



N-Channel and P-Channel Silicon MOSFET

MCH6613 — General-Purpose Switching Device Applications

Features

- The MCH6613 incorporates two elements in the same package which are N-channel and P-channel low ON resistance and high-speed switching MOSFETs, thereby enabling high-density mounting
- Excellent ON-resistance characteristic
- 1.5V drive

Specifications

Absolute Maximum Ratings at Ta=25°C

Parameter	Symbol	Conditions	N-channel	P-channel	Unit
Drain-to-Source Voltage	V _{DSS}		30	-30	V
Gate-to-Source Voltage	V _{GSS}		±10	±10	V
Drain Current (DC)	I _D		0.35	-0.2	A
Drain Current (Pulse)	I _{DP}	PW≤10μs, duty cycles≤1%	1.4	-0.8	A
Allowable Power Dissipation	P _D	When mounted on ceramic substrate (900mm ² ×0.8mm) 1unit	0.8		W
Channel Temperature	T _{ch}		150		°C
Storage Temperature	T _{stg}		-55 to +150		°C

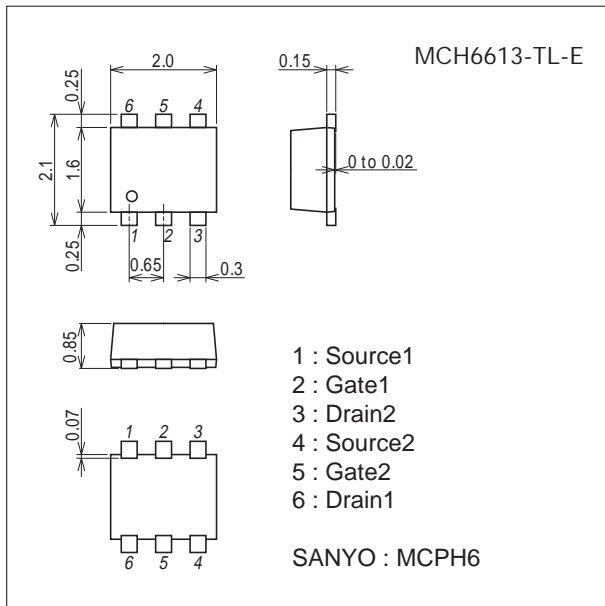
This product is designed to "ESD immunity < 200V**", so please take care when handling.

* Machine Model

Package Dimensions

unit : mm (typ)

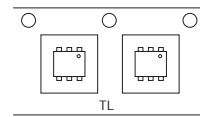
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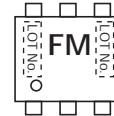
Product & Package Information

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

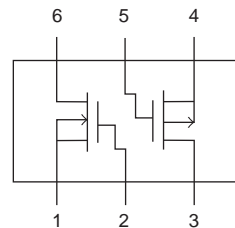
Packing Type : TL



Marking



Electrical Connection



MCH6613

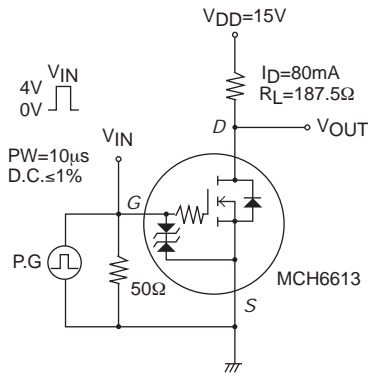
Electrical Characteristics at Ta=25°C

Parameter	Symbol	Conditions	Ratings			Unit
			min	typ	max	
[N-channel]						
Drain-to-Source Breakdown Voltage	V(BR)DSS	ID=1mA, VGS=0V	30			V
Zero-Gate Voltage Drain Current	IDSS	VDS=30V, VGS=0V			1	μA
Gate-to-Source Leakage Current	IGSS	VGS=±8V, VDS=0V			±10	μA
Cutoff Voltage	VGS(off)	VDS=10V, ID=100μA	0.4		1.3	V
Forward Transfer Admittance	yfs	VDS=10V, ID=80mA	150	220		mS
Static Drain-to-Source On-State Resistance	RDS(on)1	ID=80mA, VGS=4V		2.9	3.7	Ω
	RDS(on)2	ID=40mA, VGS=2.5V		3.7	5.2	Ω
	RDS(on)3	ID=10mA, VGS=1.5V		6.4	12.8	Ω
Input Capacitance	Ciss	VDS=10V, f=1MHz		7.0		pF
Output Capacitance	Coss			5.9		pF
Reverse Transfer Capacitance	Crss			2.3		pF
Turn-ON Delay Time	t _{d(on)}		See specified Test Circuit.		19	
Rise Time	t _r			65		ns
Turn-OFF Delay Time	t _{d(off)}			155		ns
Fall Time	t _f			120		ns
Total Gate Charge	Qg	VDS=10V, VGS=10V, ID=150mA			1.58	
Gate-to-Source Charge	Qgs			0.26		nC
Gate-to-Drain "Miller" Charge	Qgd			0.31		nC
Diode Forward Voltage	VSD		IS=150mA, VGS=0V		0.87	1.2
[P-channel]						
Drain-to-Source Breakdown Voltage	V(BR)DSS	ID=-1mA, VGS=0V	-30			V
Zero-Gate Voltage Drain Current	IDSS	VDS=-30V, VGS=0V			-1	μA
Gate-to-Source Leakage Current	IGSS	VGS=±8V, VDS=0V			±10	μA
Cutoff Voltage	VGS(off)	VDS=-10V, ID=-100μA	-0.4		-1.4	V
Forward Transfer Admittance	yfs	VDS=-10V, ID=-50mA	80	110		mS
Static Drain-to-Source On-State Resistance	RDS(on)1	ID=-50mA, VGS=-4V		8	10.4	Ω
	RDS(on)2	ID=-30mA, VGS=-2.5V		11	15.4	Ω
	RDS(on)3	ID=-1mA, VGS=-1.5V		27	54	Ω
Input Capacitance	Ciss	VDS=-10V, f=1MHz		7.5		pF
Output Capacitance	Coss			5.7		pF
Reverse Transfer Capacitance	Crss			1.8		pF
Turn-ON Delay Time	t _{d(on)}		See specified Test Circuit.		24	
Rise Time	t _r			55		ns
Turn-OFF Delay Time	t _{d(off)}			120		ns
Fall Time	t _f			130		ns
Total Gate Charge	Qg	VDS=-10V, VGS=-10V, ID=-100mA			1.43	
Gate-to-Source Charge	Qgs			0.18		nC
Gate-to-Drain "Miller" Charge	Qgd			0.25		nC
Diode Forward Voltage	VSD		IS=-100mA, VGS=0V		-0.83	-1.2

