Ordering number : EN9000A

SANYO Semiconductors

DATA SHEET

An ON Semiconductor Company

P-Channel Silicon MOSFET

MCH3383 — Low Voltage Drive Switching Device Applications

Features

- ON-resistance $R_{DS}(on)1$=57mΩ (typ.)
- 0.9V drive
- Halogen free compliance
- Protection diode in

Specifications

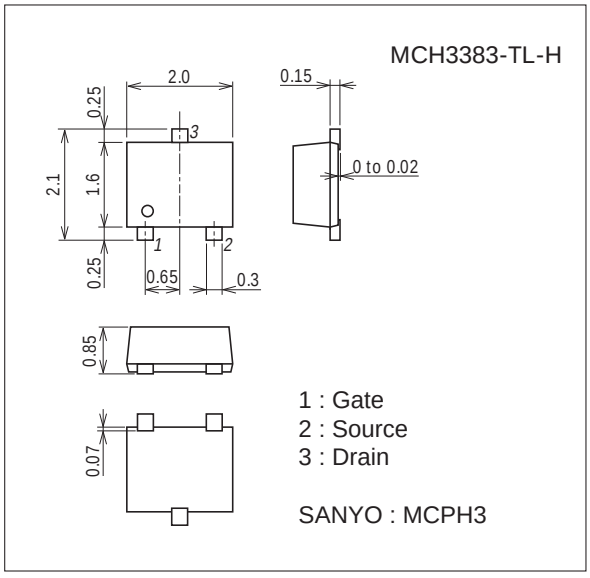
Absolute Maximum Ratings at Ta=25°C

Parameter	Symbol	Conditions	Ratings	Unit
Drain-to-Source Voltage	V_{DSS}		−12	V
Gate-to-Source Voltage	V_{GSS}		±5	V
Drain Current (DC)	I_D		−3.5	A
Drain Current (Pulse)	I_{DP}	PW≤10μs, duty cycle≤1%	−14	A
Allowable Power Dissipation	P_D	When mounted on ceramic substrate (900mm²×0.8mm)	1.0	W
Channel Temperature	Tch		150	°C
Operating Temperature	Topr		−5 to +150	°C
Storage Temperature	Tstg		−55 to +150	°C

Package Dimensions

unit : mm (typ)

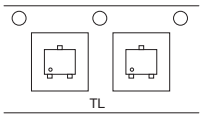
7019A-003



Product & Package Information

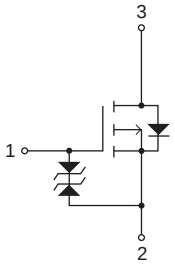
- Package : MCPH3
- JEITA, JEDEC : SC-70, SOT-323
- Minimum Packing Quantity : 3,000 pcs./reel

