



MCH5839

P-Channel Power MOSFET -20V, -1.5A, 266mΩ, Single MCPH5 with Schottky Diode

ON Semiconductor®

<http://onsemi.com>

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

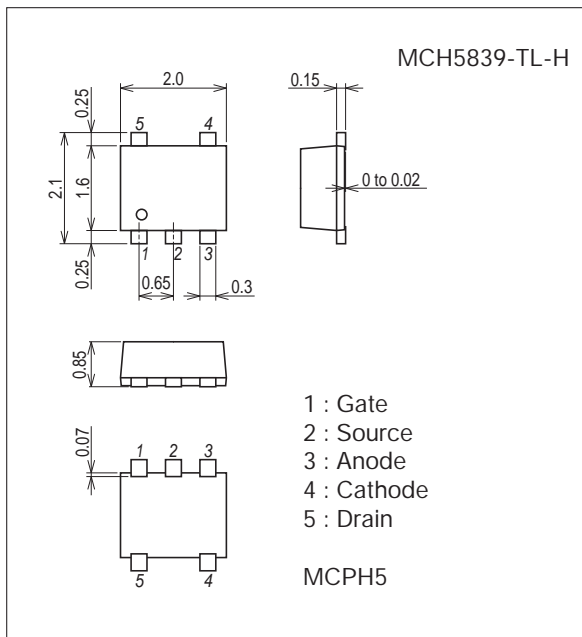
Absolute Maximum Ratings at $T_a=25^\circ C$

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	P_D	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

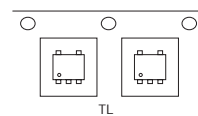
unit : mm (typ)
7021A-008



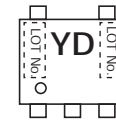
Product & Package Information

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

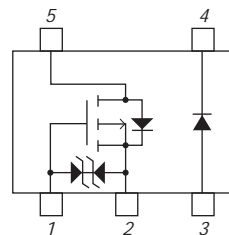
Packing Type : TL



Marking



Electrical Connection



MCH5839

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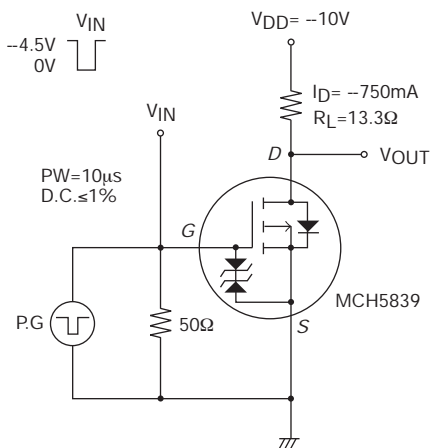
Parameter	Symbol	Conditions	Ratings	Unit
[SBD]				
Repetitive Peak Reverse Voltage	V_{RRM}		15	V
Nonrepetitive Peak Reverse Surge Voltage	V_{RSM}		15	V
Average Output Current	I_O		1	A
Surge Forward Current	I_{FSM}	50Hz sine wave, 1 cycle	3	A
Junction Temperature	T_j		-55 to +125	°C
Storage Temperature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

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.

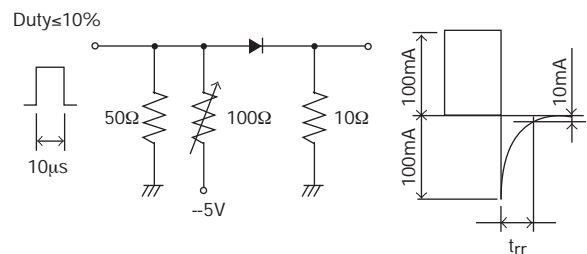
Electrical Characteristics at $T_a=25^\circ\text{C}$

