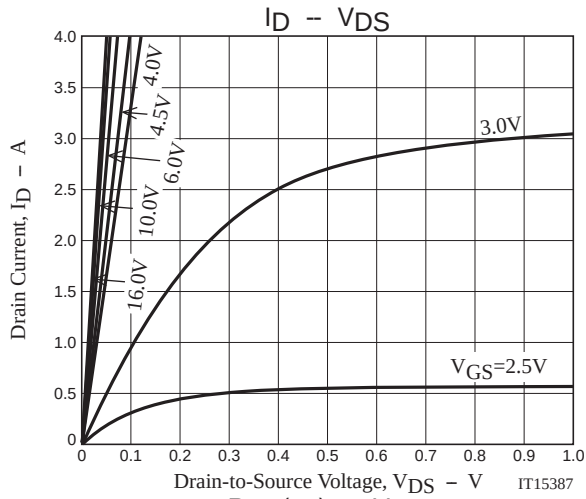
Parameter	Symbol	Conditions	Ratings			Unit
			min.	typ.	max.	
Drain-to-Source Breakdown Voltage	$V_{(BR)DSS}$	$I_D=1mA, V_{GS}=0V$	30			V
Zero-Gate Voltage Drain Current	I_{DSS}	$V_{DS}=30V, V_{GS}=0V$			1	μA
Gate-to-Source Leakage Current	I_{GSS}	$V_{GS}=\pm 16V, V_{DS}=0V$			± 10	μA
Cutoff Voltage	$V_{GS(off)}$	$V_{DS}=10V, I_D=1mA$	1.2		2.6	V
Forward Transfer Admittance	$ y_{fs} $	$V_{DS}=10V, I_D=4A$		4.4		S
Static Drain-to-Source On-State Resistance	$R_{DS(on)1}$	$I_D=4A, V_{GS}=10V$		14	19	$m\Omega$
	$R_{DS(on)2}$	$I_D=2A, V_{GS}=4.5V$		24	34	$m\Omega$
	$R_{DS(on)3}$	$I_D=2A, V_{GS}=4V$		30	42	$m\Omega$
Input Capacitance	C_{iss}	$V_{DS}=10V, f=1MHz$		820		pF
Output Capacitance	C_{oss}			130		pF
Reverse Transfer Capacitance	C_{rss}			90		pF
Turn-ON Delay Time	$t_d(on)$	See specified Test Circuit.		9.5		ns
Rise Time	t_r			25		ns
Turn-OFF Delay Time	$t_d(off)$			63		ns
Fall Time	t_f			28		ns
Total Gate Charge	Q_g	$V_{DS}=15V, V_{GS}=10V, I_D=8.5A$		15		nC
Gate-to-Source Charge	Q_{gs}			2.6		nC
Gate-to-Drain "Miller" Charge	Q_{gd}			2.7		nC
Diode Forward Voltage	V_{SD}	$I_S=8.5A, V_{GS}=0V$		0.8	1.2	V