Packing Type : TL



Marking

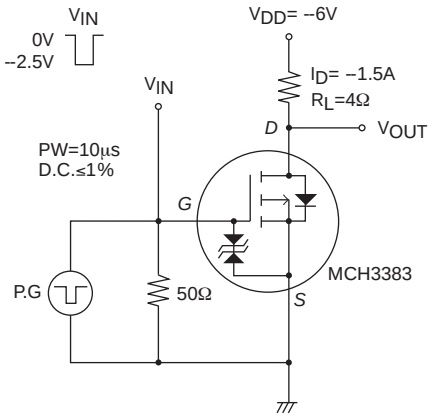
Electrical Connection



Electrical Characteristics at Ta=25°C

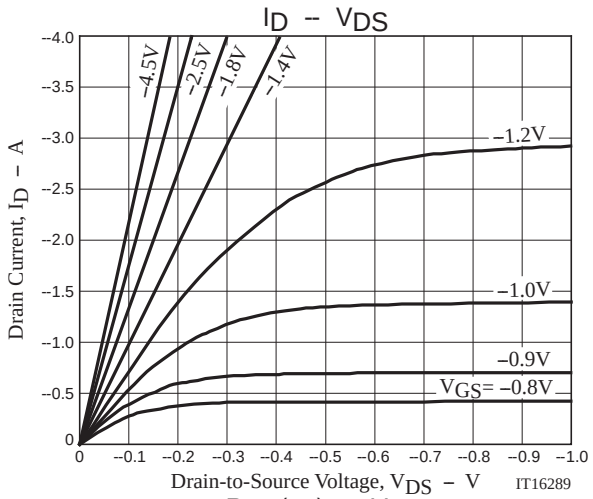
Parameter	Symbol	Conditions	Ratings			Unit
			min	typ	max	
Drain-to-Source Breakdown Voltage	$V_{(BR)DSS}$	I_D=−1mA, V_{GS}=0V	−12			V
Zero-Gate Voltage Drain Current	I_{DSS}	V_{DS}=−12V, V_{GS}=0V			−10	μA
Gate-to-Source Leakage Current	I_{GSS}	V_{GS}=±4V, V_{DS}=0V			±10	μA
Cutoff Voltage	V_{GS}(off)	V_{DS}=−6V, I_D=−1mA	−0.3		−0.8	V
Forward Transfer Admittance	| yfs |	V_{DS}=−6V, I_D=−1.5A		5.3		S
Static Drain-to-Source On-State Resistance	R_{DS}(on)1	I_D=−1.5A, V_{GS}=−2.5V		57	69	mΩ
	R_{DS}(on)2	I_D=−0.7A, V_{GS}=−1.8V		75	98	mΩ
	R_{DS}(on)3	I_D=−0.3A, V_{GS}=−1.2V		115	173	mΩ
	R_{DS}(on)4	I_D=−50mA, V_{GS}=−0.9V		250	500	mΩ
Input Capacitance	Ciss	V_{DS}=−6V, f=1MHz		1010		pF
Output Capacitance	Coss	V_{DS}=−6V, f=1MHz		130		pF
Reverse Transfer Capacitance	Crss	V_{DS}=−6V, f=1MHz		85		pF
Turn-ON Delay Time	t_d(on)	See specified Test Circuit.		9.9		ns
Rise Time	t_r	See specified Test Circuit.		49		ns
Turn-OFF Delay Time	t_d(off)	See specified Test Circuit.		109		ns
Fall Time	t_f	See specified Test Circuit.		65		ns
Total Gate Charge	Qg	V_{DS}=−6V, V_{GS}=−2.5V, I_D=−3.5A		6.2		nC
Gate-to-Source Charge	Qgs	V_{DS}=−6V, V_{GS}=−2.5V, I_D=−3.5A		1.6		nC
Gate-to-Drain “Miller” Charge	Qgd	V_{DS}=−6V, V_{GS}=−2.5V, I_D=−3.5A		1.1		nC
Diode Forward Voltage	V_{SD}	I_S=−3.5A, V_{GS}=0V		−0.83	−1.2	V