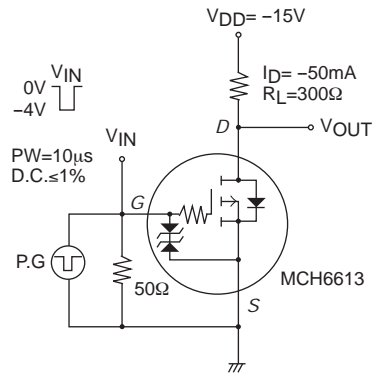
MCH6613

Switching Time Test Circuit

[N-channel]

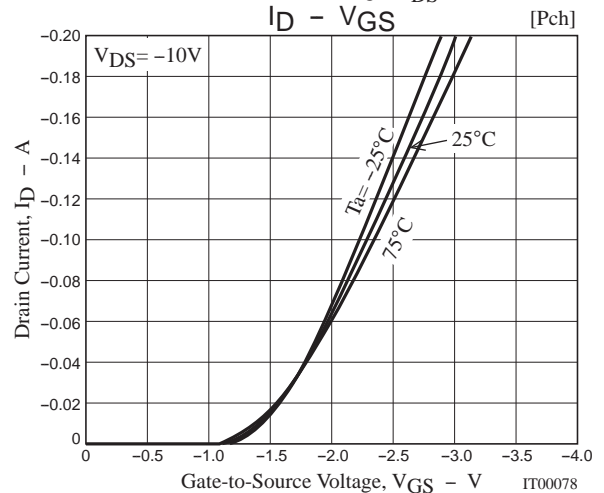
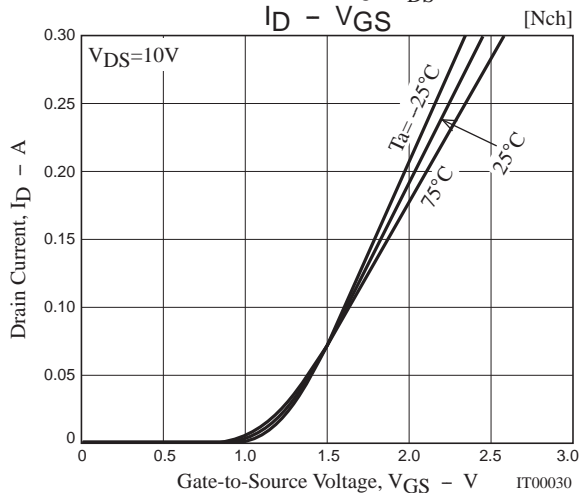
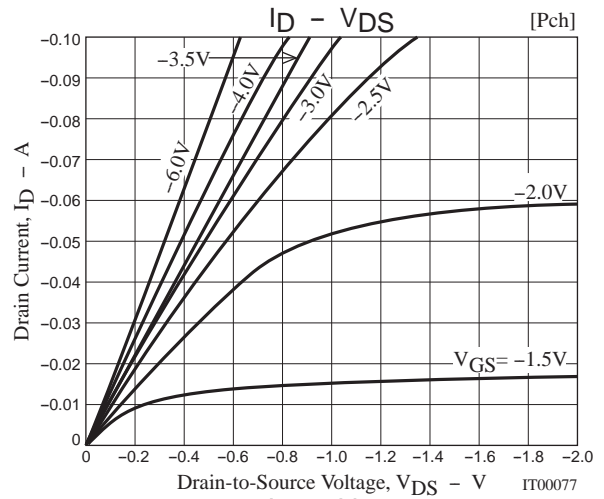
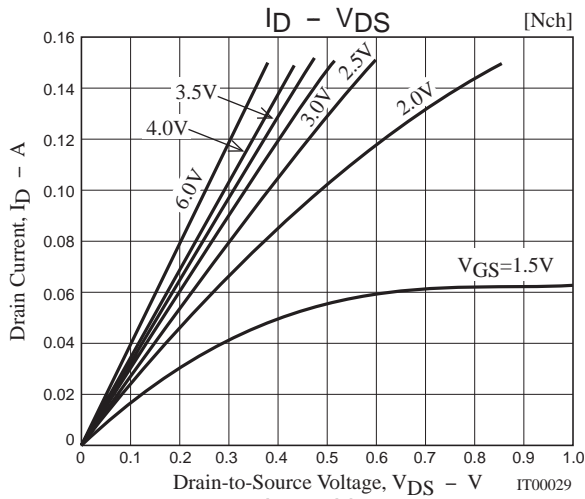


