



SANYO Semiconductors

# DATA SHEET

An ON Semiconductor Company

N-Channel and P-Channel Silicon MOSFET

## MCH6660 — General-Purpose Switching Device Applications

### Features

- ON-resistance Nch :  $R_{DS(on)1}=105m\Omega(\text{typ.})$   
Pch :  $R_{DS(on)1}=205m\Omega(\text{typ.})$
- 1.8V drive
- Halogen free compliance
- Protection diode in

### Specifications

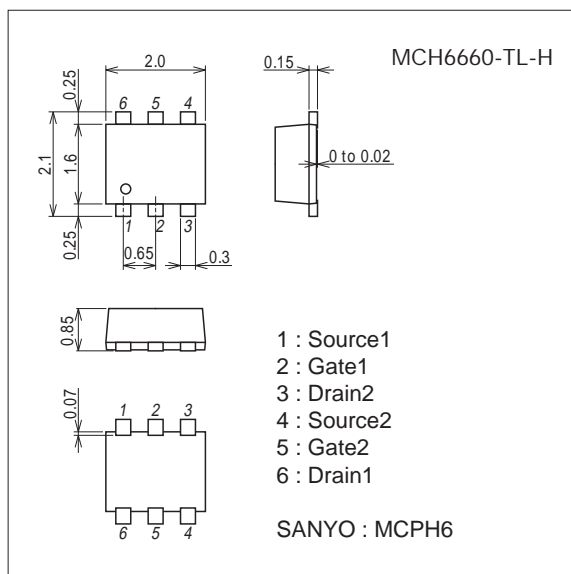
Absolute Maximum Ratings at  $T_a=25^\circ\text{C}$

Parameter	Symbol	Conditions	N-channel	P-channel	Unit
Drain-to-Source Voltage	$V_{DSS}$		20	-20	V
Gate-to-Source Voltage	$V_{GSS}$		$\pm 10$	$\pm 10$	V
Drain Current (DC)	$I_D$		2	-1.5	A
Drain Current (Pulse)	$I_{DP}$	$PW \leq 10\mu\text{s}$ , duty cycle $\leq 1\%$	8	-6	A
Allowable Power Dissipation	$P_D$	When mounted on ceramic substrate (900mm <sup>2</sup> ×0.8mm) 1unit	0.8		W
Channel Temperature	$T_{ch}$		150		$^\circ\text{C}$
Storage Temperature	$T_{stg}$		-55 to +150		$^\circ\text{C}$

### Package Dimensions

unit : mm (typ)

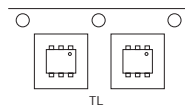
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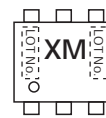
### Product & Package Information

- Package : MCPH6
- JEITA, JEDEC : SC-88, SC-70-6, SOT-363
- Minimum Packing Quantity : 3,000 pcs./reel

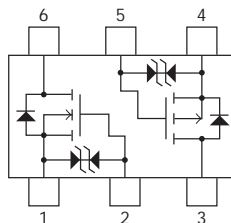
### Packing Type : TL



### Marking



### Electrical Connection



# MCH6660

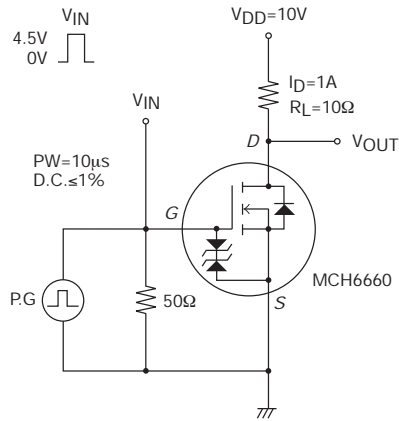
## Electrical Characteristics at $T_a=25^\circ\text{C}$

