Ordering number : EN9000A

MCH3383

P-Channel Power MOSFET
−12V, −3.5A, 69mΩ, Single MCPH3

ON Semiconductor®
http://onsemi.com

Features

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

Specifications

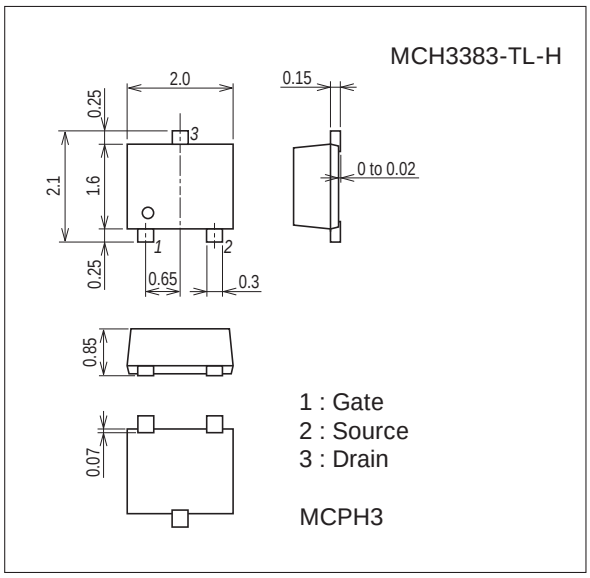
Absolute Maximum Ratings at Ta=25°C

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

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.

Package Dimensions

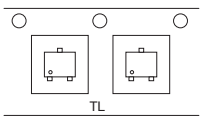
unit : mm (typ)
7019A-003



Product & Package Information

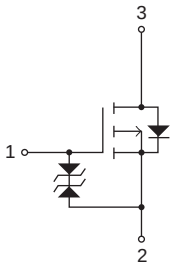
- Package : MCPH3
- JEITA, JEDEC : SC-70, SOT-323
- Minimum Packing Quantity : 3,000 pcs./reel

Packing Type : TL



Marking

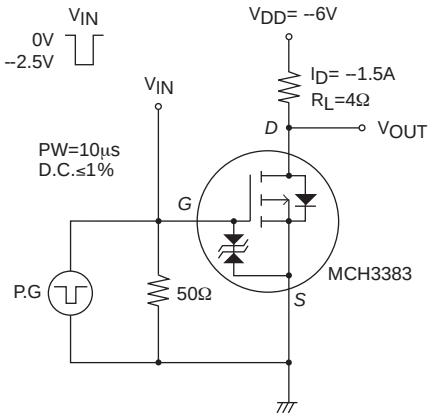
Electrical Connection



Electrical Characteristics at Ta=25°C

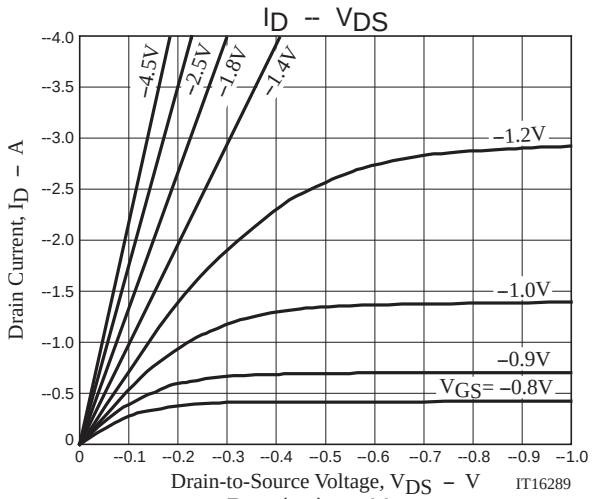
Parameter	Symbol	Conditions	Ratings			Unit
			min	typ	max	
Drain-to-Source Breakdown Voltage	$V_{(BR)DSS}$	I_D=−1mA, V_{GS}=0V	−12			V
Zero-Gate Voltage Drain Current	I_{DSS}	V_{DS}=−12V, V_{GS}=0V			−10	μA
Gate-to-Source Leakage Current	I_{GSS}	V_{GS}=±4V, V_{DS}=0V			±10	μA
Cutoff Voltage	V_{GS}(off)	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