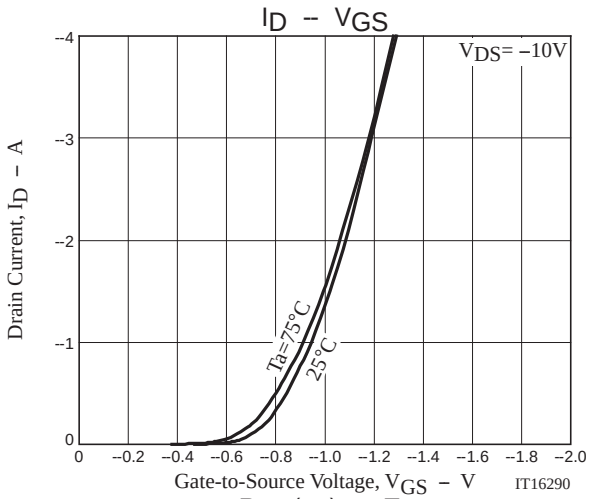
Switching Time Test Circuit

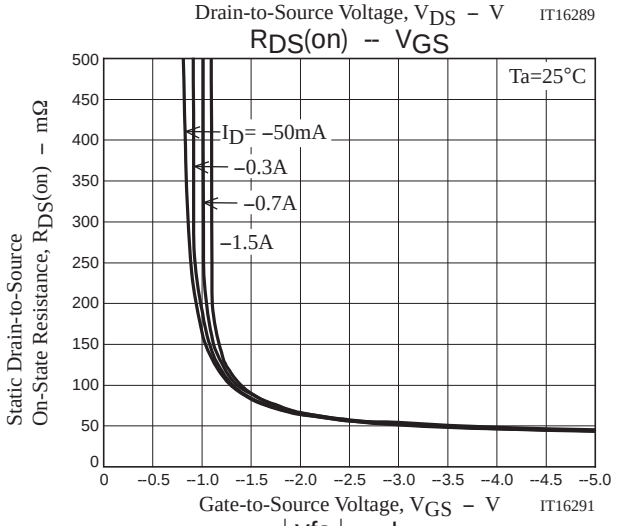


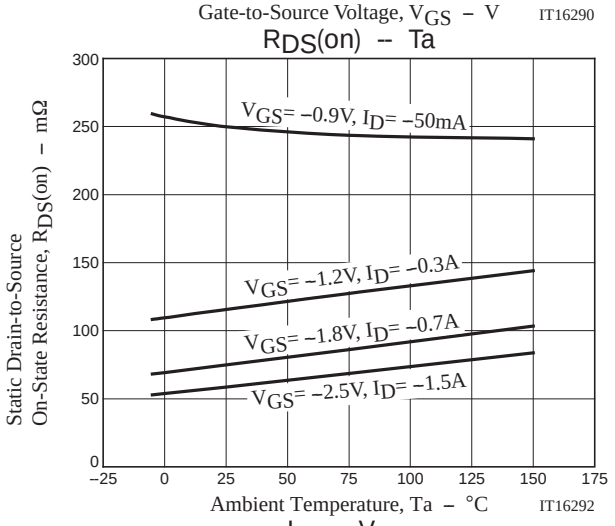
Ordering Information

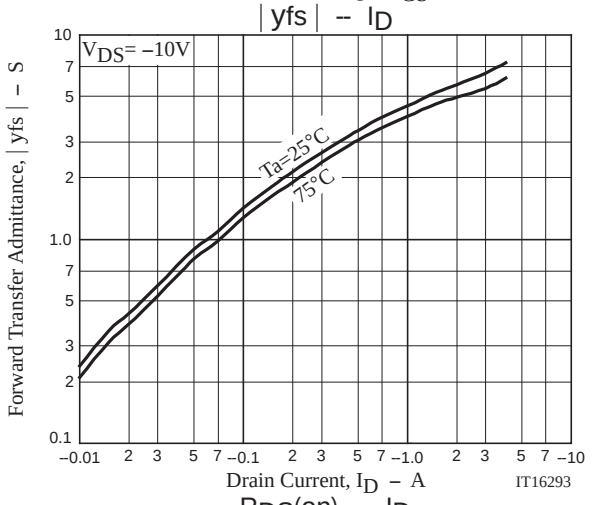
Device	Package	Shipping	memo
MCH3383-TL-H	MCPH3	3,000pcs./reel	Pb Free and Halogen Free

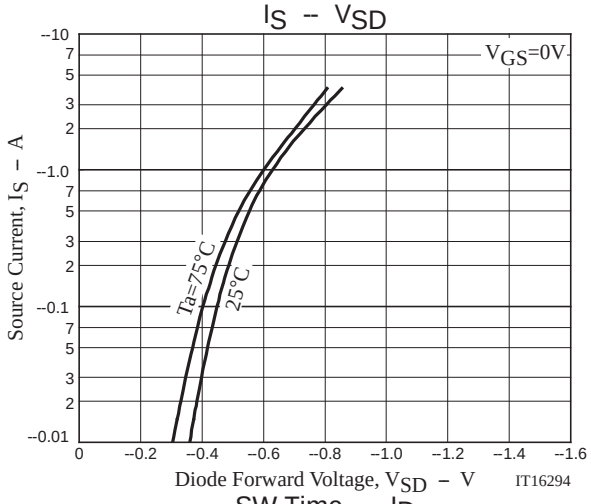

ID -- VDS
Drain Current, ID – A
Drain-to-Source Voltage, VDS – V
IT16289
–4.5V
–2.5V
–1.8V
–1.4V
–1.2V
–1.0V
–0.9V
VGS= –0.8V

