



SANYO Semiconductors

DATA SHEET

An ON Semiconductor Company

MCH5839

MOSFET : P-Channel Silicon MOSFET
SBD : Schottky Barrier Diode

General-Purpose Switching Device Applications

Features

- Composite type with an P-channel silicon MOSFET and a schottky barrier diode contained in one package facilitating high-density mounting
- Halogen free compliance
- [MOSFET]
 - Low On-resistance $R_{DS(on)1}=205m\Omega$ (typ.)
 - Protection diode in
- [SBD]
 - Short reverse recovery time

- 1.8V drive

- Low forward voltage

Specifications

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

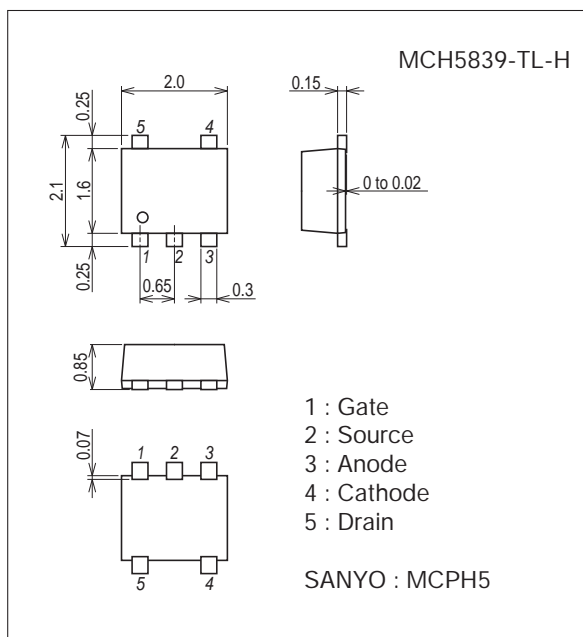
Parameter	Symbol	Conditions	Ratings	Unit
[MOSFET]				
Drain-to-Source Voltage	V_{DSS}		-20	V
Gate-to-Source Voltage	V_{GSS}		± 10	V
Drain Current (DC)	I_D		-1.5	A
Drain Current (Pulse)	I_{DP}	$PW \leq 10\mu s$, duty cycle $\leq 1\%$	-6	A
Allowable Power Dissipation	PD	When mounted on ceramic substrate (1000mm ² ×0.8mm) 1unit	0.8	W
Channel Temperature	T_{ch}		150	°C
Storage Temperature	T_{stg}		-55 to +125	°C

Continued on next page.

Package Dimensions

unit : mm (typ)

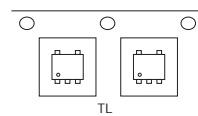
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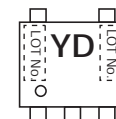
Product & Package Information

- Package : MCPH5
- JEITA, JEDEC : SC-88A, SOT-353
- Minimum Packing Quantity : 3,000 pcs./reel

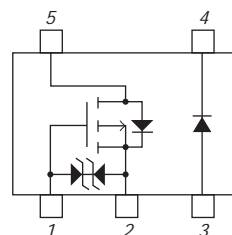
Packing Type : TL



Marking



Electrical Connection



MCH5839

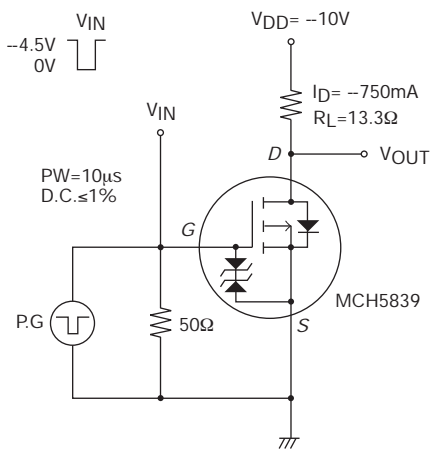
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Parameter	Symbol	Conditions	Ratings	Unit
[SBD]				
Repetitive Peak Reverse Voltage	V_{RRM}		15	V
Nonrepetitive Peak Reverse Surge Voltage	V_{RSM}		15	V
Average Output Current	I_O		1	A
Surge Forward Current	I_{FSM}	50Hz sine wave, 1 cycle	3	A
Junction Temperature	T_J		-55 to +125	°C
Storage Temperature	T_{stg}		-55 to +125	°C