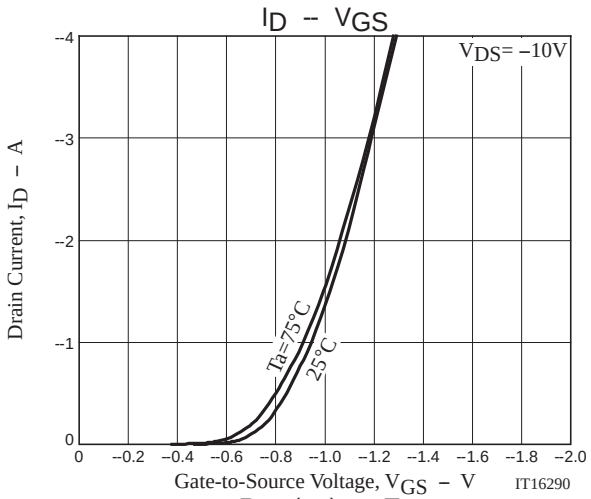
Switching Time Test Circuit

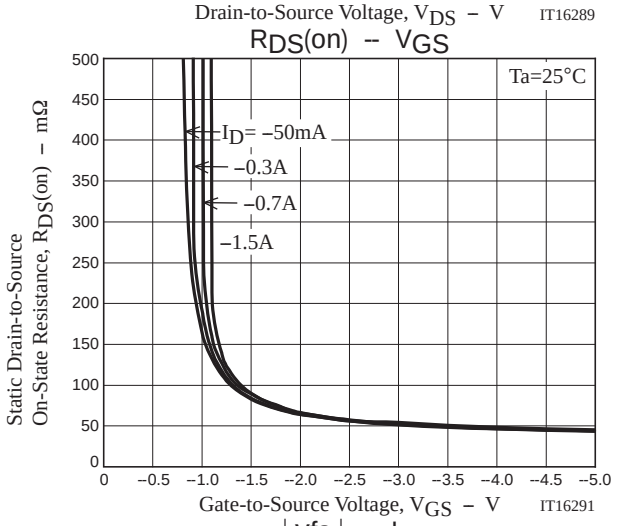


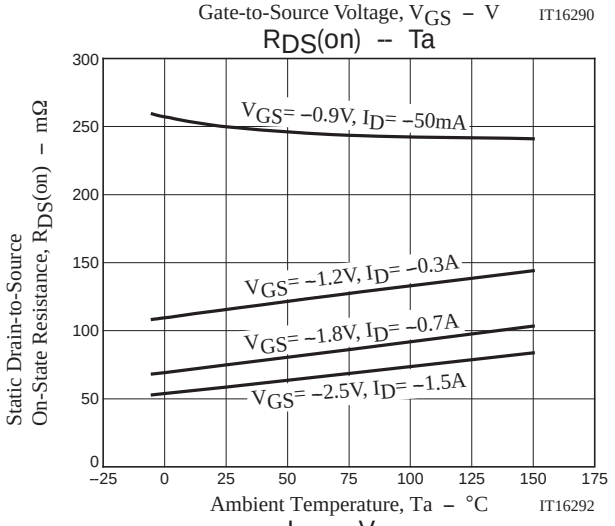
Ordering Information

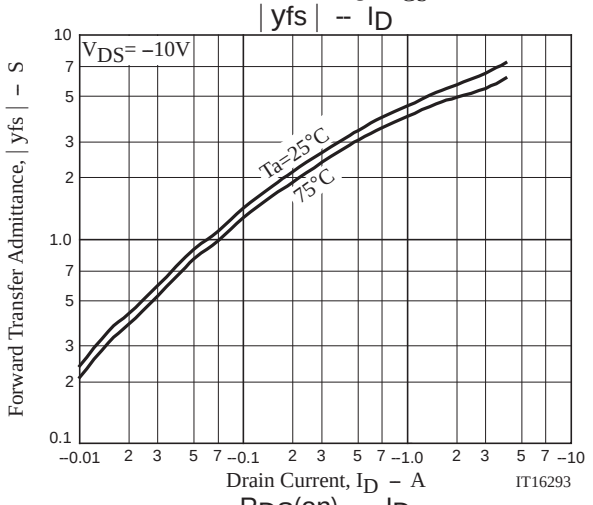
Device	Package	Shipping	memo
MCH3383-TL-H	MCPH3	3,000pcs./reel	Pb Free and Halogen Free