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		9.7		ns	
Turn-OFF Delay Time	$t_d(off)$		16		ns	
Fall Time	t_f		14		ns	
Total Gate Charge	Q_g	$V_{DS}=-10\text{V}, V_{GS}=-4.5\text{V}, I_D=-1.5\text{A}$		1.7		nC
Gate-to-Source Charge	Q_{gs}		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)

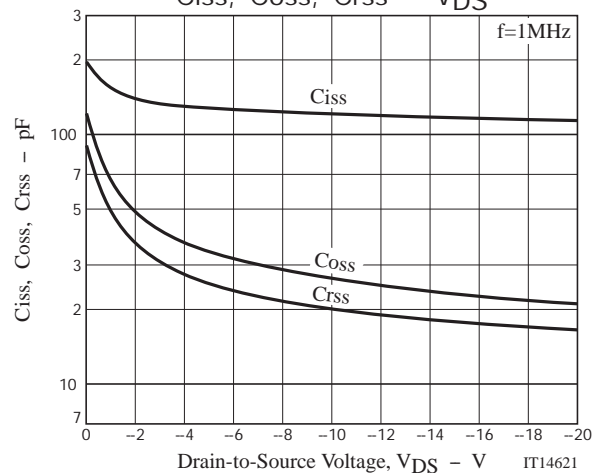
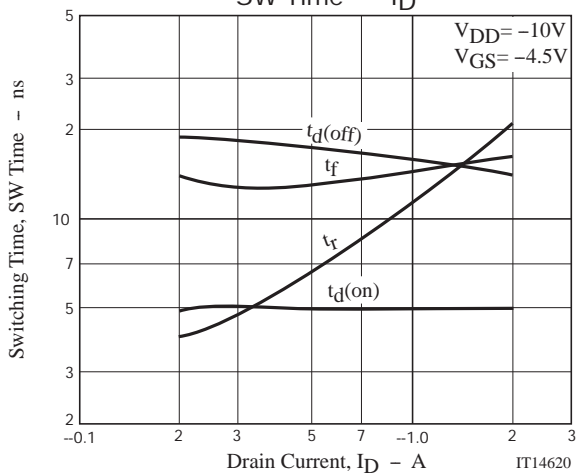
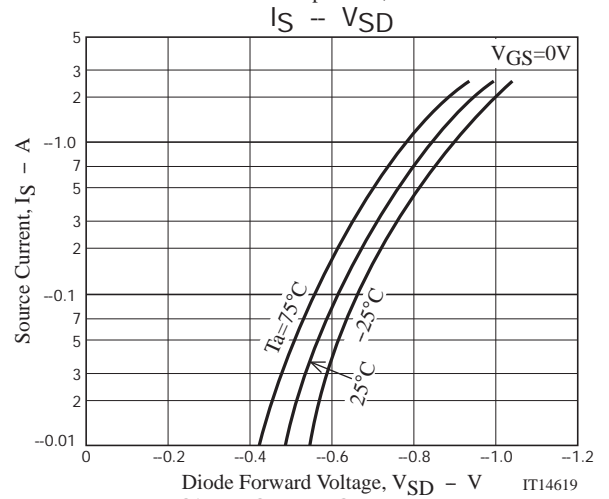
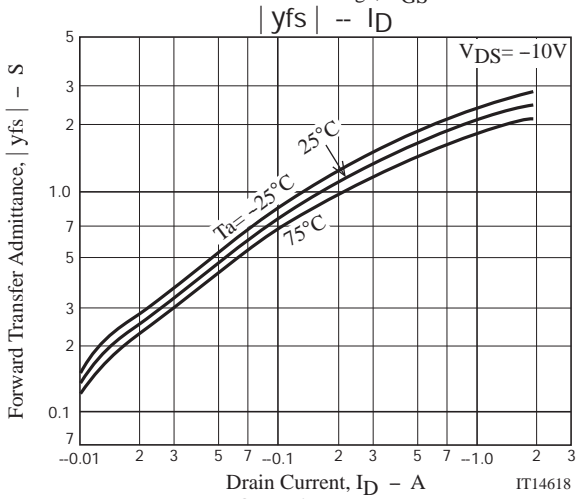
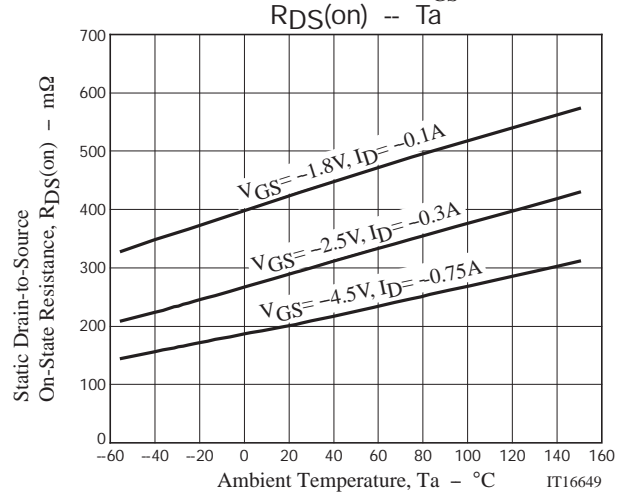
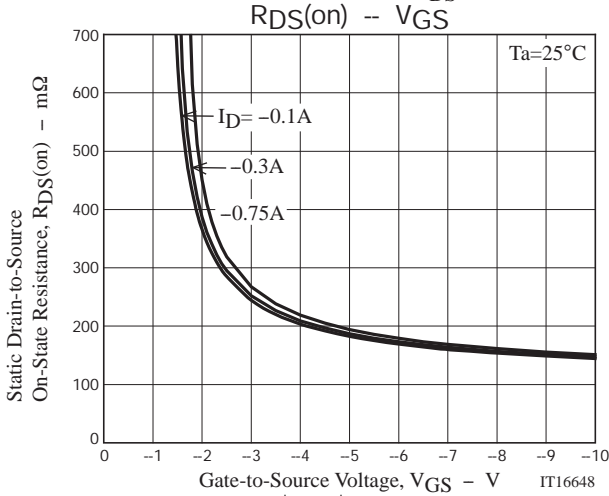
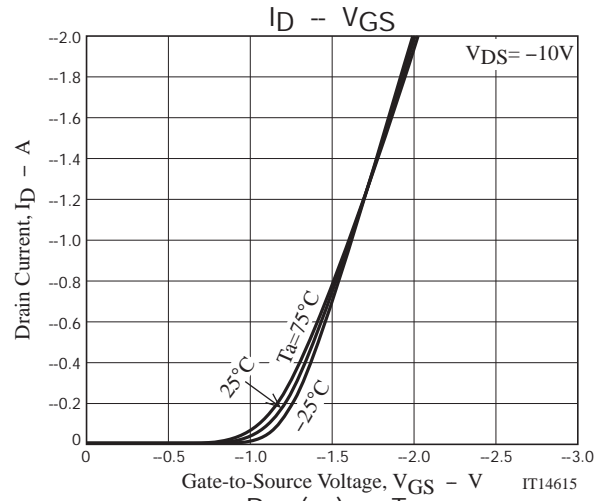
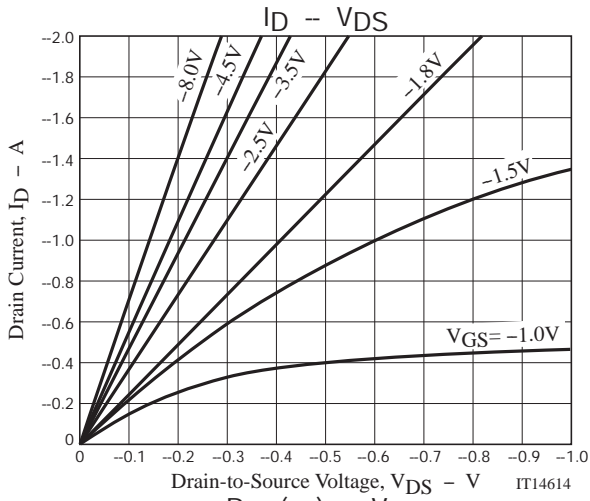