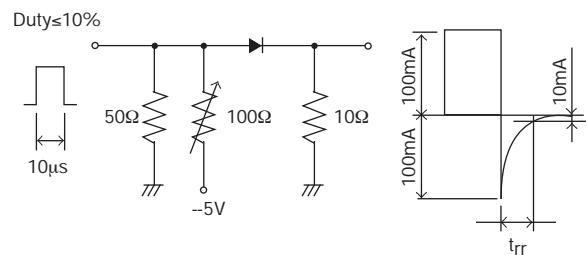
Electrical Characteristics at $T_a=25^\circ\text{C}$

Parameter	Symbol	Conditions	Ratings			Unit
			min	typ	max	
[MOSFET]						
Drain-to-Source Breakdown Voltage	$V_{(BR)DSS}$	$I_D=-1\text{mA}, V_{GS}=0\text{V}$	-20			V
Zero-Gate Voltage Drain Current	I_{DSS}	$V_{DS}=-20\text{V}, V_{GS}=0\text{V}$			-1	μA
Gate-to-Source Leakage Current	I_{GSS}	$V_{GS}=\pm 8\text{V}, V_{DS}=0\text{V}$			± 10	μA
Cutoff Voltage	$V_{GS(off)}$	$V_{DS}=-10\text{V}, I_D=-1\text{mA}$	-0.4		-1.4	V
Forward Transfer Admittance	$ y_{fs} $	$V_{DS}=-10\text{V}, I_D=-750\text{mA}$		1.9		S
Static Drain-to-Source On-State Resistance	$R_{DS(on)1}$	$I_D=-750\text{mA}, V_{GS}=-4.5\text{V}$		205	266	$\text{m}\Omega$
	$R_{DS(on)2}$	$I_D=-300\text{mA}, V_{GS}=-2.5\text{V}$		295	413	$\text{m}\Omega$
	$R_{DS(on)3}$	$I_D=-100\text{mA}, V_{GS}=-1.8\text{V}$		430	645	$\text{m}\Omega$
Input Capacitance	C_{iss}	$V_{DS}=-10\text{V}, f=1\text{MHz}$		120		pF
Output Capacitance	C_{oss}		26		pF	
Reverse Transfer Capacitance	C_{rss}		20		pF	
Turn-ON Delay Time	$t_{d(on)}$		5.3		ns	
Rise Time	t_r	See specified Test Circuit.		9.7		ns
Turn-OFF Delay Time	$t_{d(off)}$		16		ns	
Fall Time	t_f		14		ns	
Total Gate Charge	Q_g		1.7		nC	
Gate-to-Source Charge	Q_{gs}	$V_{DS}=-10\text{V}, V_{GS}=-4.5\text{V}, I_D=-1.5\text{A}$		0.28		nC
Gate-to-Drain "Miller" Charge	Q_{gd}		0.47		nC	
Diode Forward Voltage	V_{SD}		$I_S=-1.5\text{A}, V_{GS}=0\text{V}$	-0.89	-1.2	V
[SBD]						
Reverse Voltage	V_R	$I_R=0.5\text{mA}$	15			V
Forward Voltage	V_F	$I_F=0.5\text{A}$		0.4	0.46	V
Reverse Current	I_R	$V_R=6\text{V}$			90	μA
Interterminal Capacitance	C	$V_R=10\text{V}, f=1\text{MHz}$		13		pF
Reverse Recovery Time	t_{rr}	$I_F=I_R=100\text{mA}$, See specified Test Circuit.			10	ns

Switching Time Test Circuit (MOSFET)