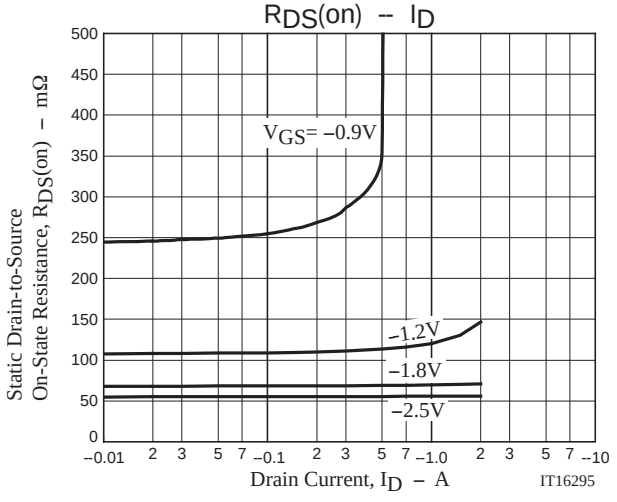

ID -- VGS
Drain Current, ID – A
Gate-to-Source Voltage, VGS – V
IT16290
VDS= –10V
Ta=75°C
25°C

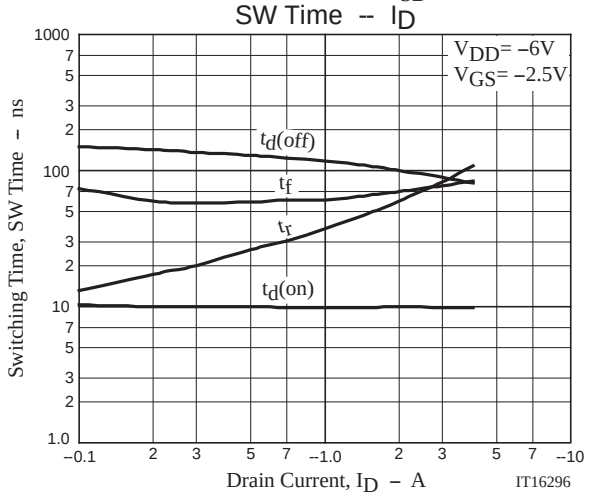

RDS(on) -- VGS
Static Drain-to-Source On-State Resistance, RDS(on) – mΩ
Gate-to-Source Voltage, VGS – V
IT16291
Ta=25°C
ID= –50mA
–0.3A
–0.7A
–1.5A

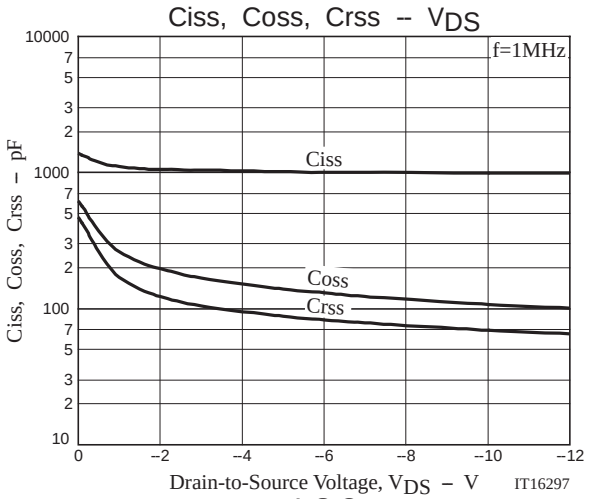

RDS(on) -- Ta
Static Drain-to-Source On-State Resistance, RDS(on) – mΩ
Ambient Temperature, Ta – °C
IT16292
VGS= –0.9V, ID= –50mA
VGS= –1.2V, ID= –0.3A
VGS= –1.8V, ID= –0.7A
VGS= –2.5V, ID= –1.5A