Parameter	Symbol	Conditions	Ratings			Unit
			min	typ	max	
[N-channel]						
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	$\mu\text{A}$
Gate-to-Source Leakage Current	$I_{GSS}$	$V_{GS}=\pm 8\text{V}, V_{DS}=0\text{V}$			$\pm 10$	$\mu\text{A}$
Cutoff Voltage	$V_{GS(off)}$	$V_{DS}=10\text{V}, I_D=1\text{mA}$	0.4		1.3	V
Forward Transfer Admittance	$ y_{fs} $	$V_{DS}=10\text{V}, I_D=1\text{A}$		1.9		S
Static Drain-to-Source On-State Resistance	$R_{DS(on)1}$	$I_D=1\text{A}, V_{GS}=4.5\text{V}$		105	136	$\text{m}\Omega$
	$R_{DS(on)2}$	$I_D=0.5\text{A}, V_{GS}=2.5\text{V}$		147	205	$\text{m}\Omega$
	$R_{DS(on)3}$	$I_D=0.3\text{A}, V_{GS}=1.8\text{V}$		212	318	$\text{m}\Omega$
Input Capacitance	$C_{iss}$	$V_{DS}=10\text{V}, f=1\text{MHz}$		128		pF
Output Capacitance	$C_{oss}$			28		pF
Reverse Transfer Capacitance	$C_{rss}$			21		pF
Turn-ON Delay Time	$t_{d(on)}$			5.1		ns
Rise Time	$t_r$	See specified Test Circuit.		11		ns
Turn-OFF Delay Time	$t_{d(off)}$			14.5		ns
Fall Time	$t_f$			12		ns
Total Gate Charge	$Q_g$		$V_{DS}=10\text{V}, V_{GS}=4.5\text{V}, I_D=2\text{A}$		1.8	
Gate-to-Source Charge	$Q_{gs}$			0.3		nC
Gate-to-Drain "Miller" Charge	$Q_{gd}$			0.55		nC
Diode Forward Voltage	$V_{SD}$	$I_S=2\text{A}, V_{GS}=0\text{V}$			0.85	1.2
[P-channel]						
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	$\mu\text{A}$
Gate-to-Source Leakage Current	$I_{GSS}$	$V_{GS}=\pm 8\text{V}, V_{DS}=0\text{V}$			$\pm 10$	$\mu\text{A}$
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	$Q_g$		$V_{DS}=-10\text{V}, V_{GS}=-4.5\text{V}, I_D=-1.5\text{A}$		1.7	
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

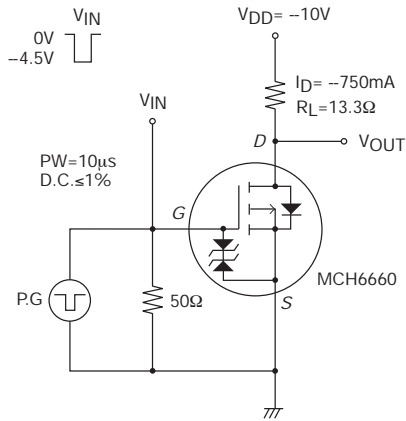
# MCH6660

## Switching Time Test Circuit

[N-channel]