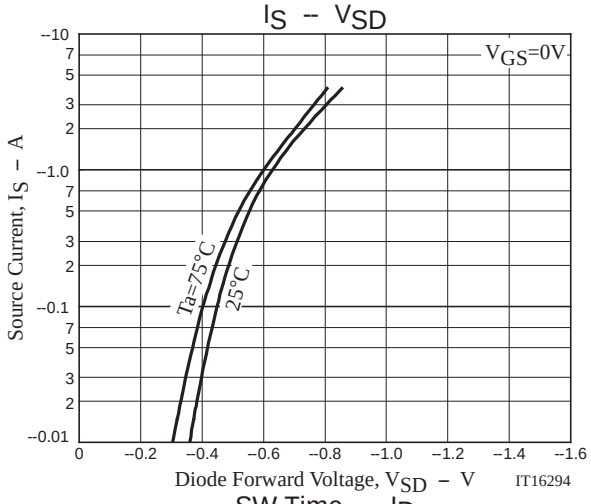

ID -- VDS
Drain Current, ID – A
Drain-to-Source Voltage, VDS – V
IT16289
–4.5V
–2.5V
–1.8V
–1.4V
–1.2V
–1.0V
–0.9V
VGS= –0.8V

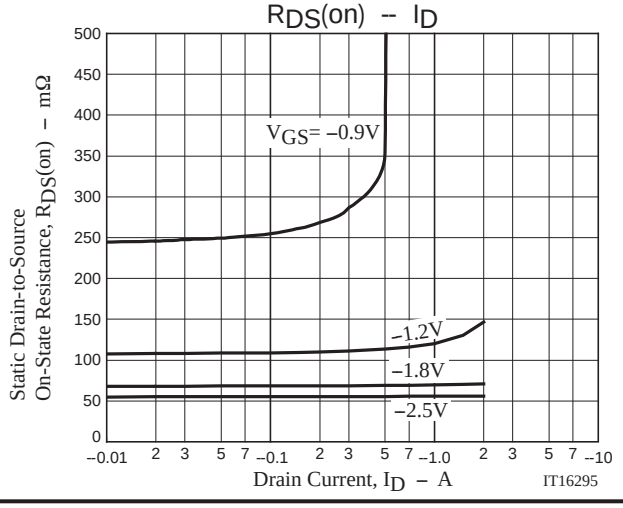

ID -- VGS
Drain Current, ID – A
Gate-to-Source Voltage, VGS – V
IT16290
VDS= –10V
Ta=75°C
25°C

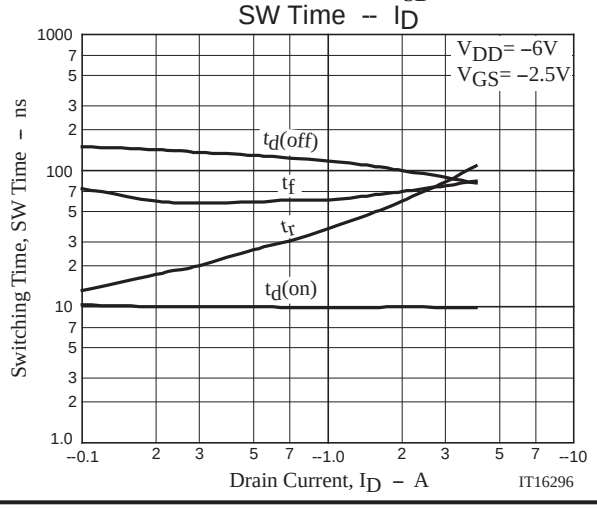

RDS(on) -- VGS
Static Drain-to-Source On-State Resistance, RDS(on) – mΩ
Gate-to-Source Voltage, VGS – V
IT16291
Ta=25°C
ID= –50mA
–0.3A
–0.7A
–1.5A