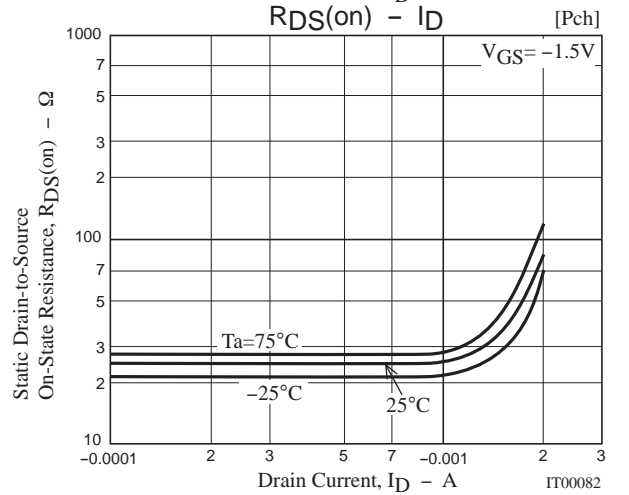
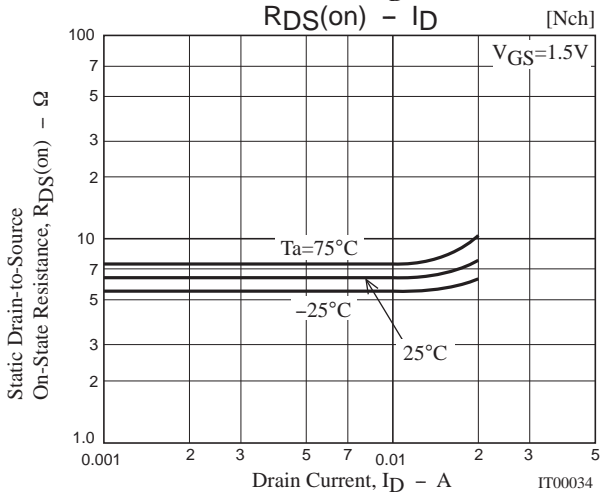
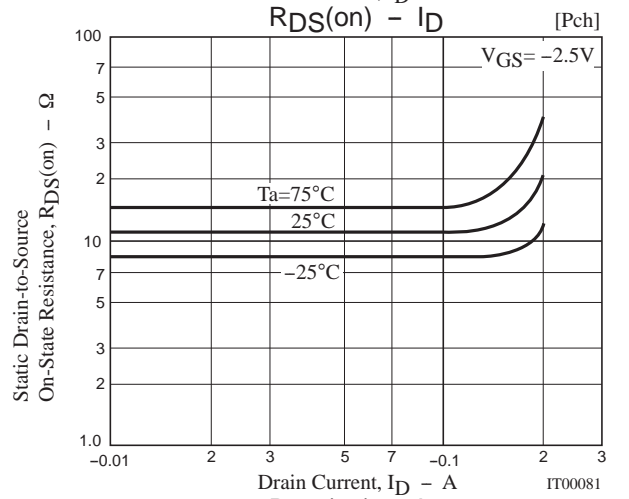
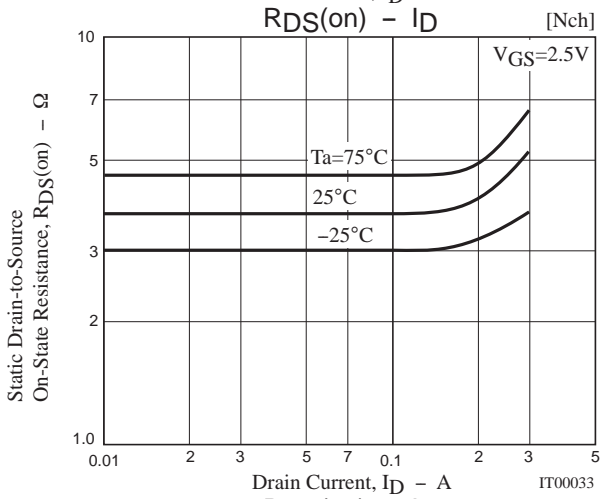