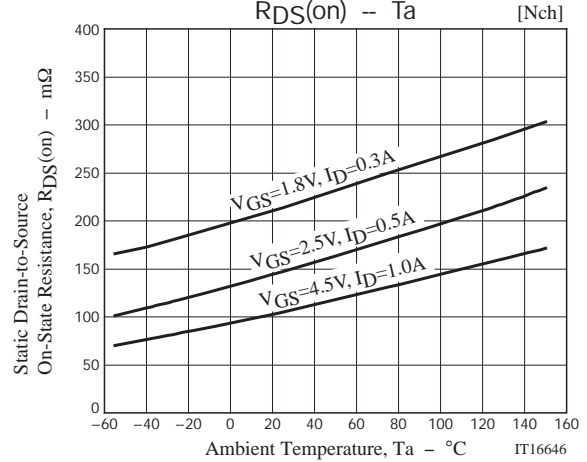
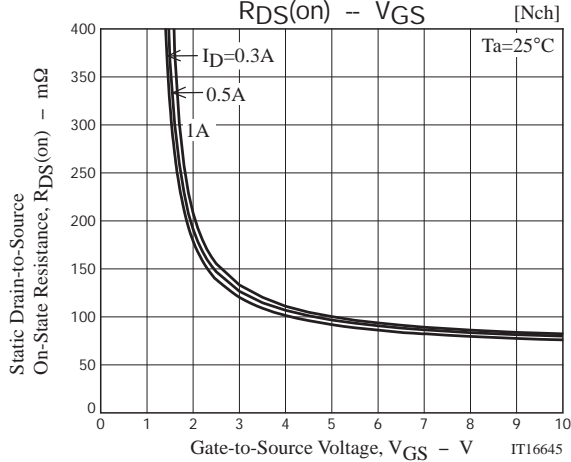
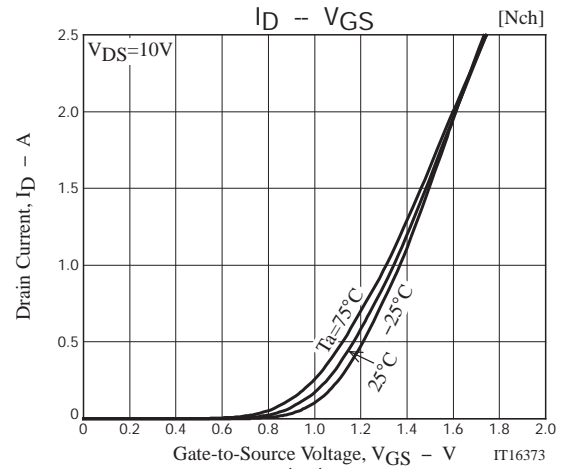
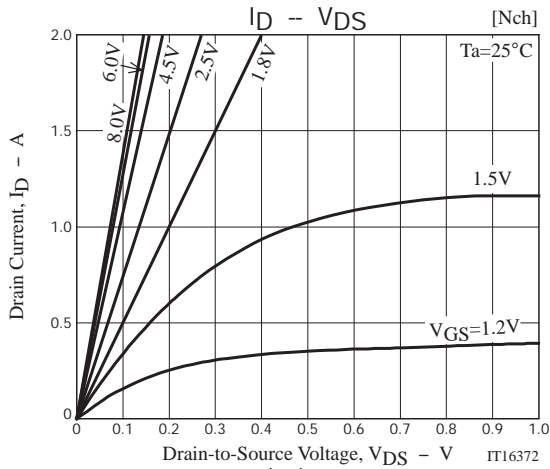