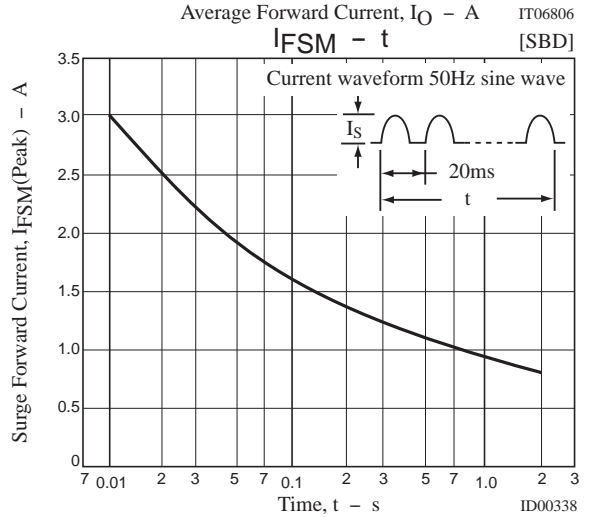
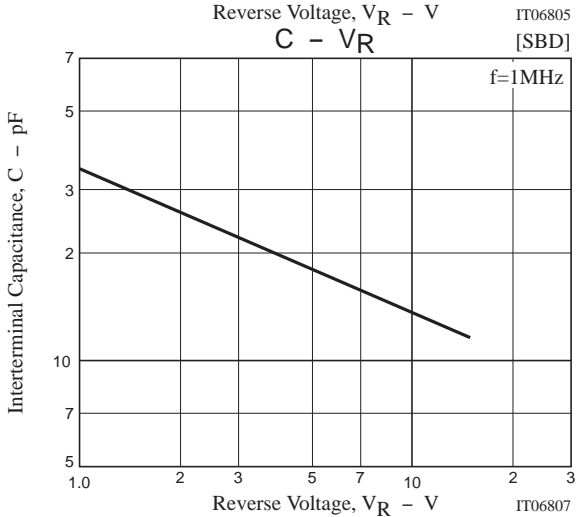
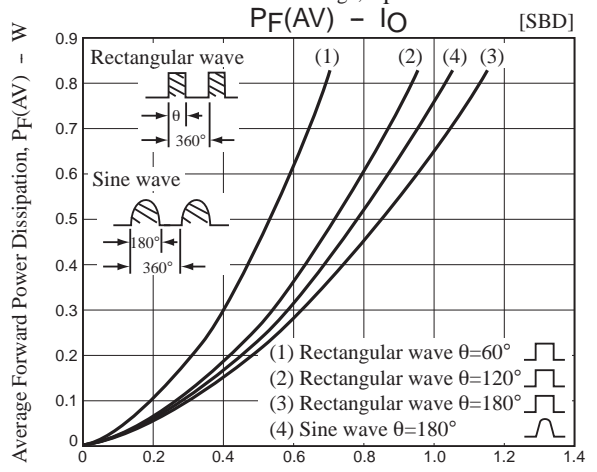
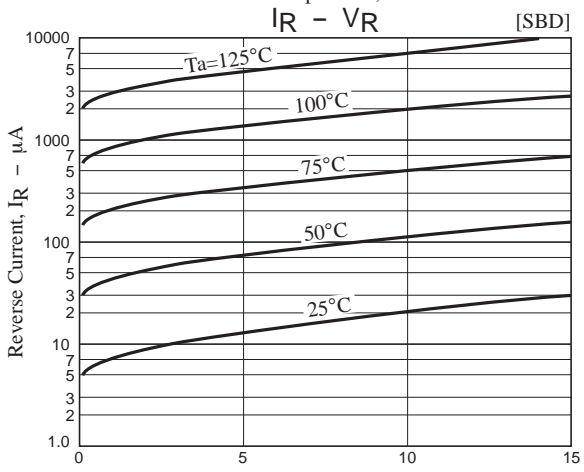