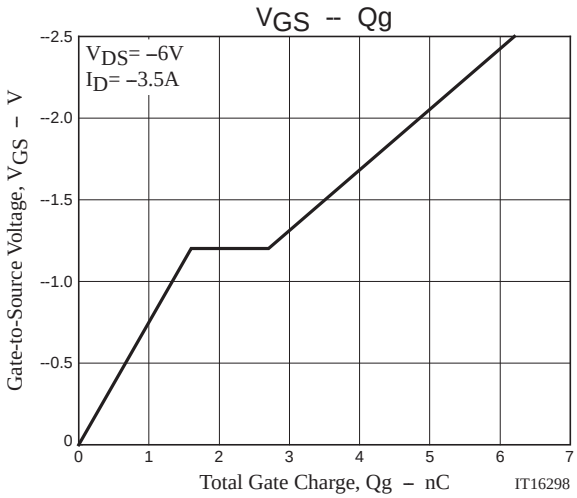

| yfs | -- ID
Forward Transfer Admittance, | yfs | – S
Drain Current, ID – A
IT16293
VDS= –10V
Ta=25°C
75°C

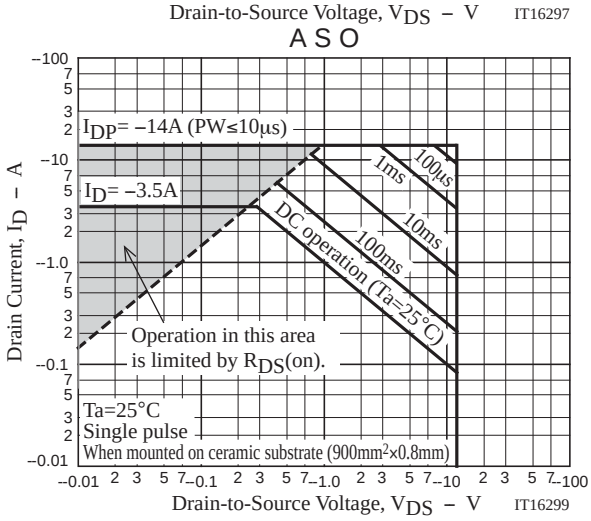

IS -- VSD
Source Current, IS – A
Diode Forward Voltage, VSD – V
IT16294
VGS=0V
Ta=75°C
25°C

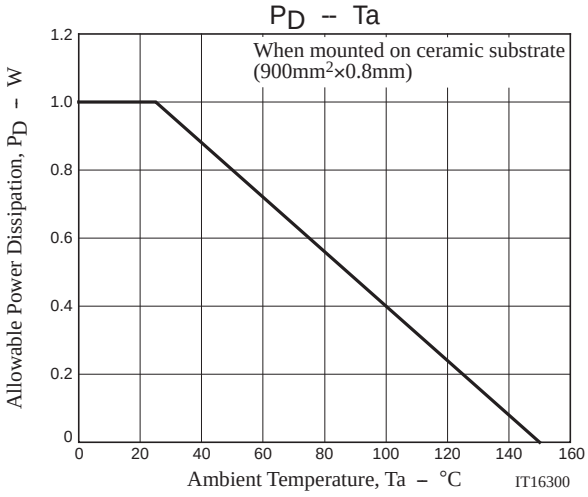

RDS(on) -- ID
Static Drain-to-Source On-State Resistance, RDS(on) – mΩ
Drain Current, ID – A
IT16295
VGS= –0.9V
–1.2V
–1.8V
–2.5V


SW Time -- ID
Switching Time, SW Time – ns
Drain Current, ID – A
IT16296
VDD= –6V
VGS= –2.5V
td(off)
tf
tr
td(on)


Ciss, Coss, Crss – VDS
f=1MHz
Ciss
Coss
Crss
Ciss, Coss, Crss – pF
Drain-to-Source Voltage, VDS – V
IT16297


VGS -- Qg
VDS= –6V
ID= –3.5A
Gate-to-Source Voltage, VGS – V
Total Gate Charge, Qg – nC
IT16298


A S O
IDP= –14A (PW≤10μs)
ID= –3.5A
1ms
100μs
10ms
100ms
DC operation (Ta=25°C)
Operation in this area
is limited by RDS(on).
Ta=25°C
Single pulse
When mounted on ceramic substrate (900mm2×0.8mm)
Drain Current, ID – A
Drain-to-Source Voltage, VDS – V
IT16299


PD -- Ta
When mounted on ceramic substrate
(900mm2×0.8mm)
Allowable Power Dissipation, PD – W
Ambient Temperature, Ta – °C
IT16300

