Ordering number : ENA1710B

SANYO Semiconductors

DATA SHEET

An ON Semiconductor Company

N-Channel Silicon MOSFET

ECH8657 — General-Purpose Switching Device Applications

Features

- 4V drive
- Halogen free compliance
- Protection diode in

Specifications

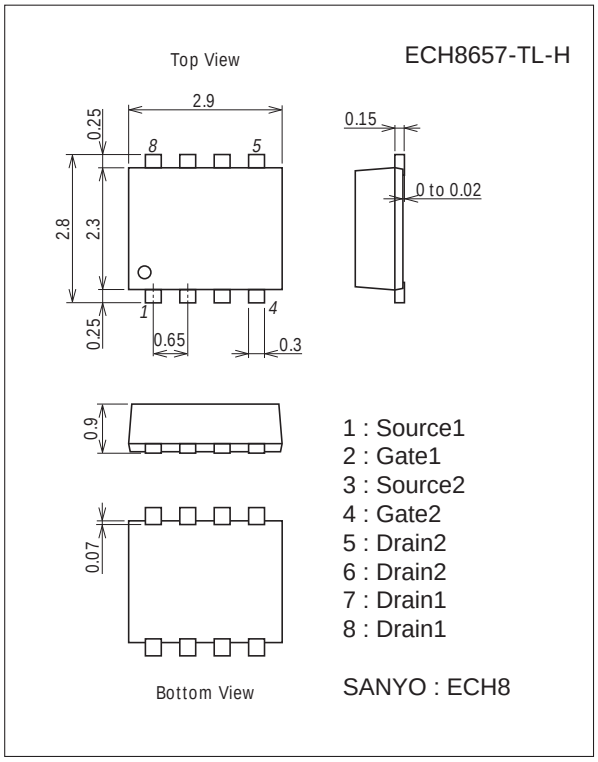
Absolute Maximum Ratings at Ta=25°C

Parameter	Symbol	Conditions	Ratings	Unit
Drain-to-Source Voltage	V_{DSS}		35	V
Gate-to-Source Voltage	V_{GSS}		±20	V
Drain Current (DC)	I_D		4.5	A
Drain Current (Pulse)	I_{DP}	PW≤10μs, duty cycle≤1%	30	A
Allowable Power Dissipation	P_D	When mounted on ceramic substrate (1200mm²×0.8mm) 1unit	1.3	W
Total Dissipation	P_T	When mounted on ceramic substrate (1200mm²×0.8mm)	1.5	W
Channel Temperature	Tch		150	°C
Storage Temperature	Tstg		−55 to +150	°C

Package Dimensions

unit : mm (typ)