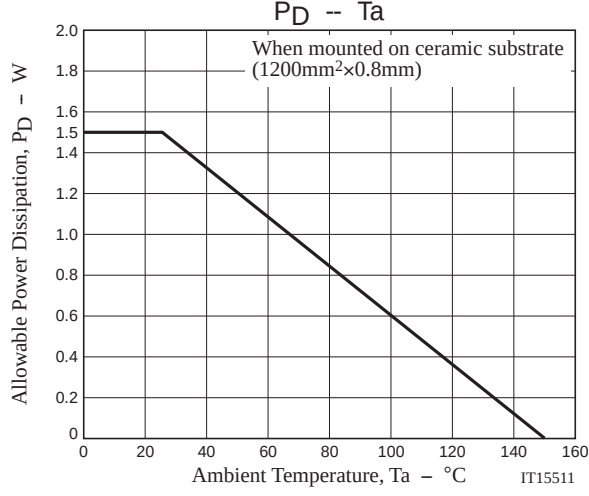
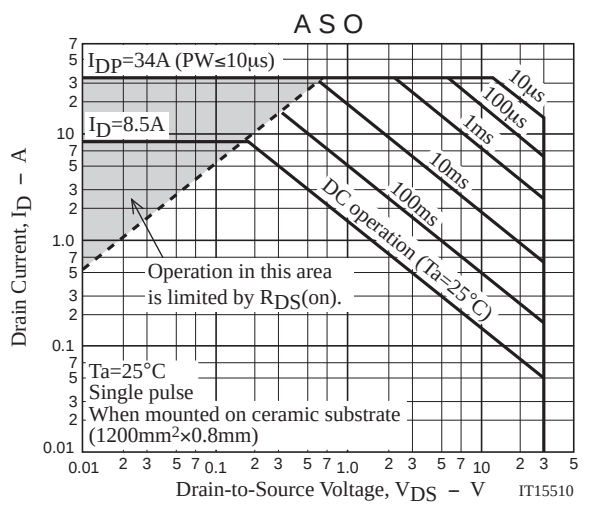
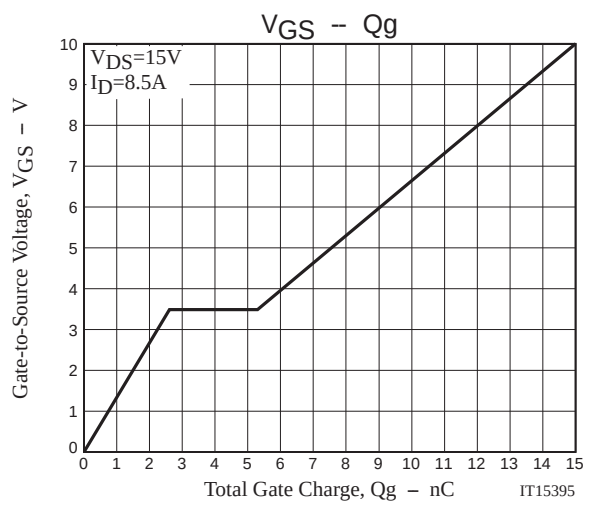
Switching Time Test Circuit



Ordering Information

Device	Package	Shipping	memo
EMH1405-TL-H	EMH8	3,000pcs./reel	Pb Free and Halogen Free





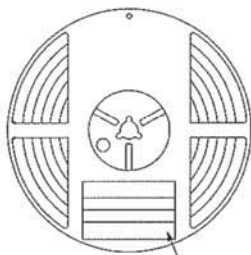
Embossed Taping Specification

EMH1405-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)

69	43	80
(1) TYPE 0000000000		
(17) LOT 00		
(10) QTY 0,000 (1) LEAD FREE *		
(2) SPECIAL		
20722005310C		
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.

108	80
TYPE CODE	
TYPE	0000000000
QTY	0,000 PCS (1) LEAD FREE *
LOT	0000000000
PACKAGE	0000000000
SPECIAL	
20722005310C	
ASSEMBLY:**** (DIFFUSION:****)	

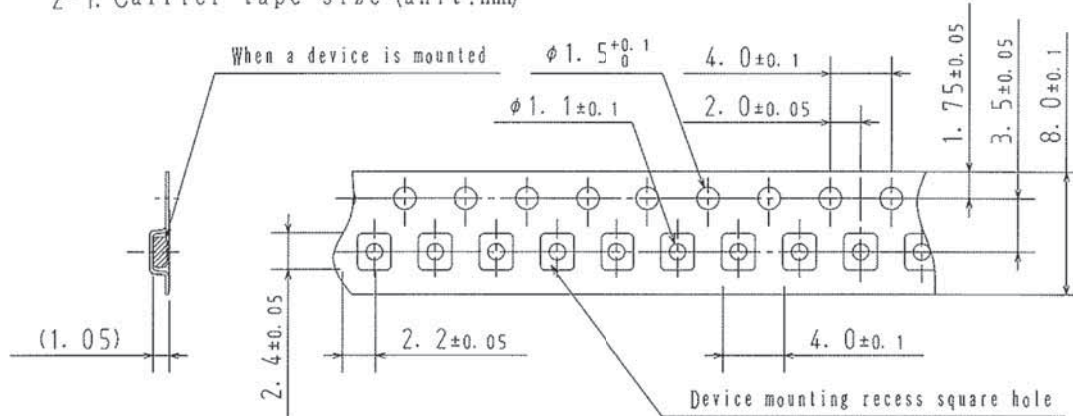
NOTE (1)