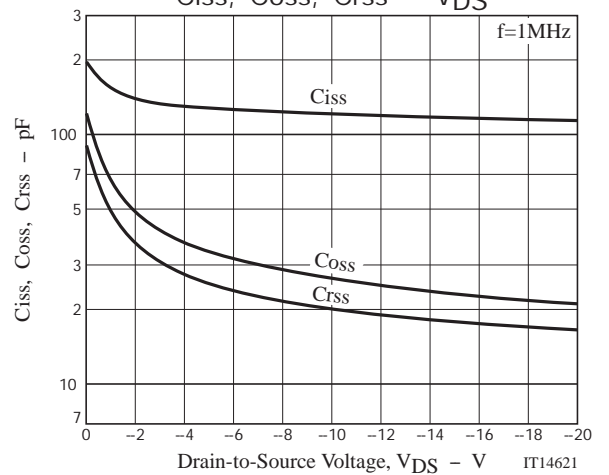
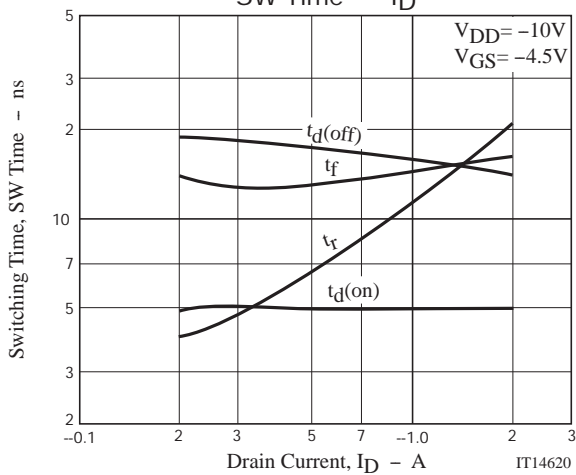
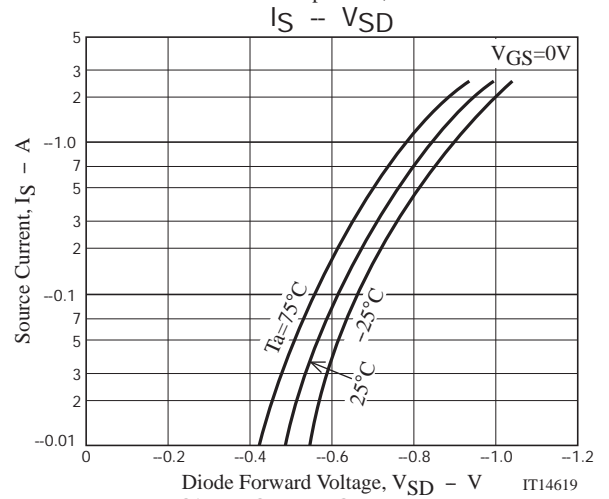
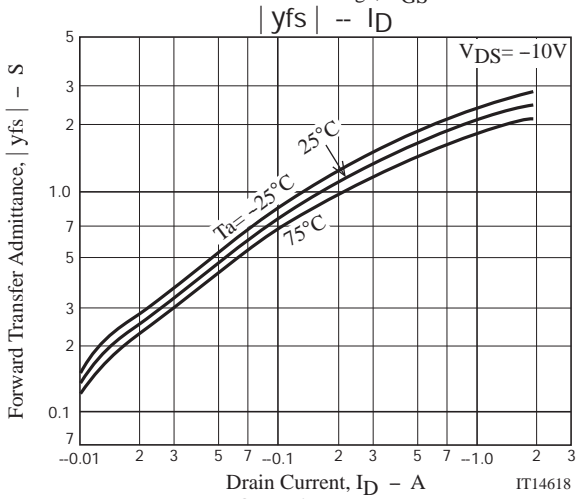