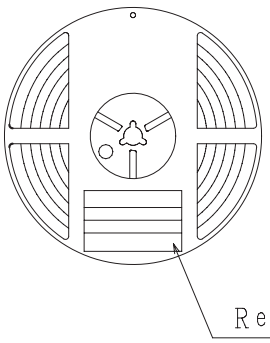
Taping Specification

MCH3383-TL-H

1. Packing Format

Package Name	Carrier Tape Type	Maximun Number of devices contained (pcs)			Packing format	
		Reel	Inner box	Outer box	Inner BOX (C-1)	Outer BOX (A-7)
MCPH3	MCPH3	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

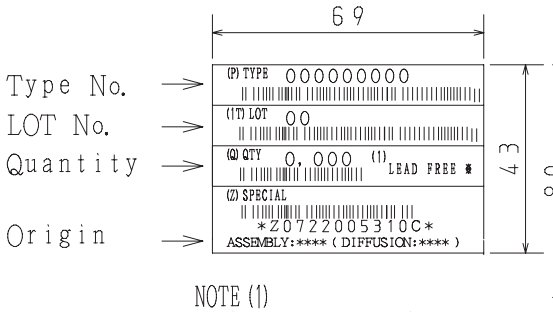
Packing method



Reel label

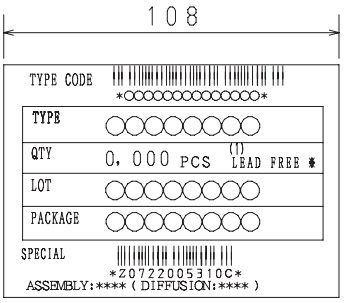
Reel label, Inner box label

(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.



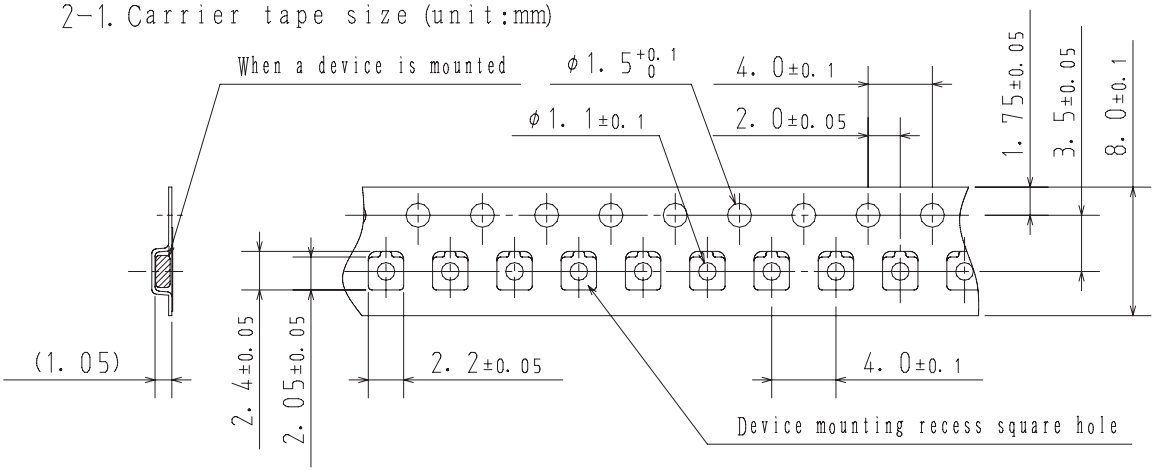
NOTE (1)

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

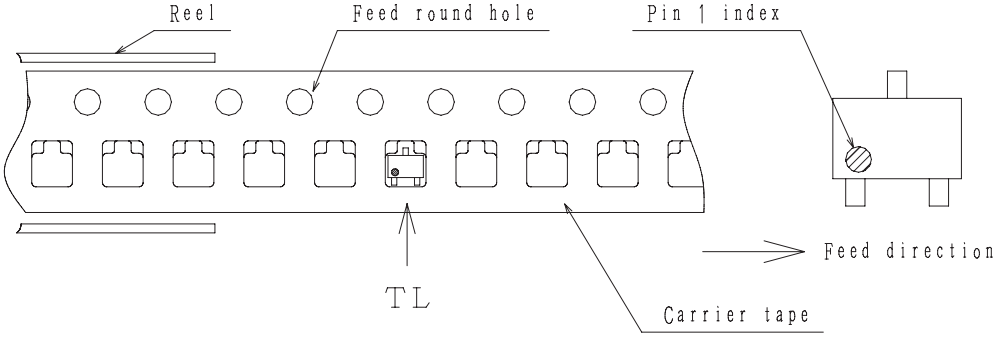
Label	JEITA Phase
LEAD FREE 3	JEITA Phase 3A
LEAD FREE 4	JEITA Phase 3