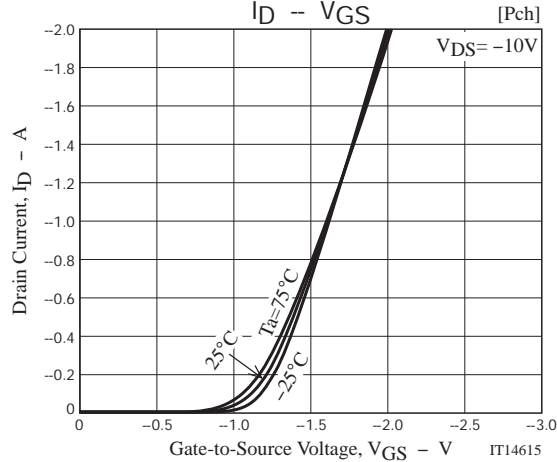
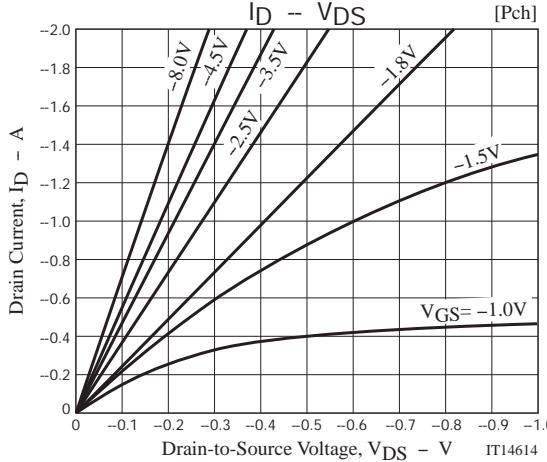
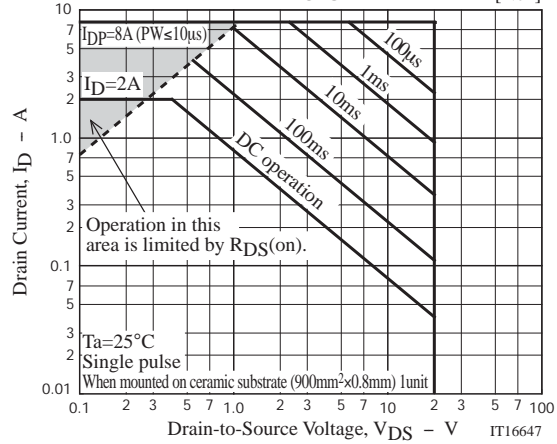
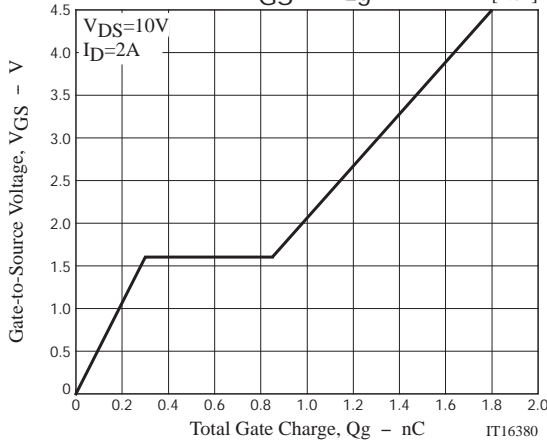
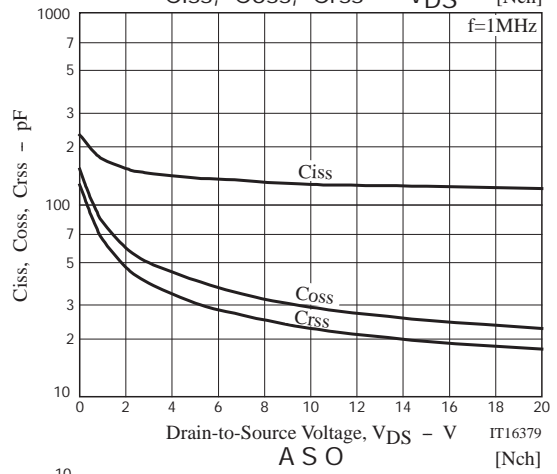
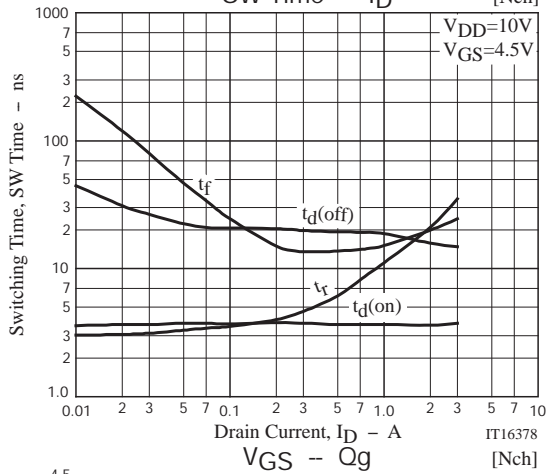
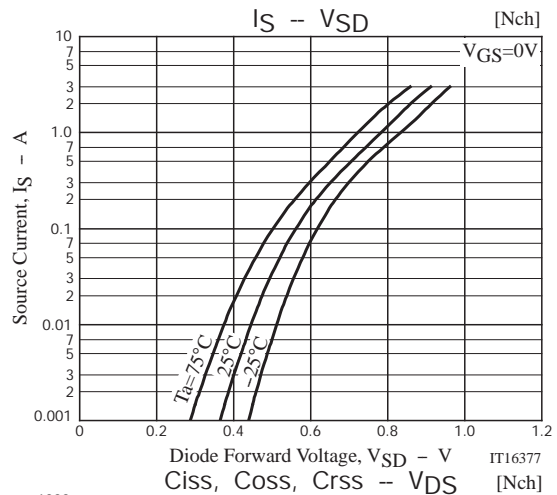
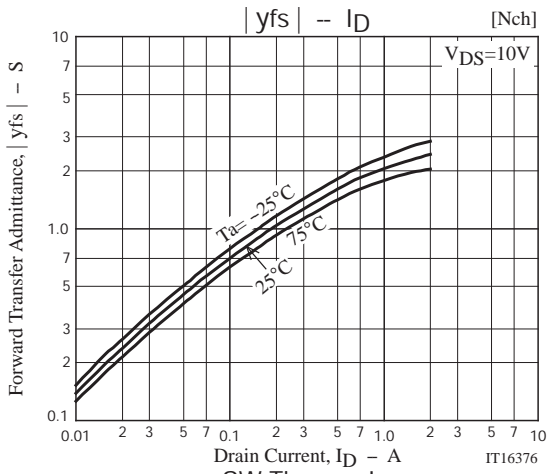
[P-channel]