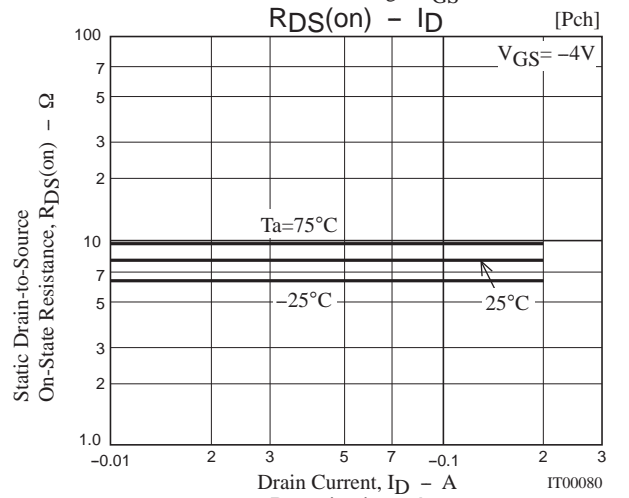
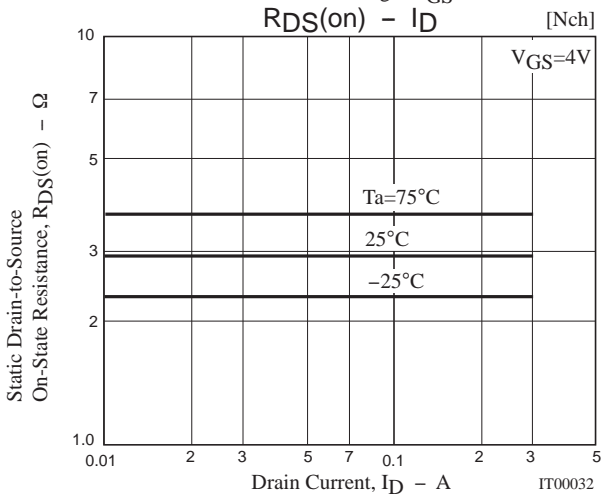
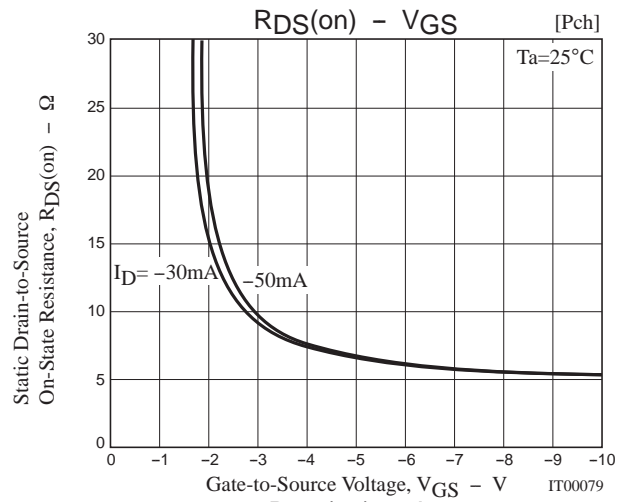
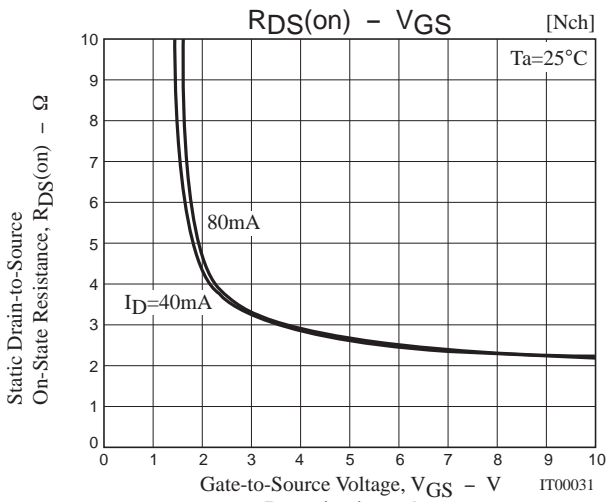
[P-channel]