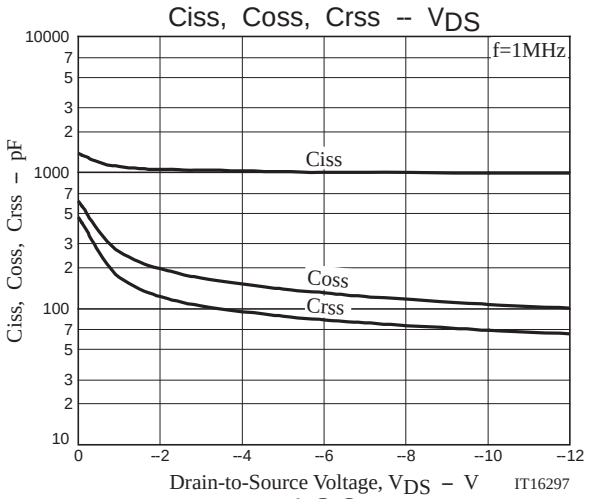

RDS(on) -- Ta
Static Drain-to-Source On-State Resistance, RDS(on) – mΩ
Ambient Temperature, Ta – °C
IT16292
VGS= –0.9V, ID= –50mA
VGS= –1.2V, ID= –0.3A
VGS= –1.8V, ID= –0.7A
VGS= –2.5V, ID= –1.5A

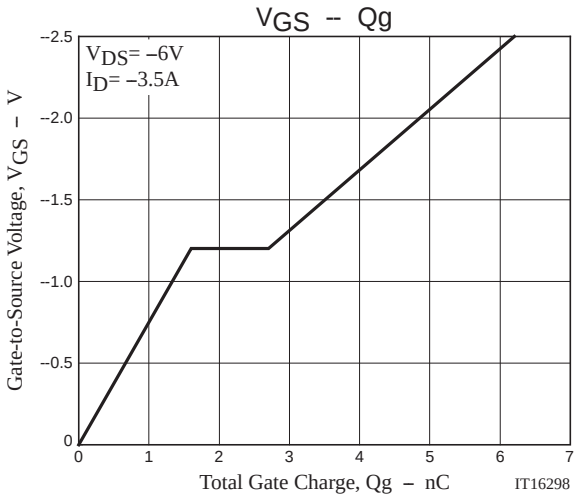

| yfs | -- ID
Forward Transfer Admittance, | yfs | – S
Drain Current, ID – A
IT16293
VDS= –10V
Ta=25°C
75°C

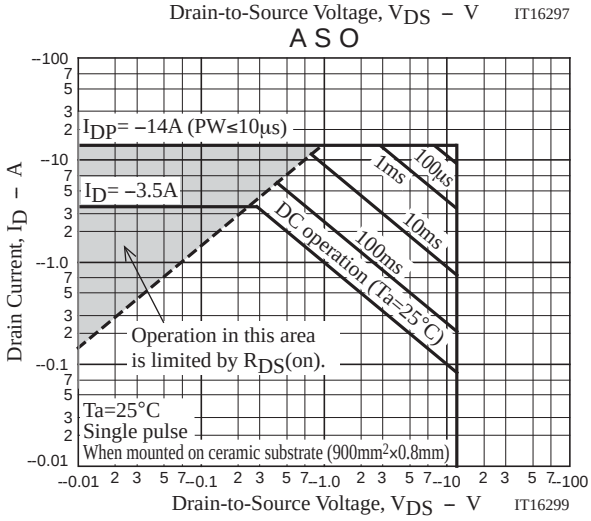

IS -- VSD
Source Current, IS – A
Diode Forward Voltage, VSD – V
IT16294
VGS=0V
Ta=75°C
25°C

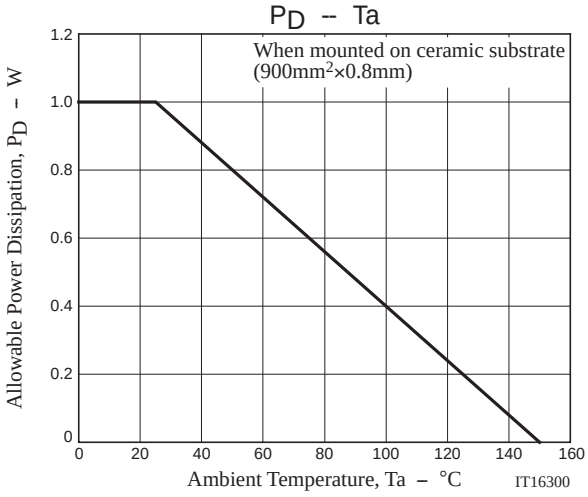

RDS(on) -- ID
Static Drain-to-Source On-State Resistance, RDS(on) – mΩ
Drain Current, ID – A
IT16295
VGS= –0.9V
–1.2V
–1.8V
–2.5V