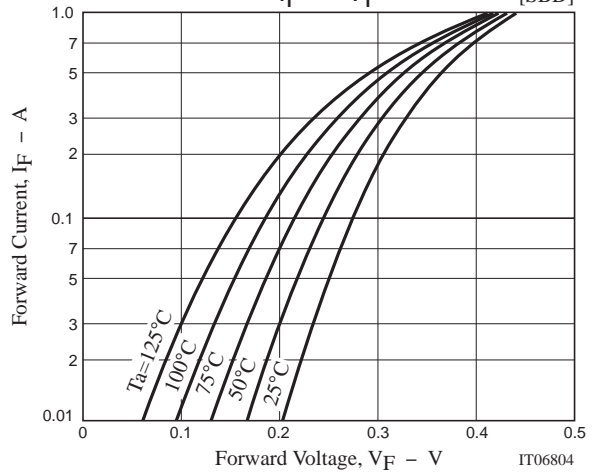
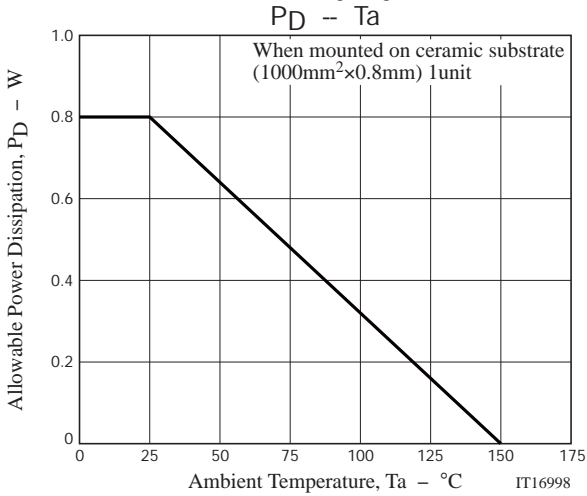
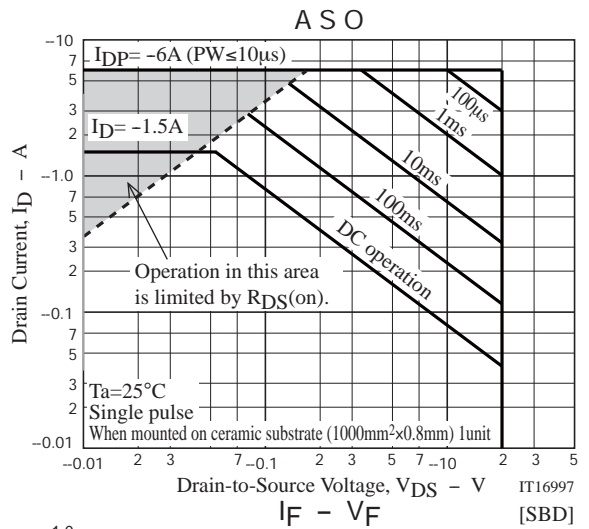
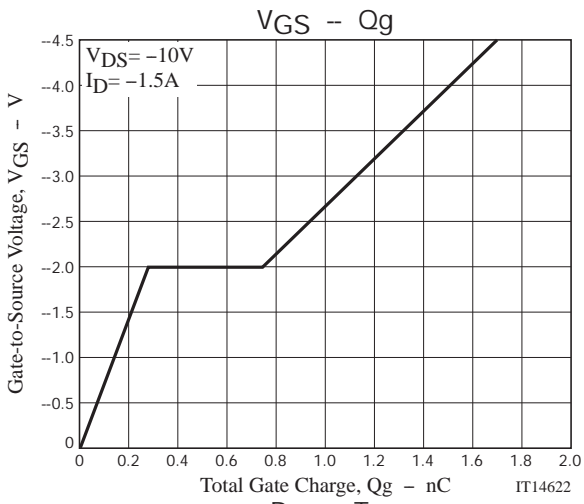
t_{rr} Test Circuit (SBD)