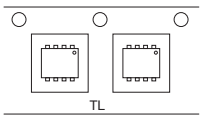
7011A-001



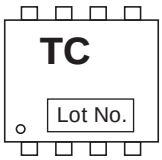
Product & Package Information

- Package : ECH8
- JEITA, JEDEC : -
- Minimum Packing Quantity : 3,000 pcs./reel

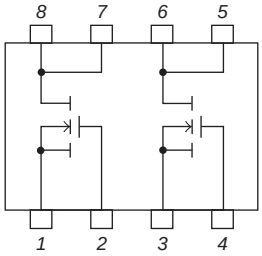
Packing Type : TL



Marking



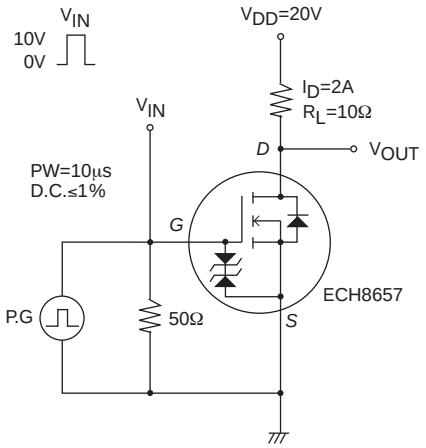
Electrical Connection



Electrical Characteristics at Ta=25°C

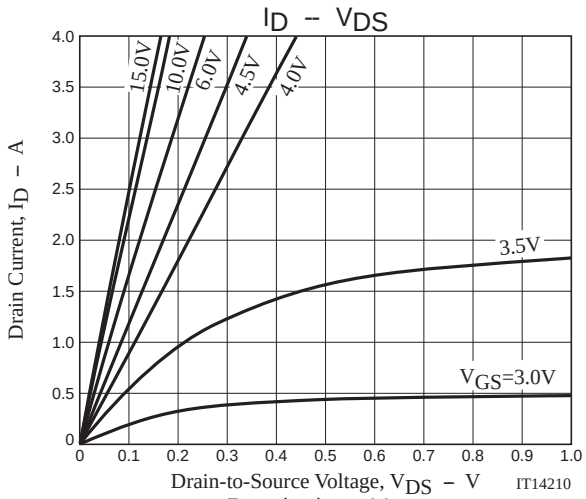
Parameter	Symbol	Conditions	Ratings			Unit
			min	typ	max	
Drain-to-Source Breakdown Voltage	$V_{(BR)DSS}$	I_D=1mA, V_{GS}=0V	35			V
Zero-Gate Voltage Drain Current	I_{DSS}	V_{DS}=35V, V_{GS}=0V			1	μA
Gate-to-Source Leakage Current	I_{GSS}	V_{GS}=±16V, V_{DS}=0V			±10	μA
Cutoff Voltage	V_{GS}(off)	V_{DS}=10V, I_D=1mA	1.2		2.6	V
Forward Transfer Admittance	| yfs |	V_{DS}=10V, I_D=2A		1.66		S
Static Drain-to-Source On-State Resistance	R_{DS}(on)1	I_D=2A, V_{GS}=10V		45	59	mΩ
	R_{DS}(on)2	I_D=1A, V_{GS}=4.5V		85	119	mΩ
	R_{DS}(on)3	I_D=1A, V_{GS}=4V		110	155	mΩ
Input Capacitance	Ciss	V_{DS}=20V, f=1MHz		230		pF
Output Capacitance	Coss			37		pF
Reverse Transfer Capacitance	Crss			25		pF
Turn-ON Delay Time	$t_{d(on)}$	See specified Test Circuit.		6		ns
Rise Time	t_r			11		ns
Turn-OFF Delay Time	$t_{d(off)}$			17		ns
Fall Time	t_f			9		ns
Total Gate Charge	Qg	V_{DS}=20V, V_{GS}=10V, I_D=4.5A		4.6		nC
Gate-to-Source Charge	Qgs			1.0		nC
Gate-to-Drain “Miller” Charge	Qgd			1.0		nC
Diode Forward Voltage	V_{SD}	I_S=4.5A, V_{GS}=0V		0.85	1.2	V