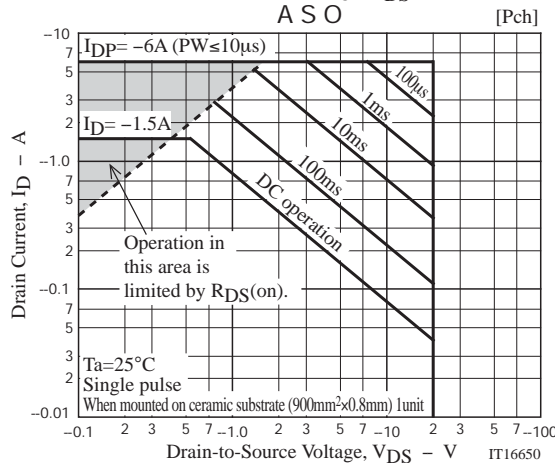
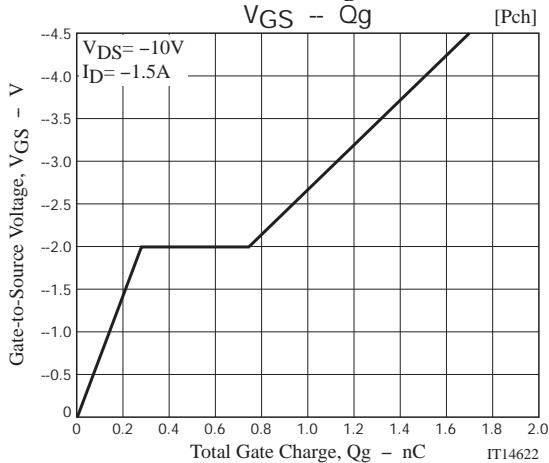
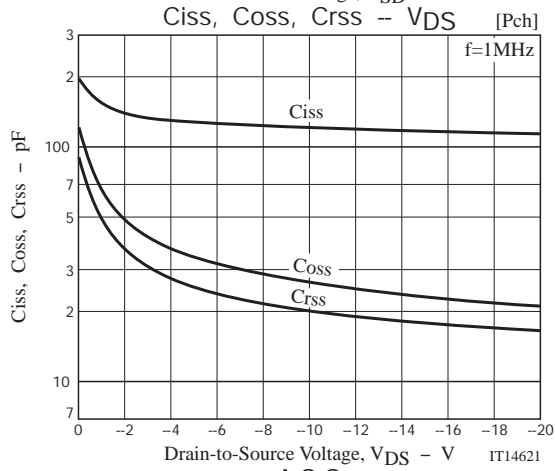
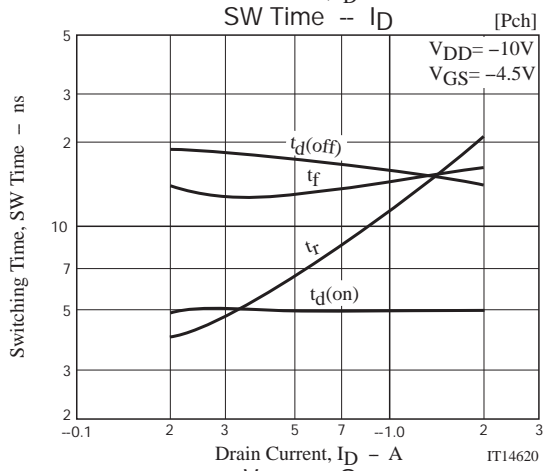