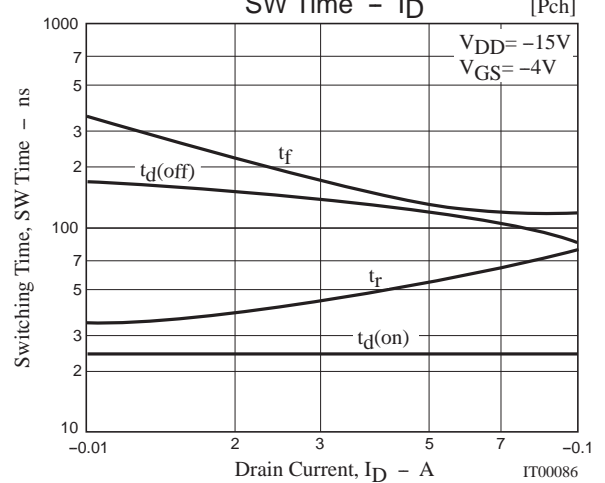
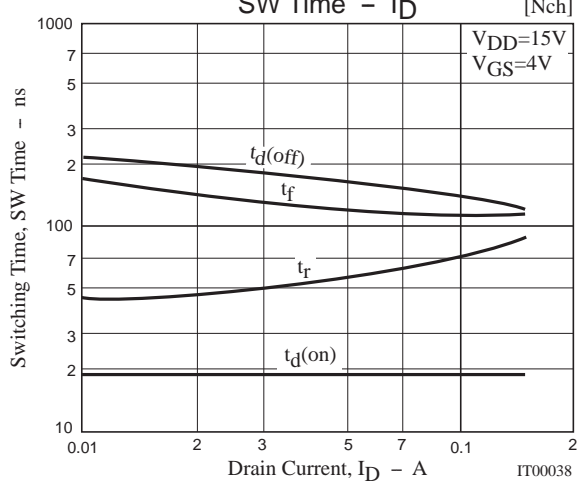
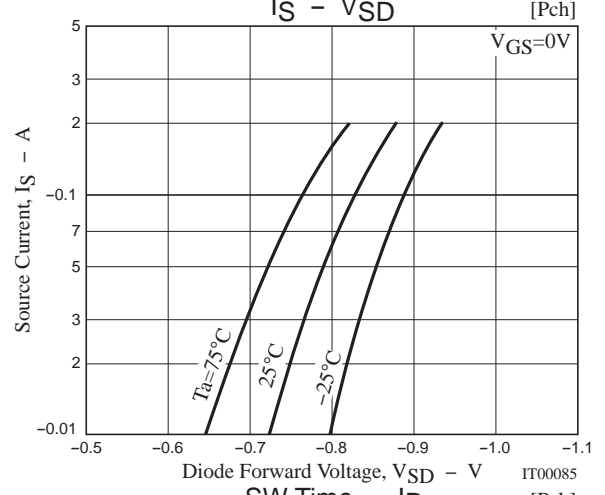
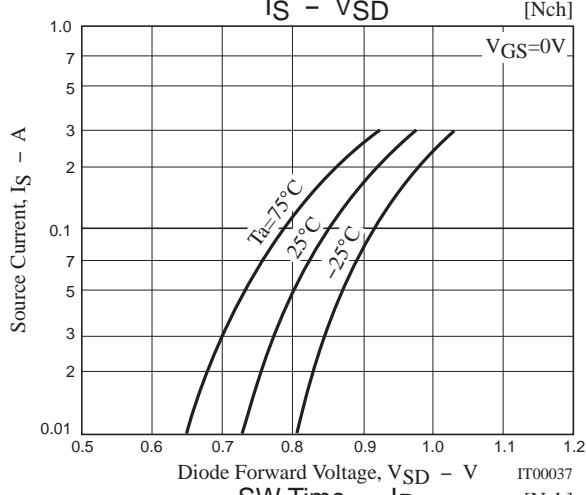
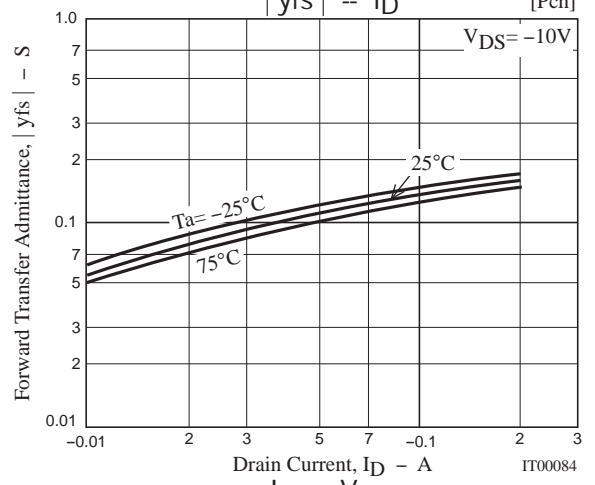
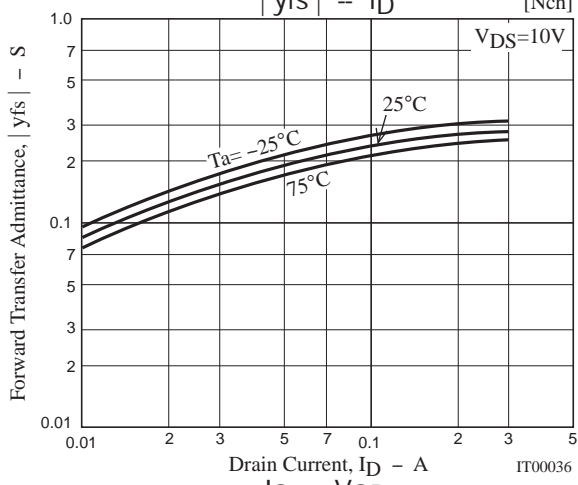
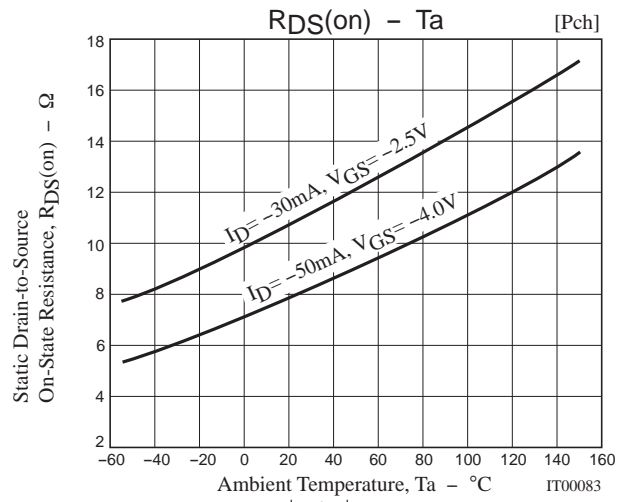
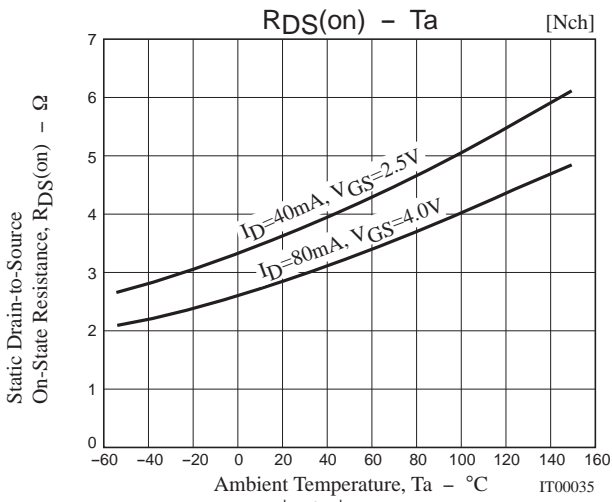