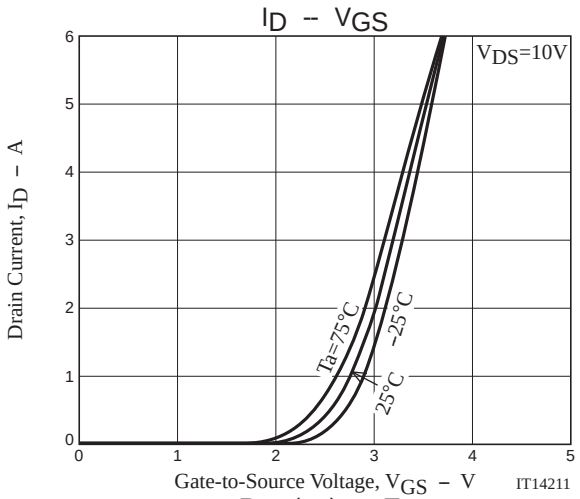
Switching Time Test Circuit

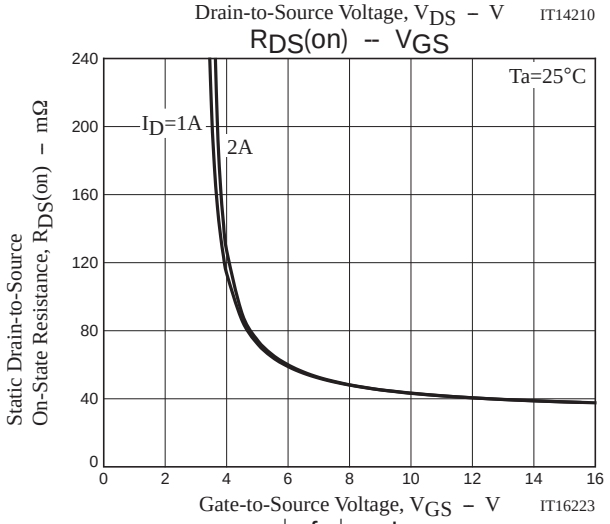


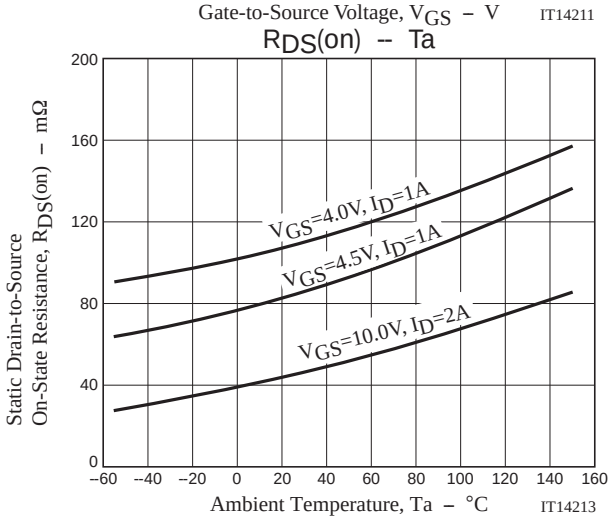
Ordering Information

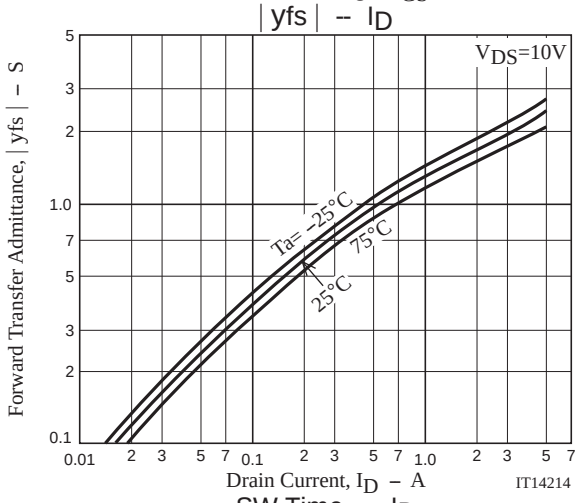
Device	Package	Shipping	memo
ECH8657-TL-H	ECH8	3,000pcs./reel	Pb Free and Halogen Free