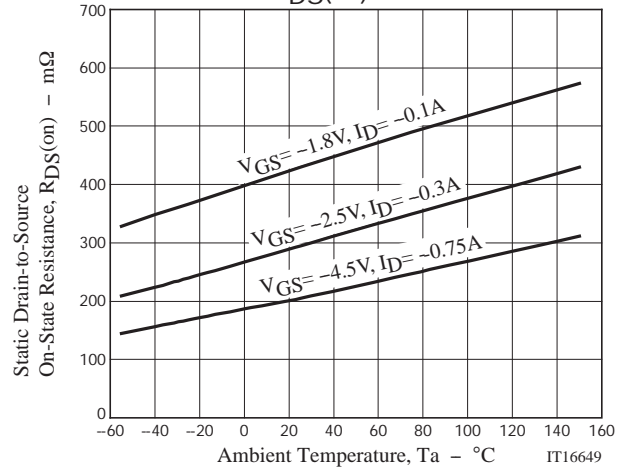
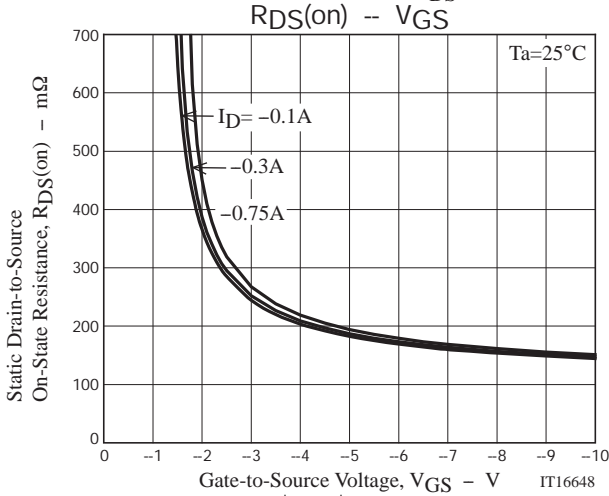
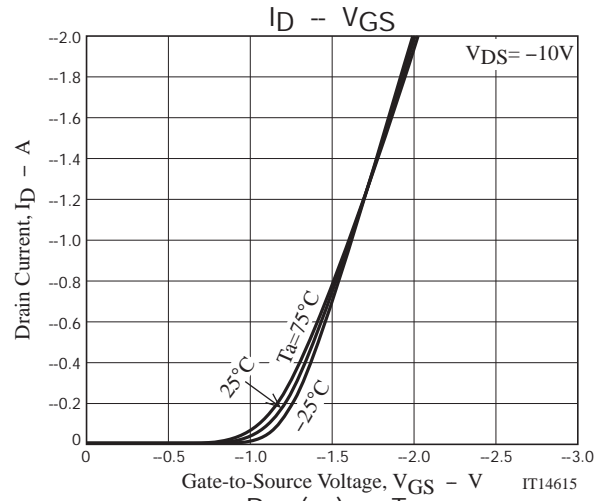
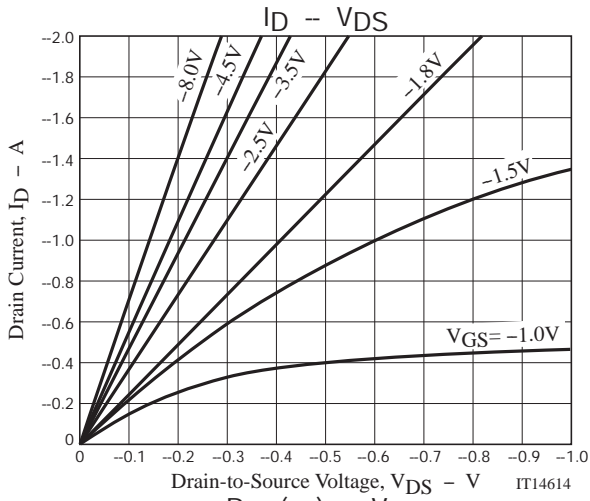