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

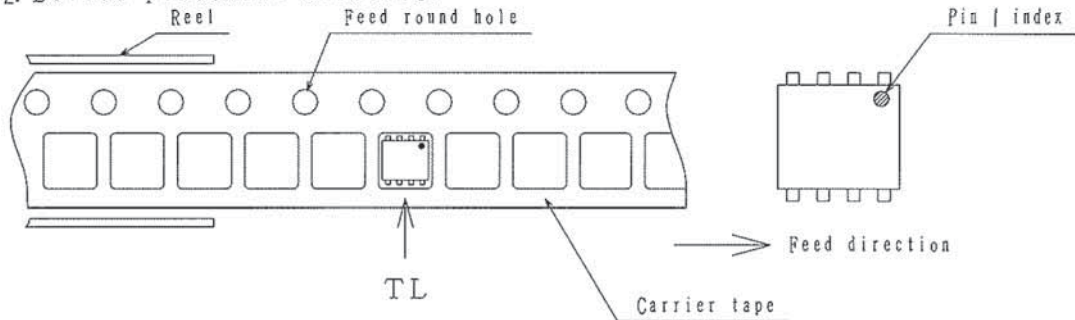
Label	JEITA Phase
LEAD FREE 3	JEITA Phase 3A
LEAD FREE 4	JEITA Phase 3

2. Taping configuration

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



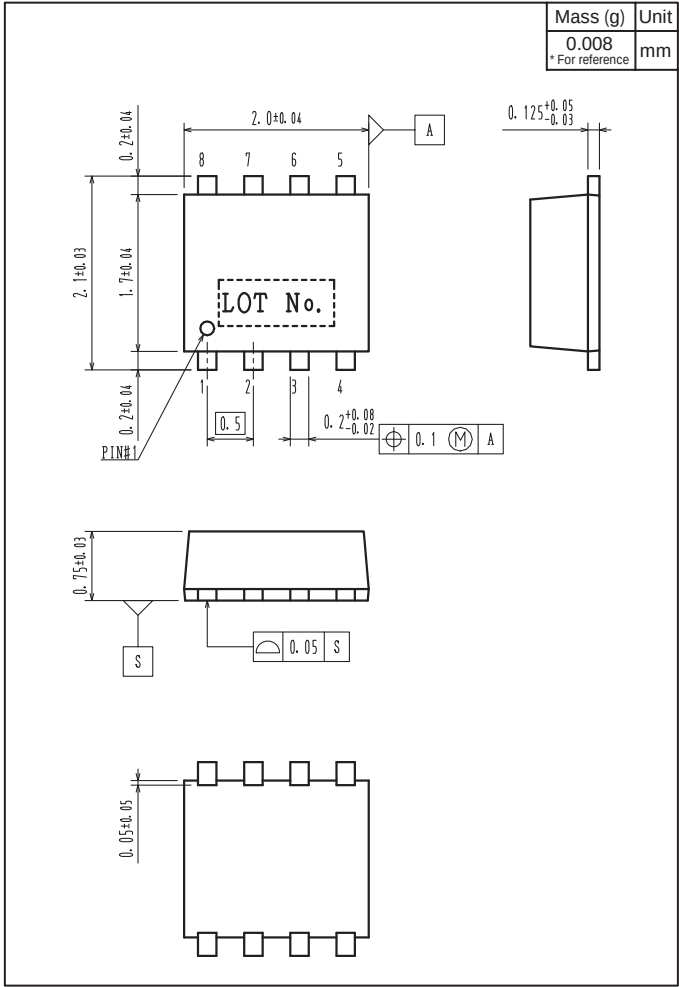
2-2. Device placement direction



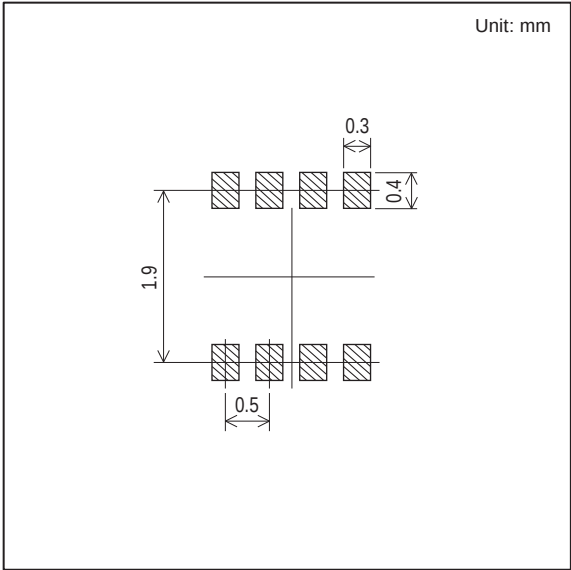
Those with pin 1 index on the feed hole side.....TL

EMH1405

Outline Drawing
EMH1405-TL-H



Land Pattern Example



Note on usage : Since the EMH1405 is a MOSFET product, please avoid using this device in the vicinity of highly charged objects.

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