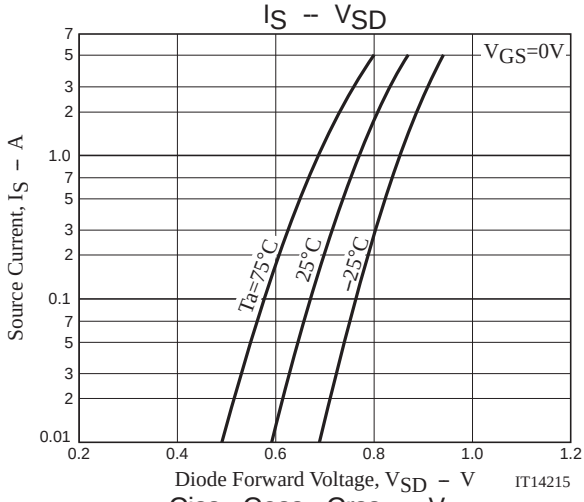

ID -- VDS
Drain Current, ID – A
15.0V
10.0V
6.0V
4.5V
4.0V
3.5V
VGS=3.0V
Drain-to-Source Voltage, VDS – V
IT14210

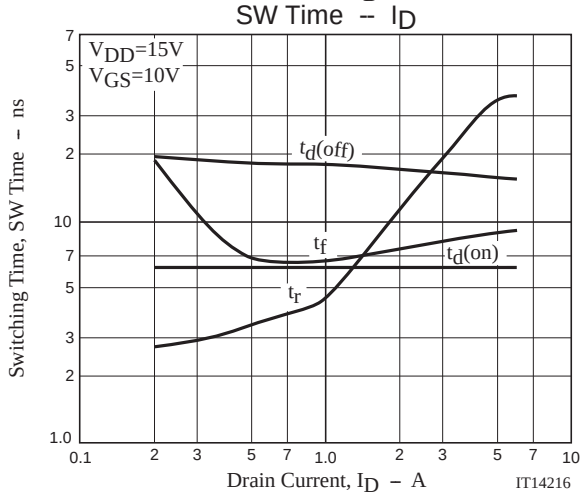

ID -- VGS
VDS=10V
Drain Current, ID – A
Ta=75°C
25°C
–25°C
Gate-to-Source Voltage, VGS – V
IT14211

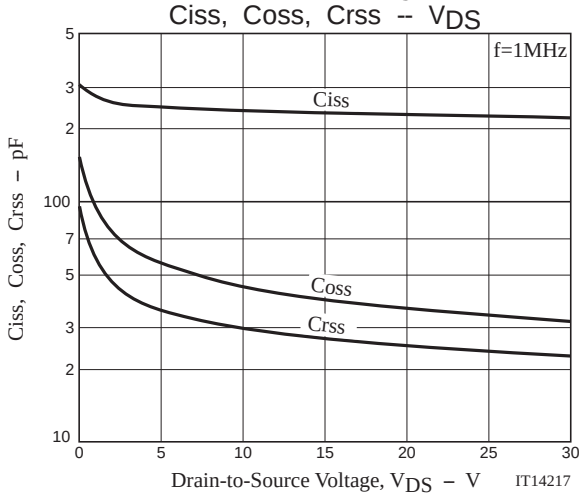

RDS(on) -- VGS
Ta=25°C
ID=1A
2A
Static Drain-to-Source
On-State Resistance, RDS(on) – mΩ
Gate-to-Source Voltage, VGS – V
IT16223

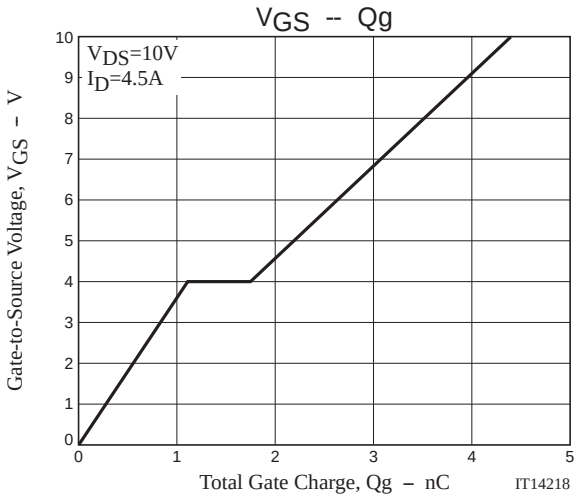

RDS(on) -- Ta
VGS=4.0V, ID=1A
VGS=4.5V, ID=1A
VGS=10.0V, ID=2A
Static Drain-to-Source
On-State Resistance, RDS(on) – mΩ
Ambient Temperature, Ta – °C
IT14213