Ordering Information

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





Taping Specification

MCH5839-TL-H

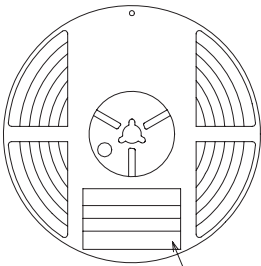
1. Packing Format

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)

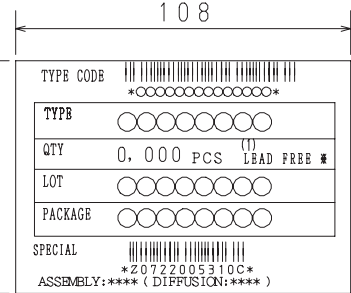
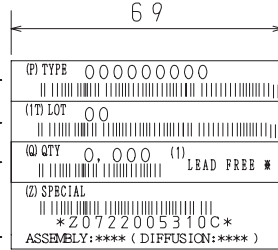
Outer box label
It is a label at the time of factory shipments.
The form of a label may change in physical distribution process.

Packing method



Reel label

Type No.
LOT No.
Quantity
Origin



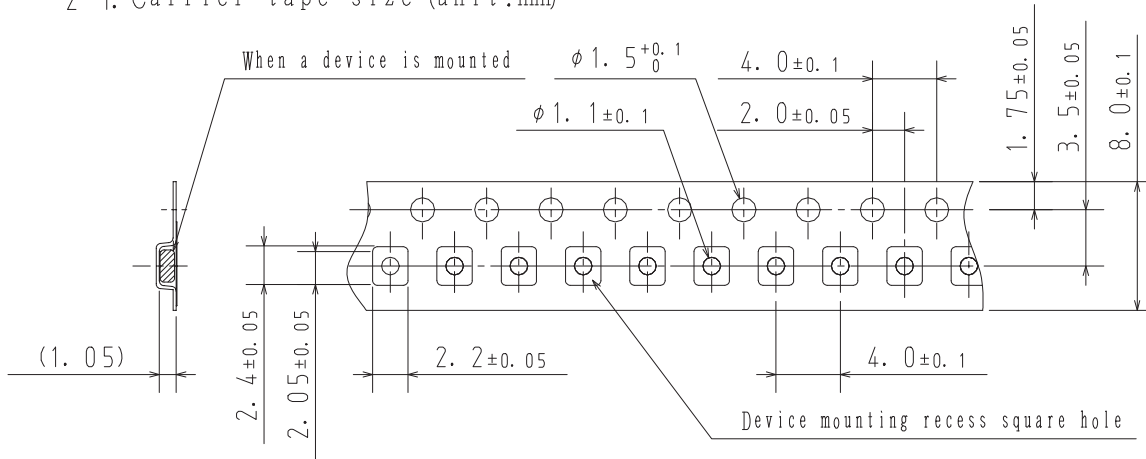
NOTE (1)

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

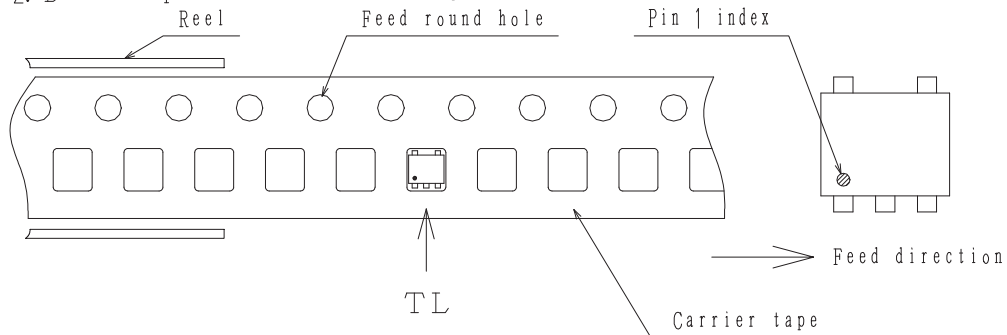
Label	JEITA Phase
LEAD FREE 3	JEITA Phase 3A
LEAD FREE 4	JEITA Phase 3