2. Taping configuration

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



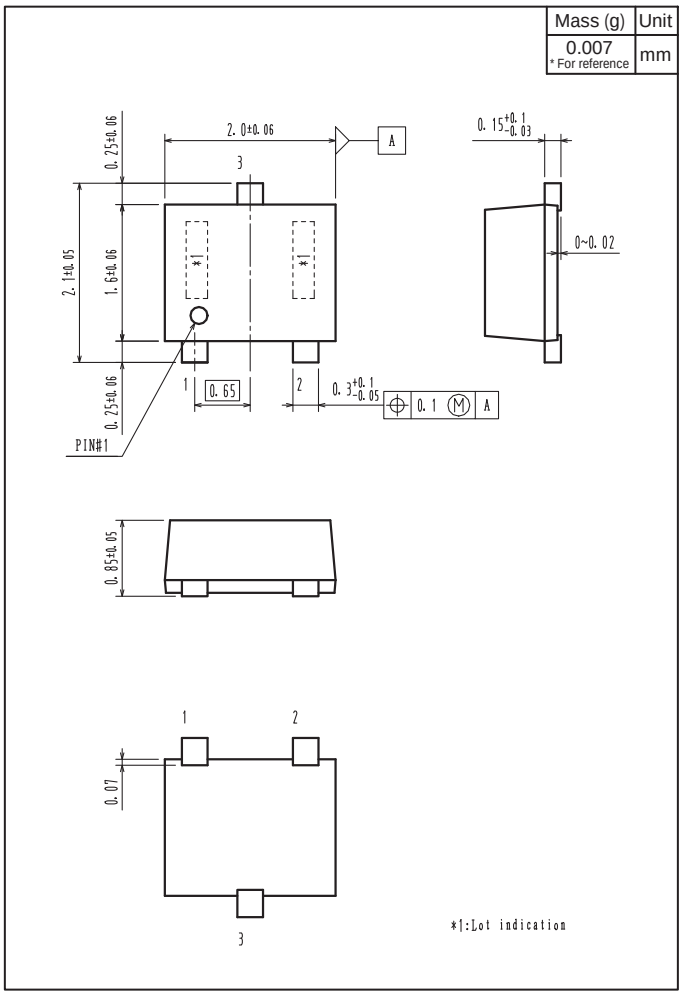
2-2. Device placement direction



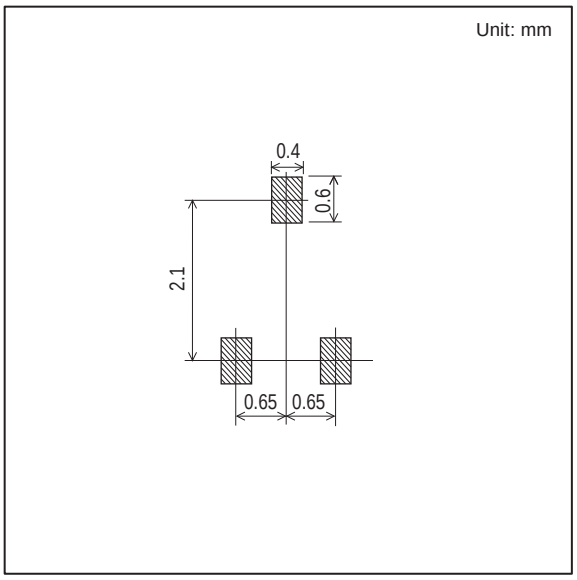
Those with pin 1 index on the feed hole side·····TL

Outline Drawing

MCH3383-TL-H



Land Pattern Example



Note on usage : Since the MCH3383 is a MOSFET product, please avoid using this device in the vicinity of highly charged objects.

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