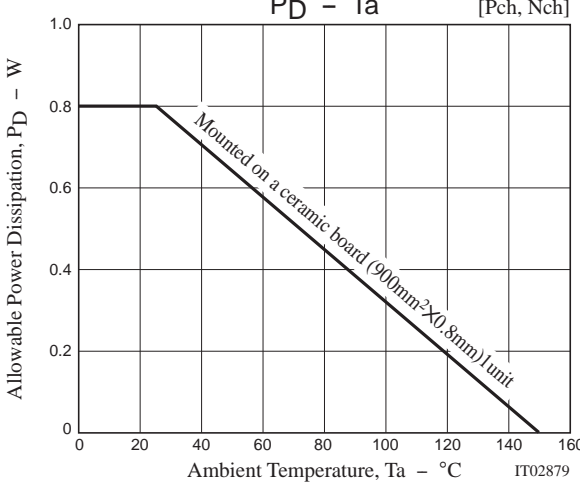
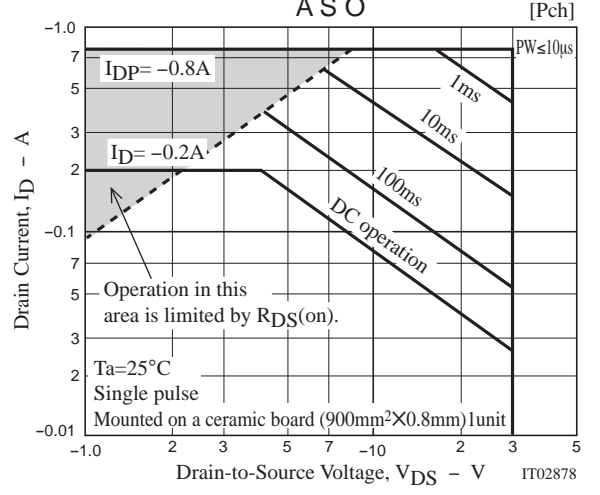
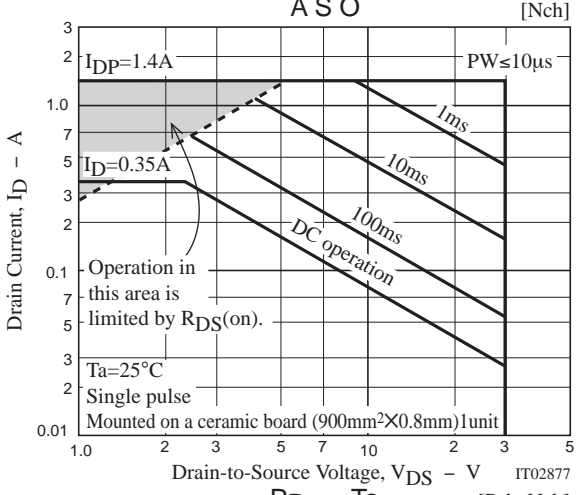
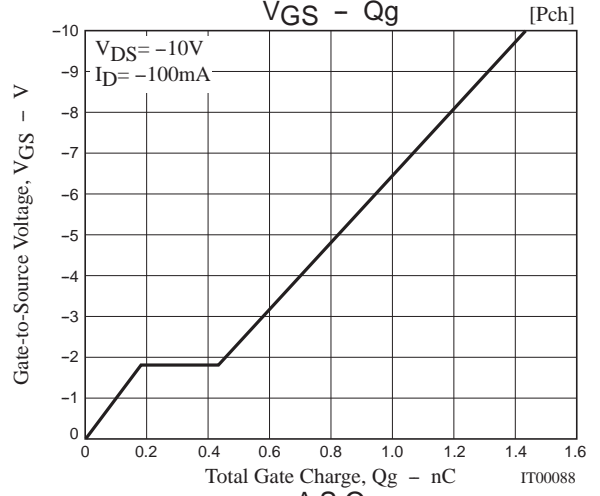
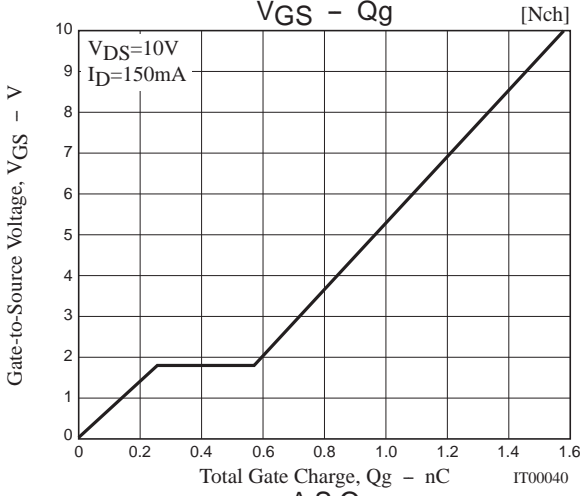
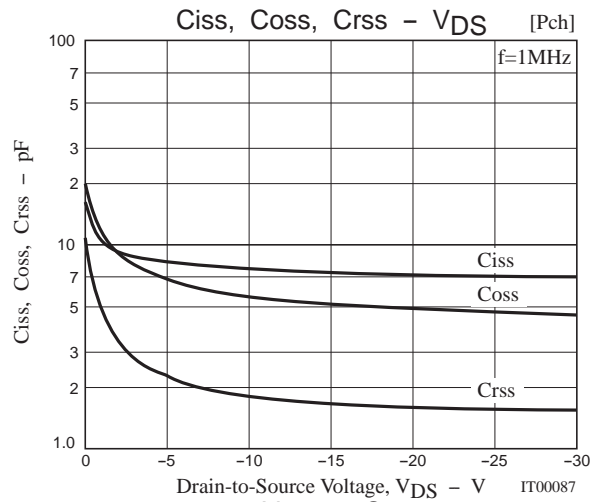
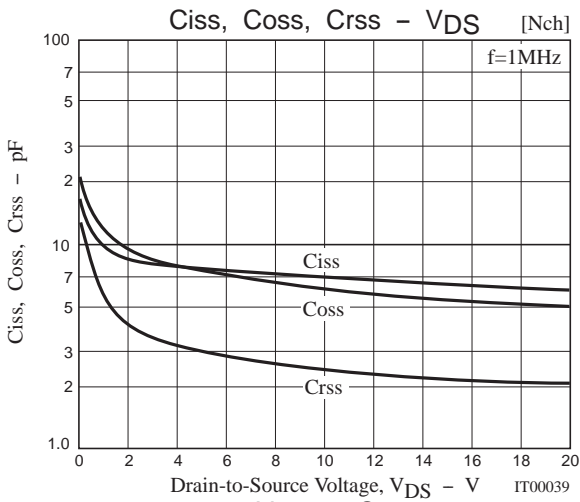
Ordering Information