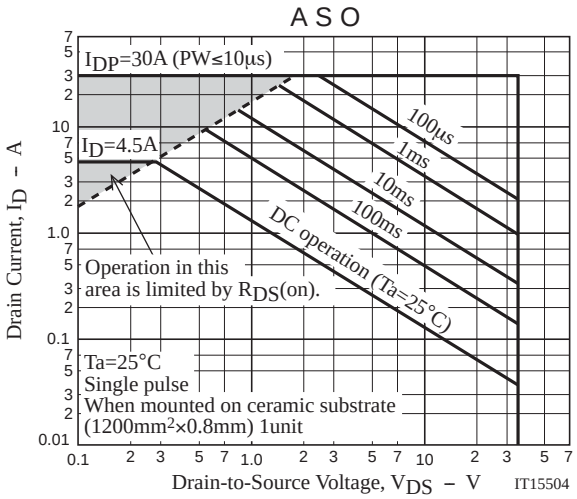

| yfs | -- ID
VDS=10V
Ta= –25°C
75°C
25°C
Forward Transfer Admittance, | yfs | – S
Drain Current, ID – A
IT14214

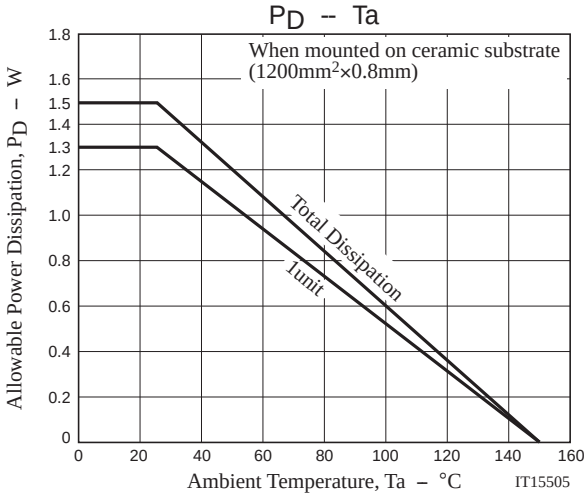

IS -- VSD
VGS=0V
Ta=75°C
25°C
–25°C
Source Current, IS – A
Diode Forward Voltage, VSD – V
IT14215


SW Time -- ID
VDD=15V
VGS=10V
td(off)
tf
td(on)
tr
Switching Time, SW Time – ns
Drain Current, ID – A
IT14216


Ciss, Coss, Crss -- VDS
f=1MHz
Ciss
Coss
Crss
Ciss, Coss, Crss – pF
Drain-to-Source Voltage, VDS – V
IT14217


VGS -- Qg
VDS=10V
ID=4.5A
Gate-to-Source Voltage, VGS – V
Total Gate Charge, Qg – nC
IT14218


A S O
IDP=30A (PW≤10μs)
ID=4.5A
100μs
1ms
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
(1200mm2×0.8mm) 1unit
Drain Current, ID – A
Drain-to-Source Voltage, VDS – V
IT15504


PD -- Ta
When mounted on ceramic substrate
(1200mm2×0.8mm)
Total Dissipation
1unit
Allowable Power Dissipation, PD – W
Ambient Temperature, Ta – °C
IT15505