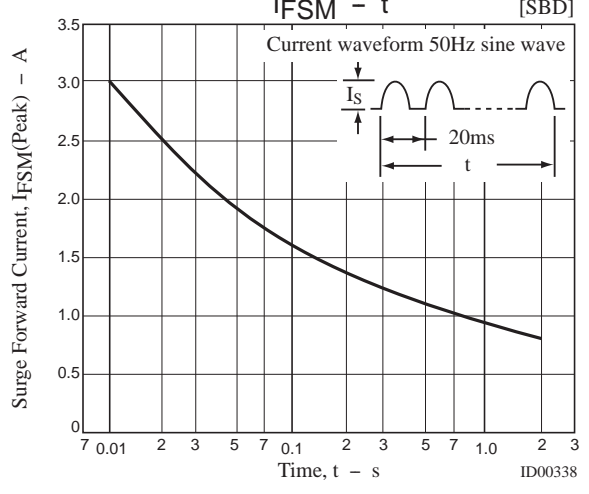
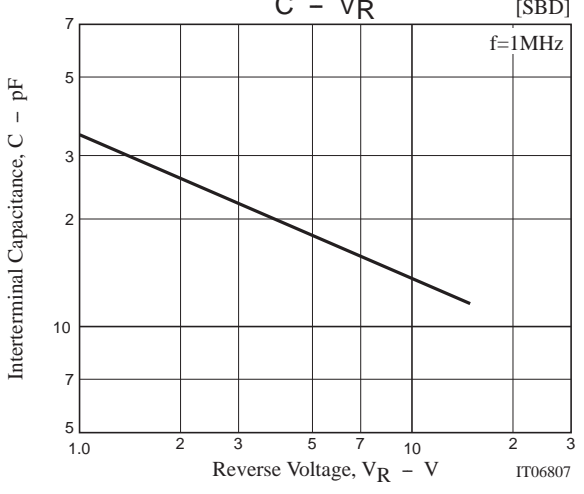
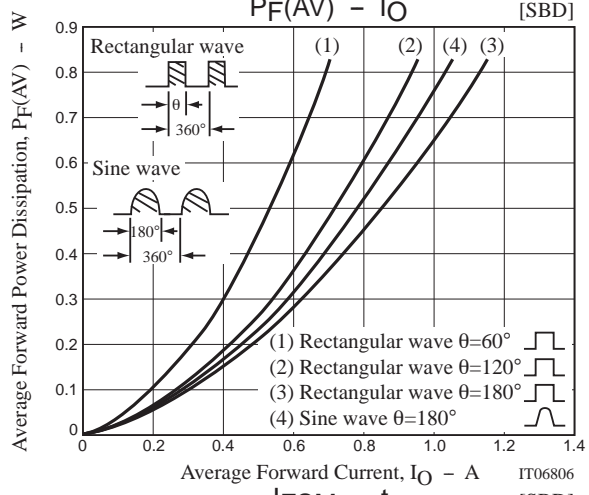
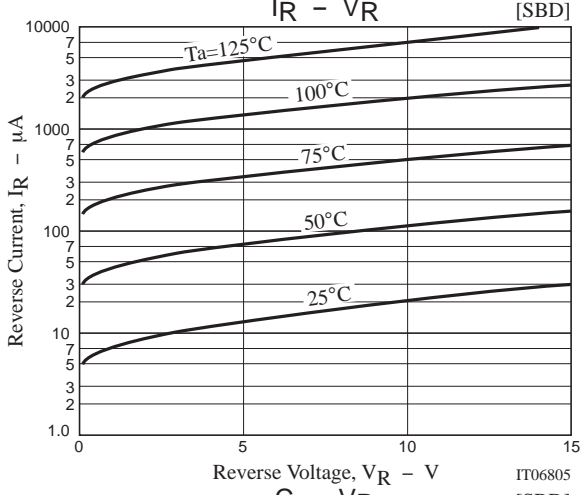