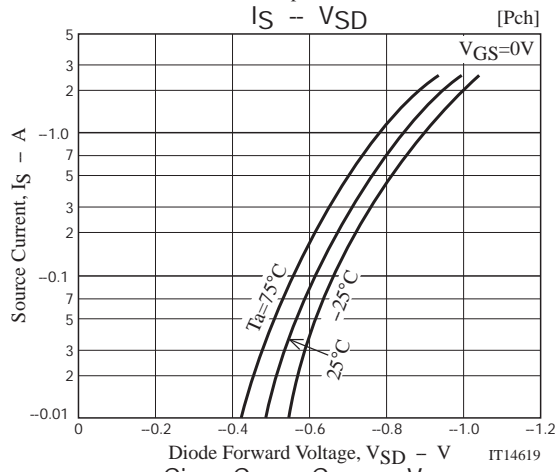
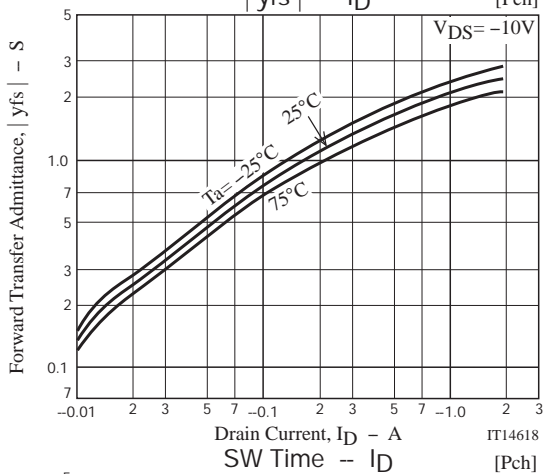
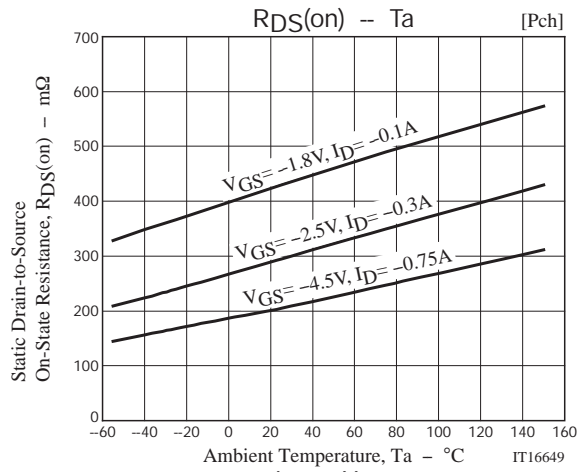
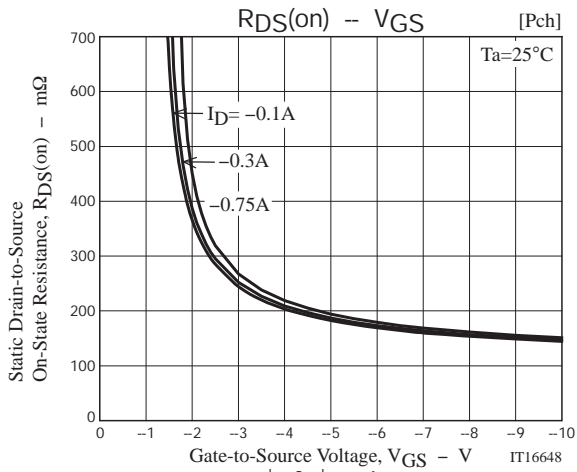