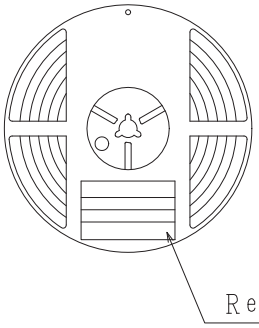
Embossed Taping Specification

ECH8657-TL-H

1. Packing Format

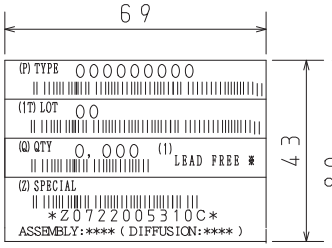
Package Name	Carrier Tape Type	Maximum Number of devices contained (pcs)			Packing format	
		Reel	Inner box	Outer box	Inner BOX (C-1)	Outer BOX (A-7)
ECH8	CPH6	3,000	15,000	90,000	5 reels contained Dimensions:mm(external) 183×72×185	6 inner boxes contained Dimensions:mm(external) 440×195×210

Packing method



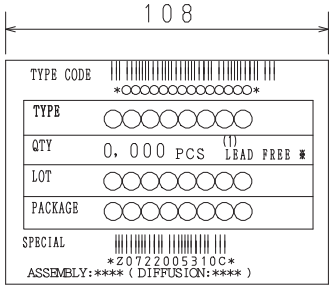
Reel label, Inner box label

(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.



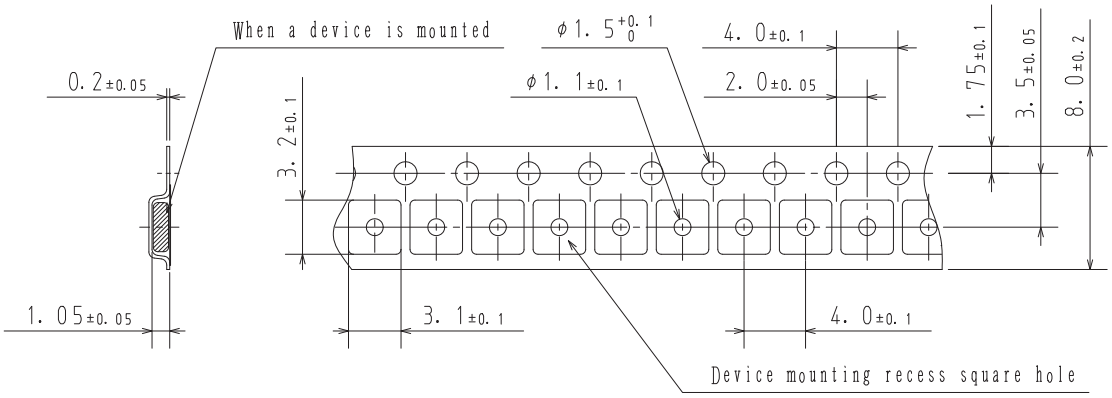
NOTE (1)

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

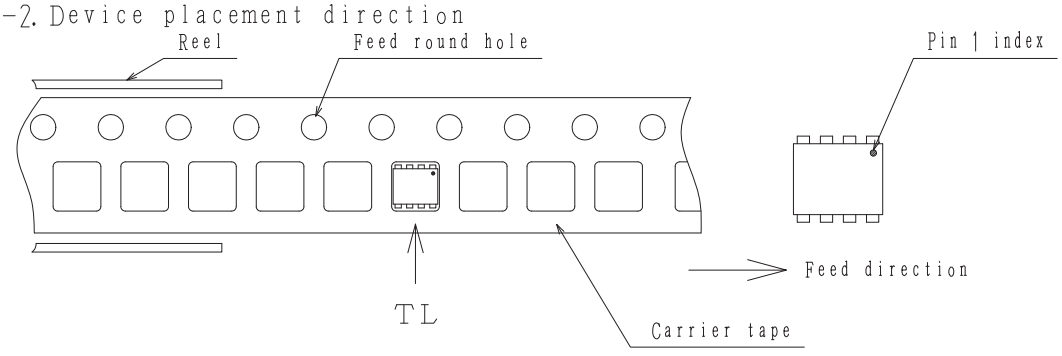
Label	JEITA Phase
LEAD FREE 3	JEITA Phase 3A
LEAD FREE 4	JEITA Phase 3