Device	Package	Shipping	memo
MCH6613-TL-E	MCPH6	3,000pcs./reel	Pb Free









MCH6613

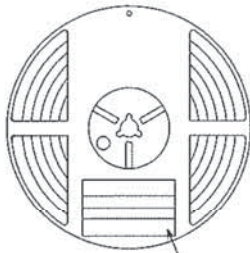
Embossed Taping Specification

MCH6613-TL-E

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

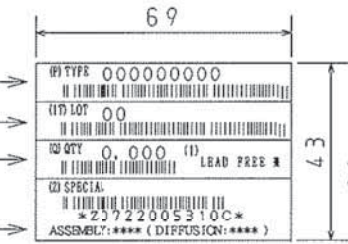
Packing method



Reel label

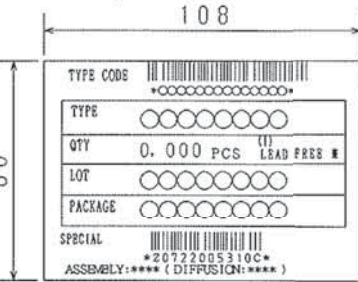
Type No.
LOT No.
Quantity
Origin

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.)



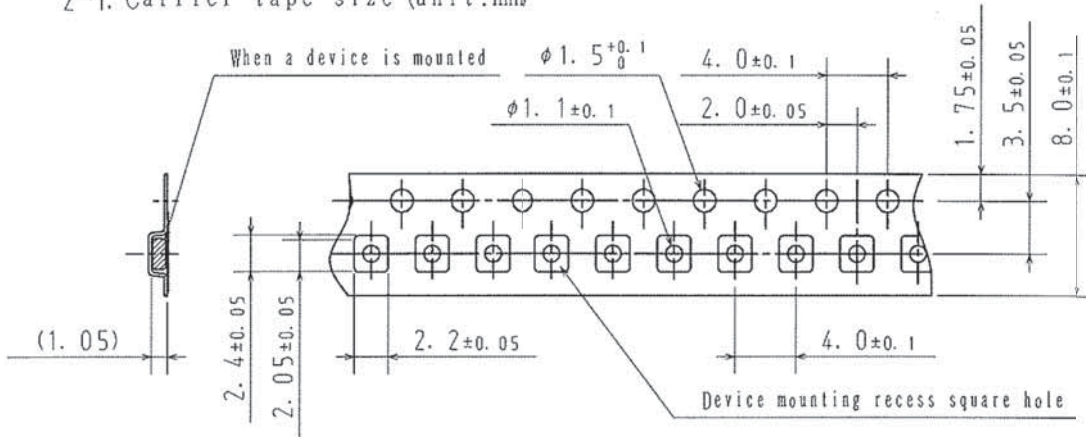
NOTE (1)