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

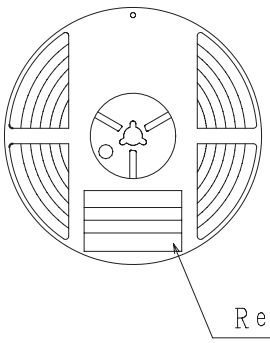
Taping Specification

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

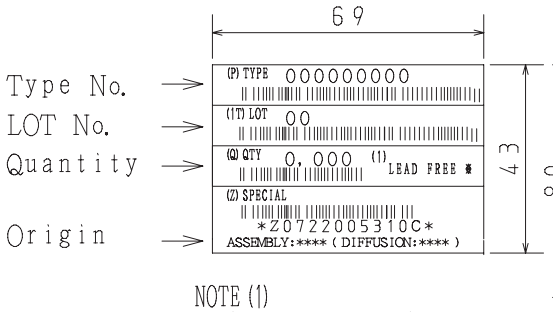
Packing method



Reel label

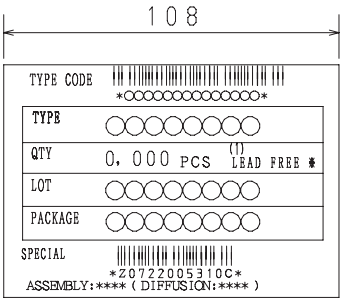
Reel label, Inner box label

(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.

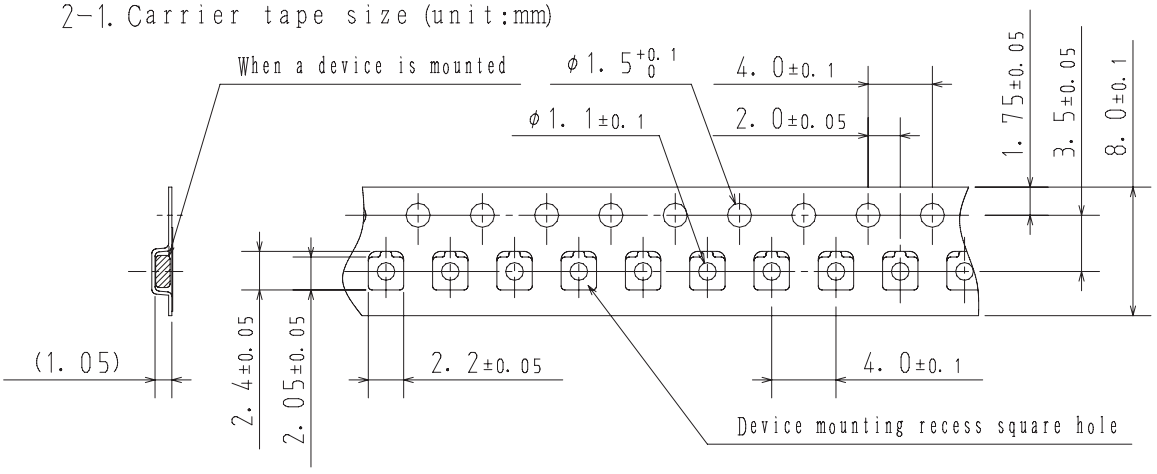


NOTE (1)
The LEAD FREE ※ description shows that the surface treatment of the terminal is lead free.