2. Taping configuration

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



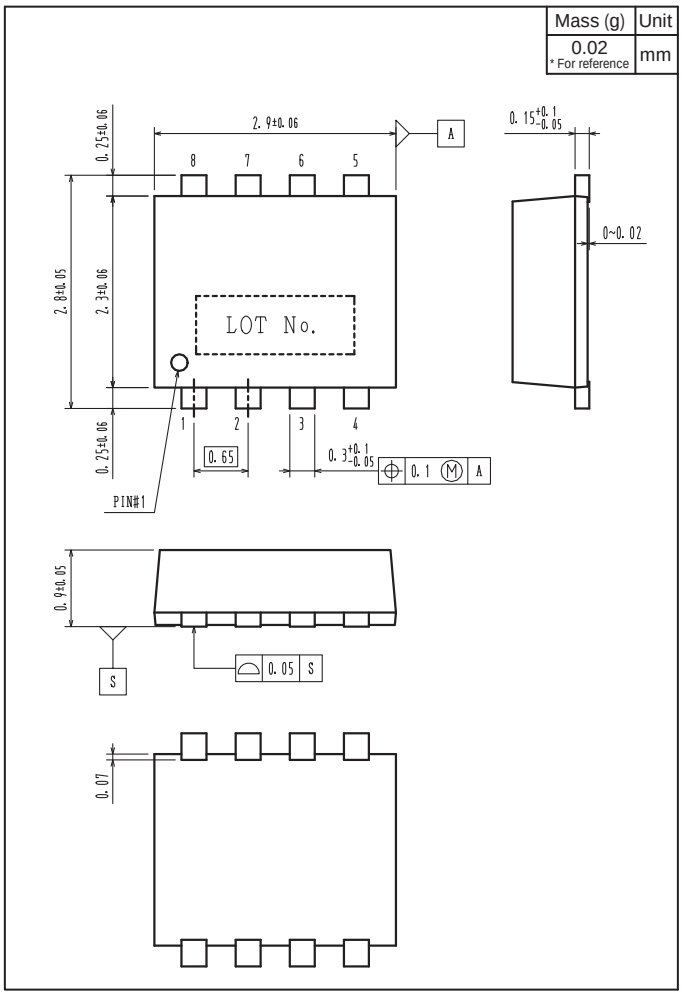
2-2. Device placement direction



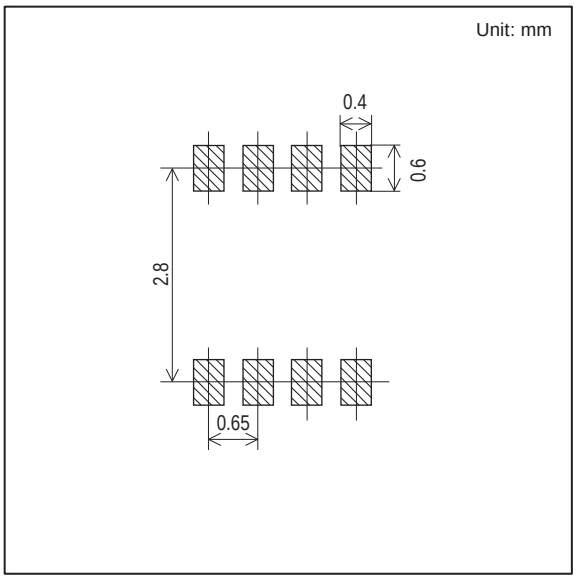
Those with pin 1 index on the feed hole side·····TL

Outline Drawing

ECH8657-TL-H



Land Pattern Example



Note on usage : Since the ECH8657 is a MOSFET product, please avoid using this device in the vicinity of highly charged objects.

This catalog provides information as of June, 2012. Specifications and information herein are subject to change without notice.