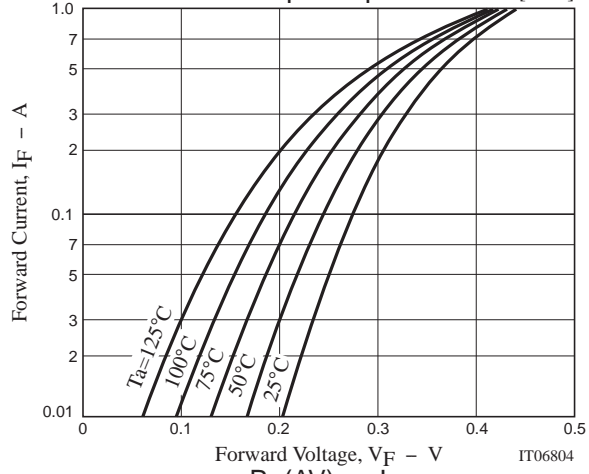
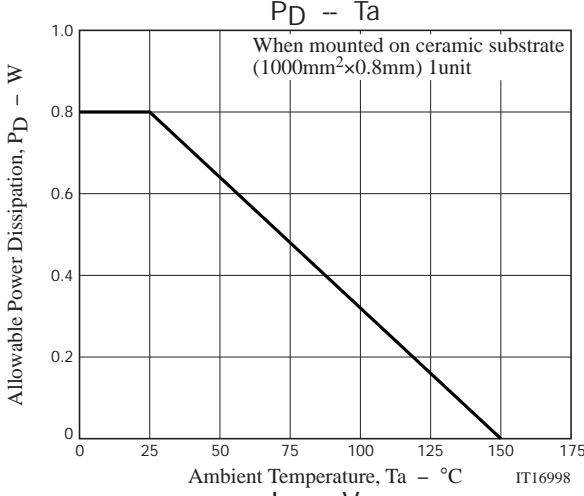
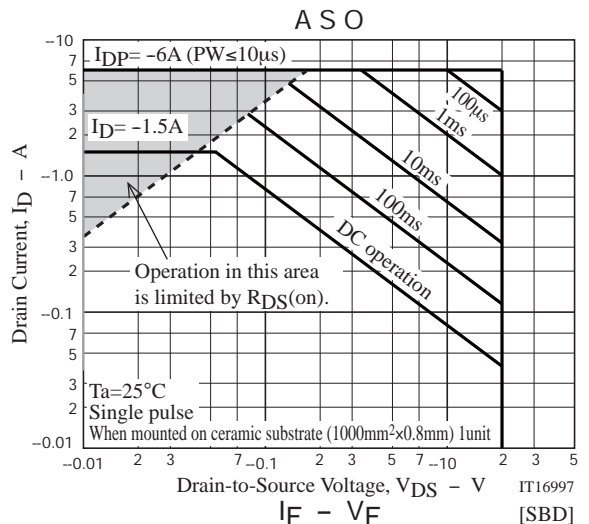
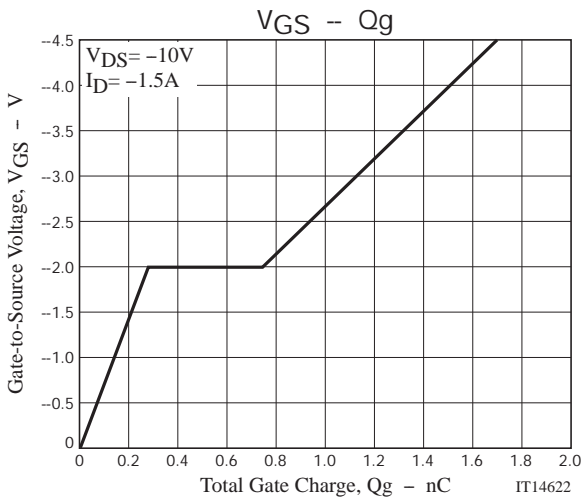
t_{rr} Test Circuit (SBD)