## Ordering Information

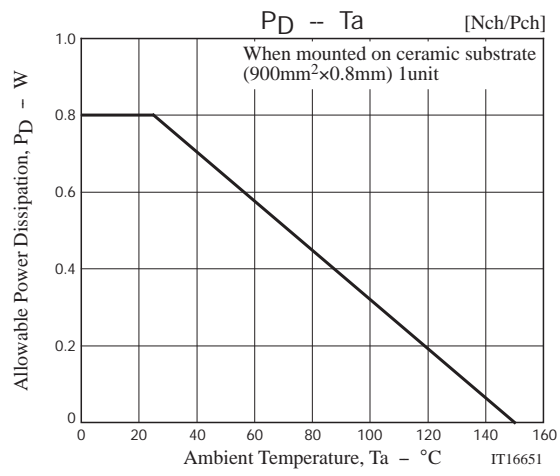
Device	Package	Shipping	memo
MCH6660-TL-H	MCPH6	3,000pcs./reel	Pb Free and Halogen Free







# MCH6660



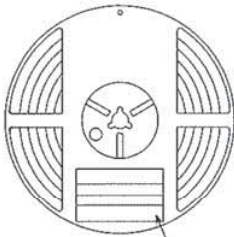
Embossed Taping Specification

MCH6660-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)
MCPH6	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.



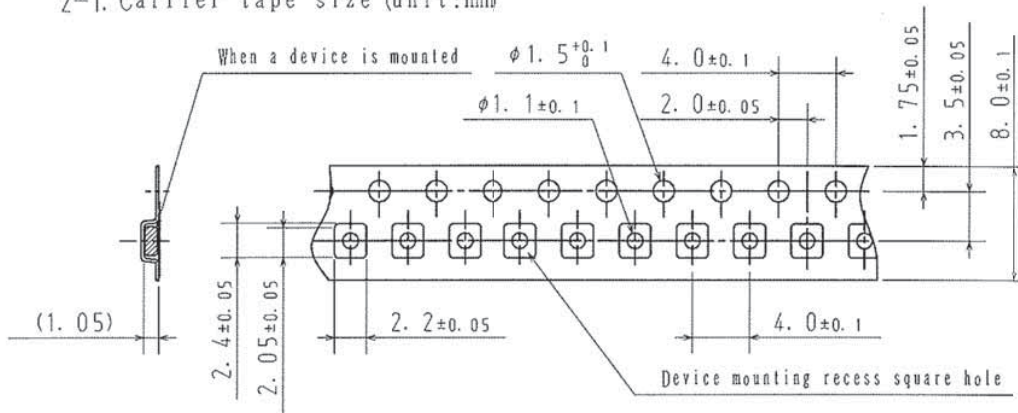
NOTE (1)