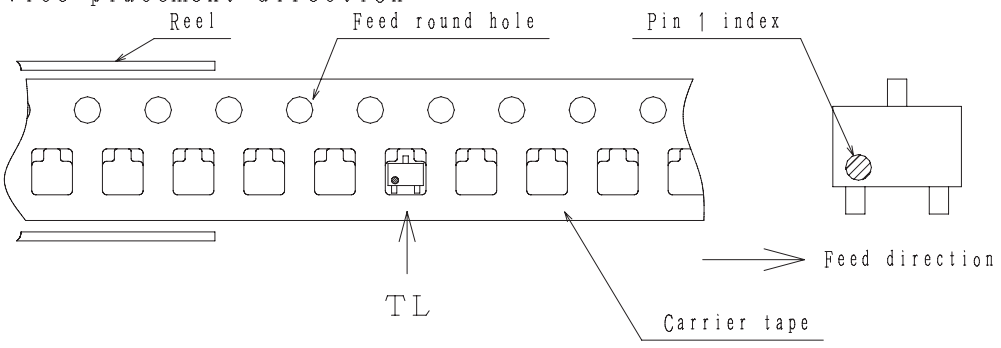
Label	JEITA Phase
LEAD FREE 3	JEITA Phase 3A
LEAD FREE 4	JEITA Phase 3

2. Taping configuration

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



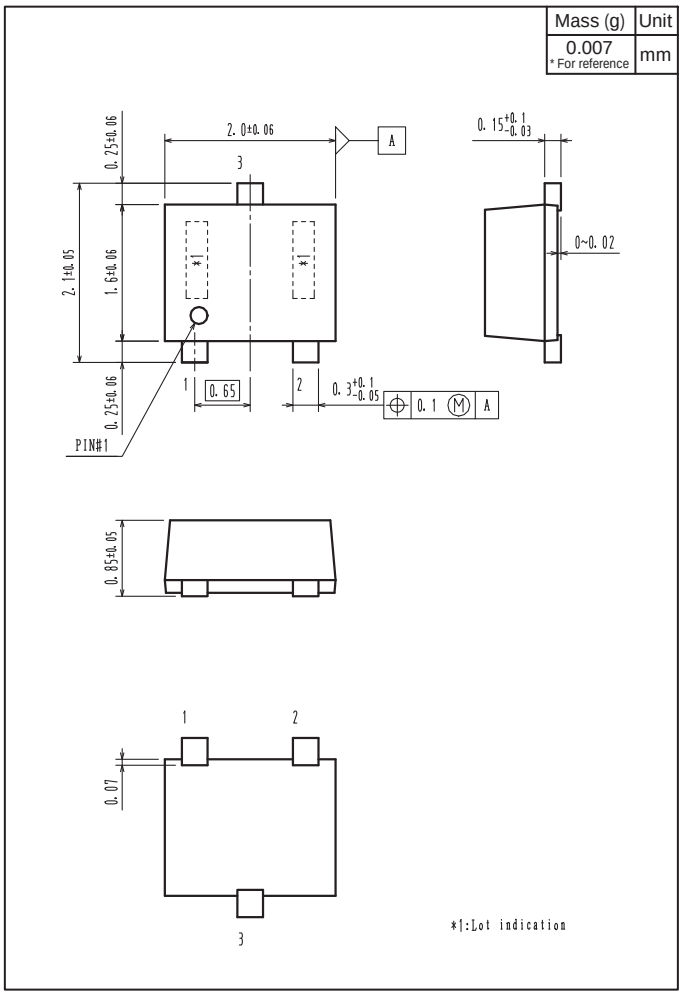
2-2. Device placement direction



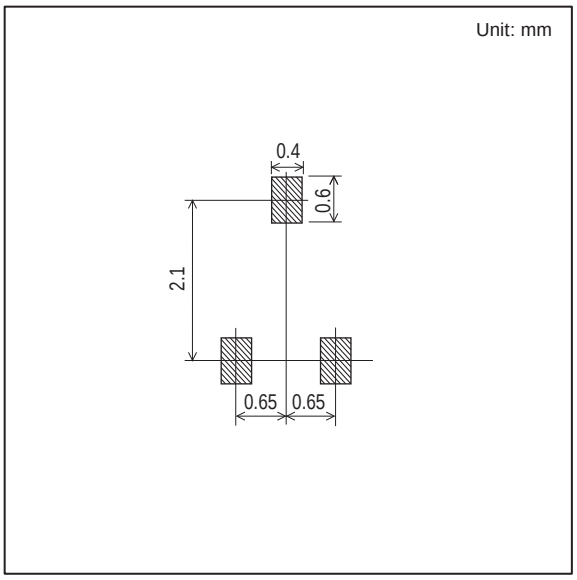
Those with pin 1 index on the feed hole side·····TL

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.