Ordering Information

Device	Package	Shipping	memo
MCH5839-TL-H	MCPH5	3,000pcs./reel	Pb Free and Halogen Free





Taping Specification

MCH5839-TL-H

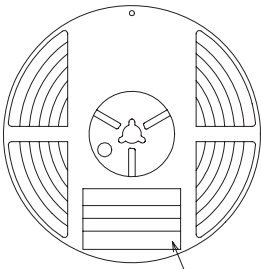
1. Packing Format

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)
MCPH5	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

Reel label, Inner box label
(unit : mm)

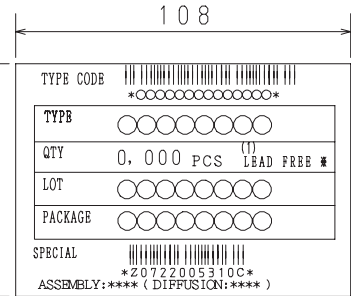
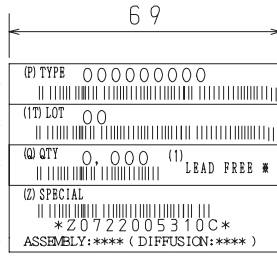
Outer box label
It is a label at the time of factory shipments.
The form of a label may change in physical distribution process.

Packing method



Reel label

Type No.
LOT No.
Quantity
Origin



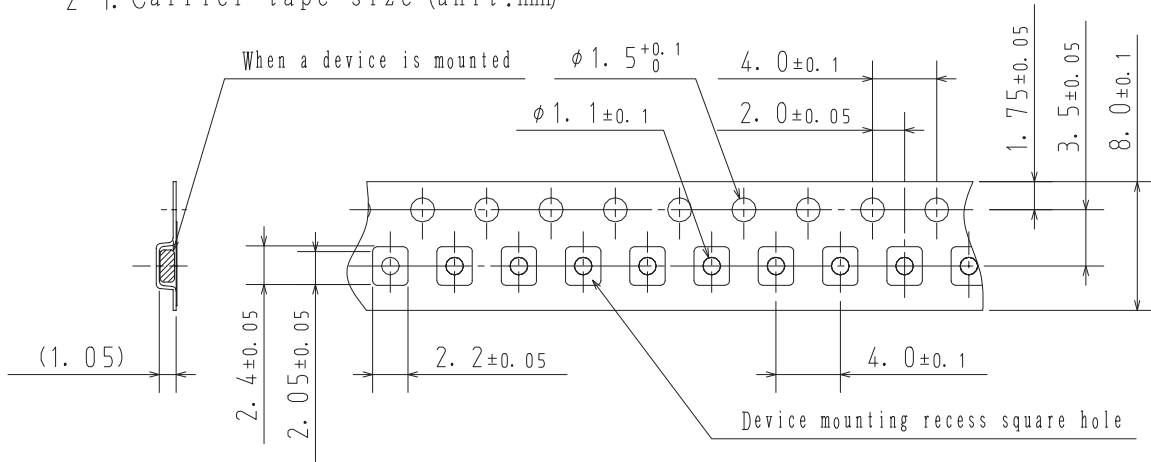
NOTE (1)

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

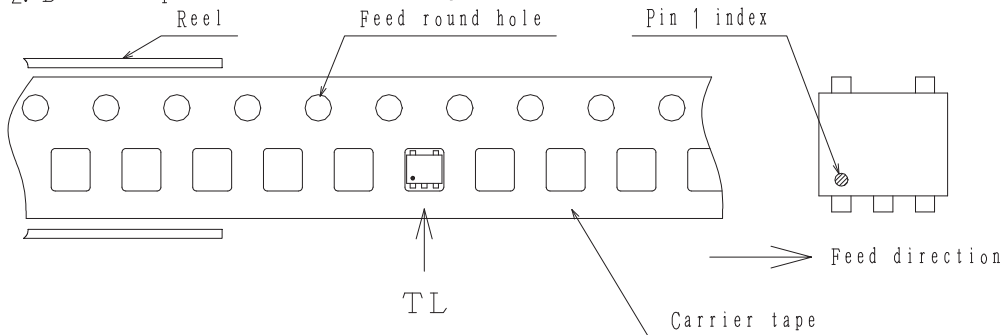
Label	JEITA Phase
LEAD FREE 3	JEITA Phase 3A
LEAD FREE 4	JEITA Phase 3