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

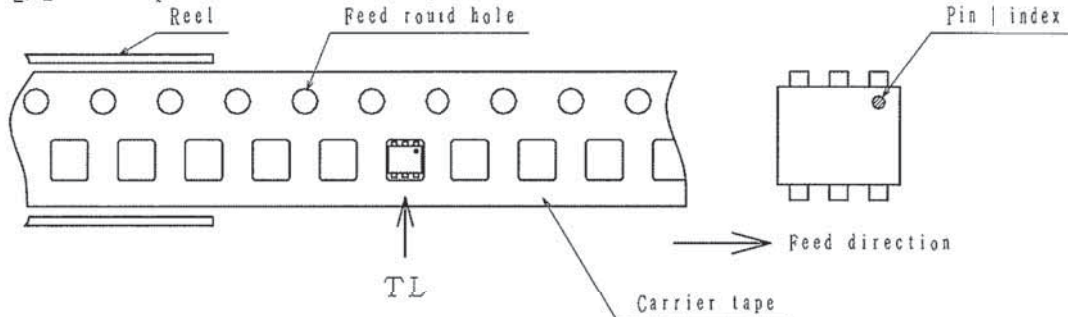
Label	JEITA Phase
LEAD FREE 3	JEITA Phase 3A
LEAD FREE 4	JEITA Phase 3

2. Taping configuration

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



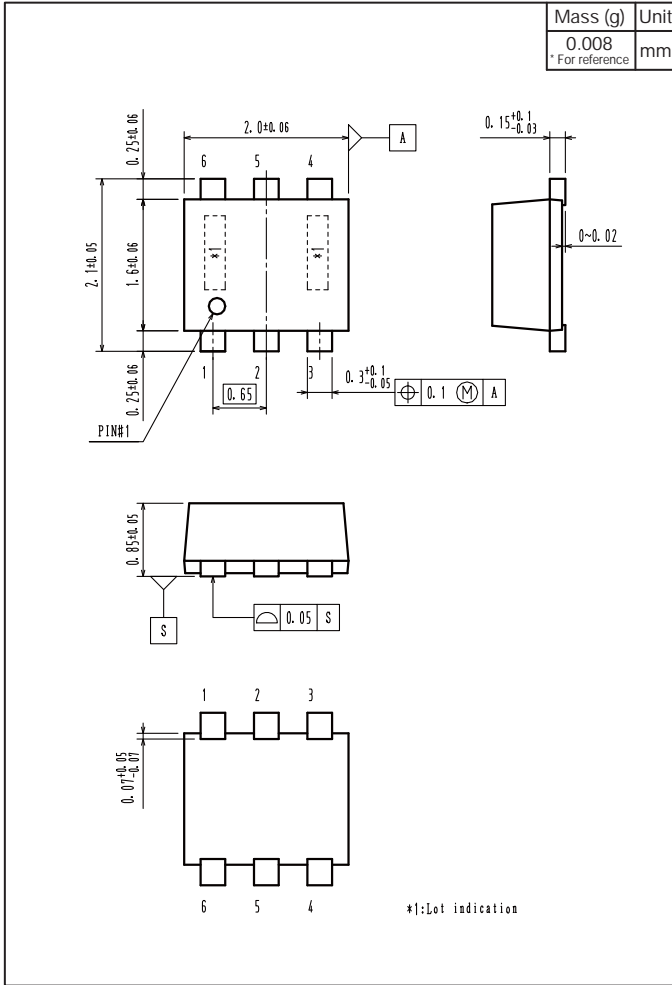
2-2. Device placement direction



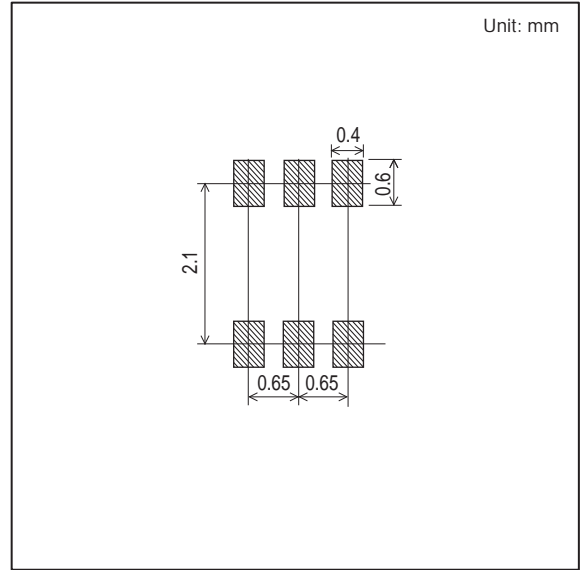
Those with pin | index on the feed hole side.....TL

MCH6613

Outline Drawing MCH6613-TL-E



Land Pattern Example



Note on usage : Since the MCH6613 is a MOSFET product, please avoid using this device in the vicinity of highly charged objects.

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