2. Taping configuration

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



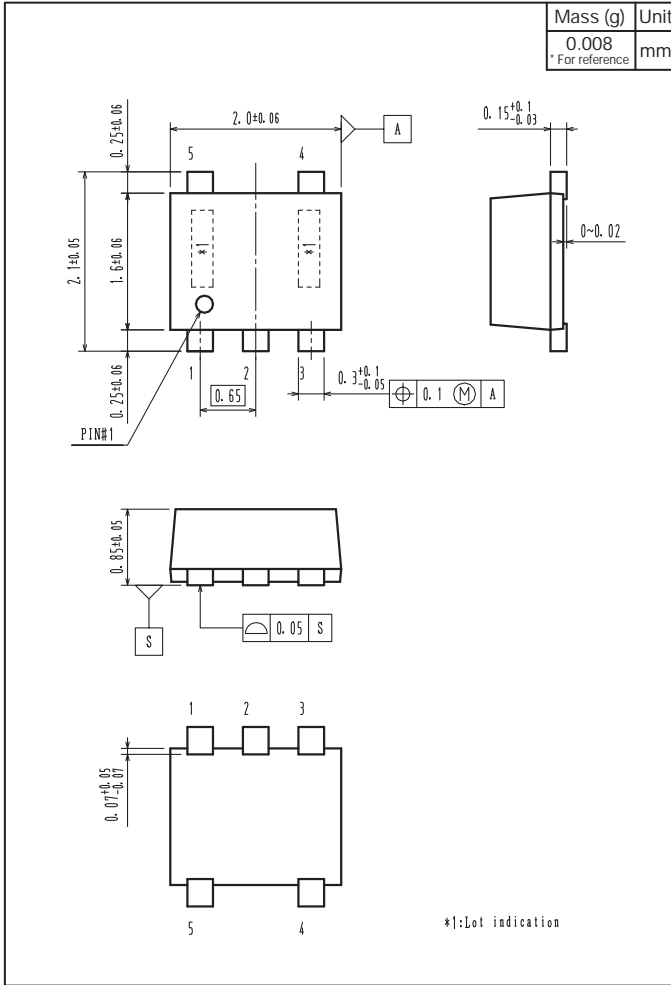
2-2. Device placement direction



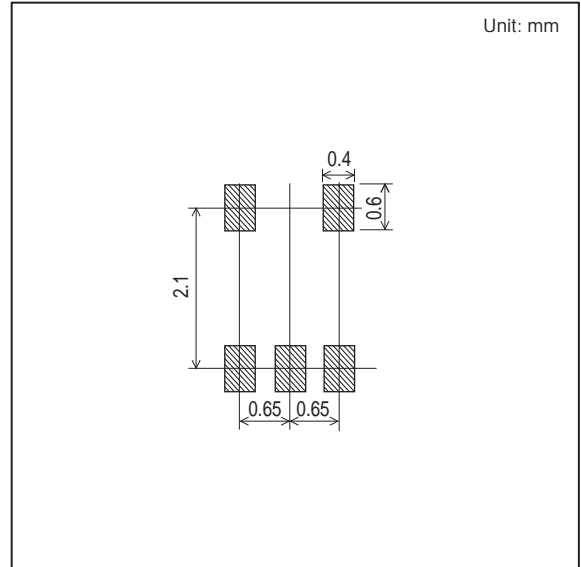
Those with two electrode terminal on the feed hole side.....TL

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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