2. Taping configuration

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



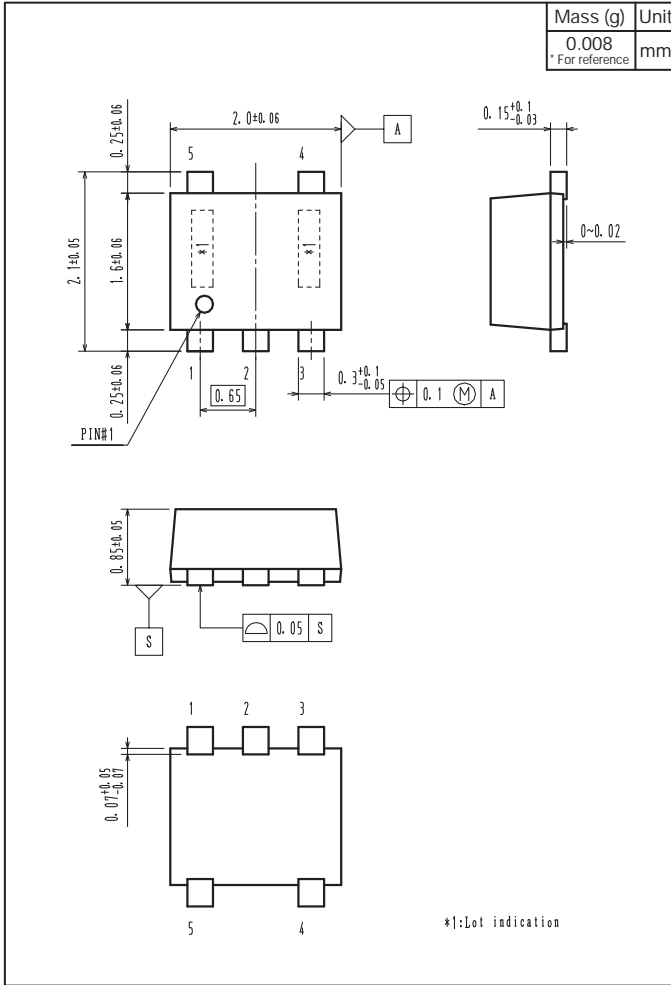
2-2. Device placement direction



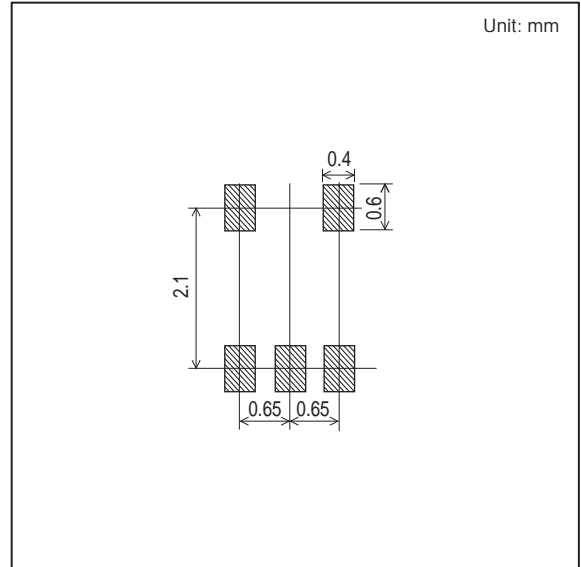
Those with two electrode terminal on the feed hole side.....TL

MCH5839

Outline Drawing MCH5839-TL-H



Land Pattern Example



Note on usage : Since the MCH5839 is a MOSFET product, please avoid using this device in the vicinity of highly charged objects.

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