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

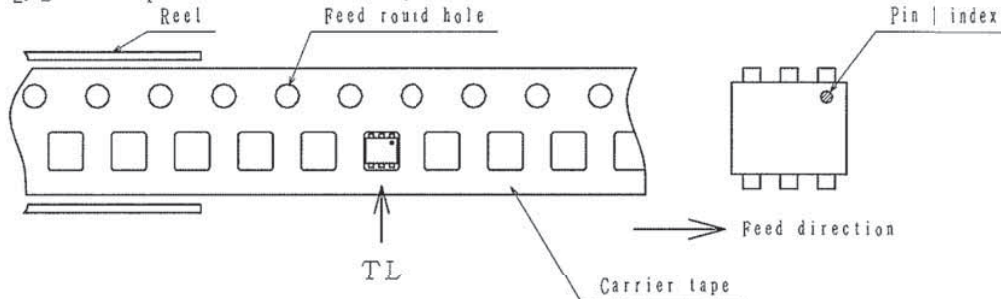
Label	JEITA Phase
LEAD FREE 3	JEITA Phase 3A
LEAD FREE 4	JEITA Phase 3

2. Taping configuration

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



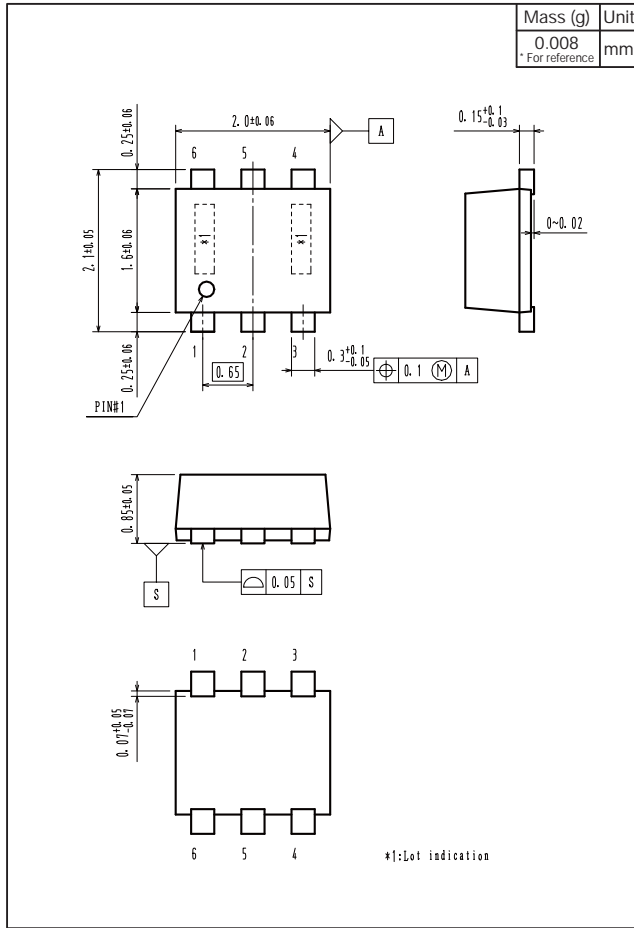
2-2. Device placement direction



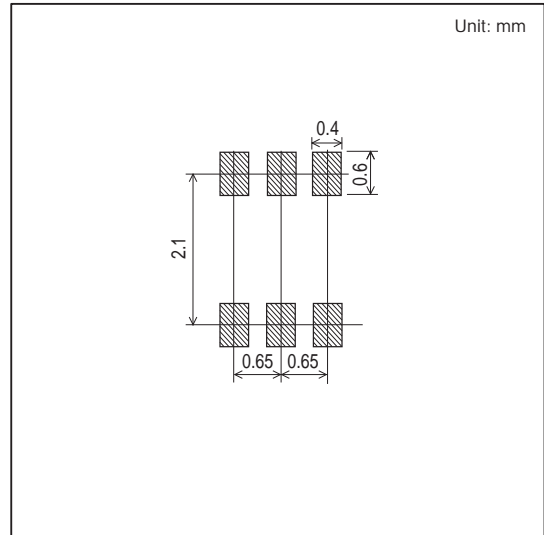
Those with pin | index on the feed hole side.....TL

# MCH6660

## Outline Drawing MCH6660-TL-H



## Land Pattern Example





Note on usage : Since the MCH6660 is a MOSFET product, please avoid using this device in the vicinity of highly charged objects.

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