Ordering number : ENA1401A

SANYO Semiconductors

DATA SHEET

An ON Semiconductor Company

CPH5871

MOSFET : N-Channel Silicon MOSFET
SBD : Schottky Barrier Diode

General-Purpose Switching Device Applications

Features

- Composite type with a N-channel sillicon MOSFET and a schottky barrier diode contained in one package facilitating high-density mounting
- Halogen free compliance
- [MOSFET] · Ultrahigh-speed switching
- [SBD] · Short reverse recovery time
- Protection diode in
- 1.8V drive
- Low forward voltage

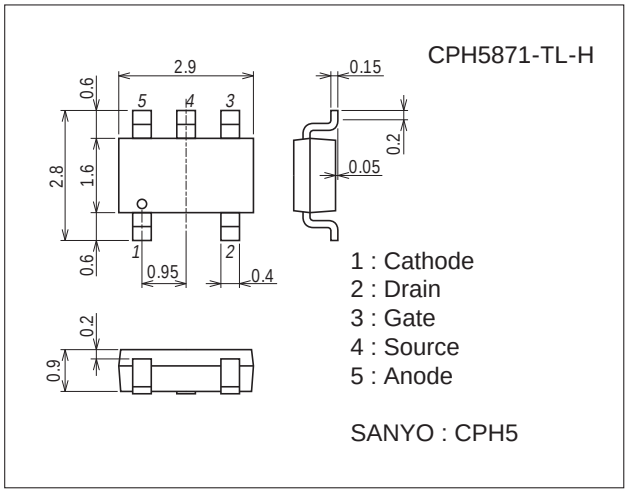
Specifications

Absolute Maximum Ratings at Ta=25°C

Parameter	Symbol	Conditions	Ratings	Unit
[MOSFET]				
Drain-to-Source Voltage	V_{DSS}		30	V
Gate-to-Source Voltage	V_{GSS}		±12	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 (600mm^2×0.8mm) 1unit	0.9	W
Channel Temperature	Tch		150	°C
Storage Temperature	Tstg		−55 to +125	°C
[SBD]				
Repetitive Peak Reverse Voltage	V_{RRM}		30	V
Nonrepetitive Peak Reverse Surge Voltage	V_{RSM}		35	V
Average Output Current	I_O		1	A
Surge Forward Current	I_{FSM}	50Hz sine wave, 1 cycle	10	A
Junction Temperature	Tj		−55 to +125	°C
Storage Temperature	Tstg		−55 to +125	°C

Package Dimensions

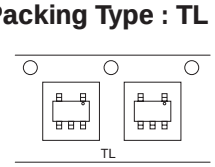
unit : mm (typ)
7017A-005



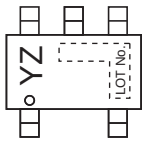
Product & Package Information

- Package : CPH5
- JEITA, JEDEC : SC-74A, SOT-25
- Minimum Packing Quantity : 3,000 pcs./reel

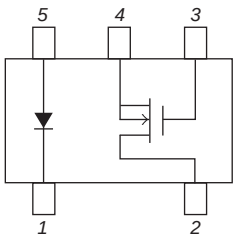
Packing Type : TL



Marking



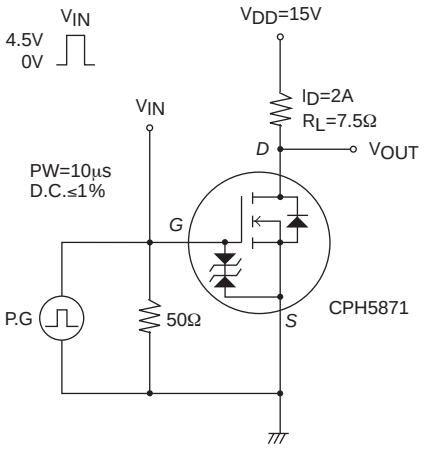
Electrical Connection



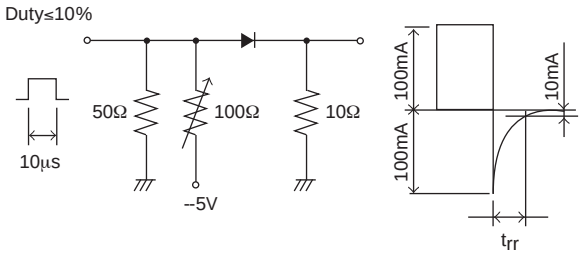
Electrical Characteristics at Ta=25°C

Parameter	Symbol	Conditions	Ratings			Unit
			min	typ	max	
[MOSFET]						
Drain-to-Source Breakdown Voltage	$V_{(BR)DSS}$	I_D=1mA, V_{GS}=0V	30			V
Zero-Gate Voltage Drain Current	I_{DSS}	V_{DS}=30V, V_{GS}=0V			1	μA
Gate-to-Source Leakage Current	I_{GSS}	V_{GS}=±8V, V_{DS}=0V			±10	μA
Cutoff Voltage	V_{GS}(off)	V_{DS}=10V, I_D=1mA	0.4		1.3	V
Forward Transfer Admittance	| yfs |	V_{DS}=10V, I_D=2A	2.0	3.4		S
Static Drain-to-Source On-State Resistance	R_{DS}(on)1	I_D=2A, V_{GS}=4.5V		40	52	mΩ
	R_{DS}(on)2	I_D=1A, V_{GS}=2.5V		53	74	mΩ
	R_{DS}(on)3	I_D=0.5A, V_{GS}=1.8V		82	132	mΩ
Input Capacitance	Ciss	V_{DS}=10V, f=1MHz		430		pF
Output Capacitance	Coss			59		pF
Reverse Transfer Capacitance	Crss			38		pF
Turn-ON Delay Time	t_d(on)	See specified Test Circuit.		10		ns
Rise Time	t_r			41		ns
Turn-OFF Delay Time	t_d(off)			36		ns
Fall Time	t_f			37		ns
Total Gate Charge	Qg	V_{DS}=15V, V_{GS}=4.5V, I_D=3.5A		4.7		nC
Gate-to-Source Charge	Qgs			0.8		nC
Gate-to-Drain “Miller” Charge	Qgd			1.1		nC
Diode Forward Voltage	V_{SD}	I_S=3.5A, V_{GS}=0V		0.8	1.2	V
[SBD]						
Reverse Voltage	V_R	I_R=0.5mA	30			V
Forward Voltage	V_F1	I_F=0.7A		0.45	0.5	V
	V_F2	I_F=1A		0.48	0.53	V
Reverse Current	I_R	V_R=16V			15	μA
Interterminal Capacitance	C	V_R=10V, f=1MHz, 1 cycle		27		pF
Reverse Recovery Time	t_{rr}	I_F=I_R=100mA, See specified Test Circuit.			10	ns

Switching Time Test Circuit
(MOSFET)

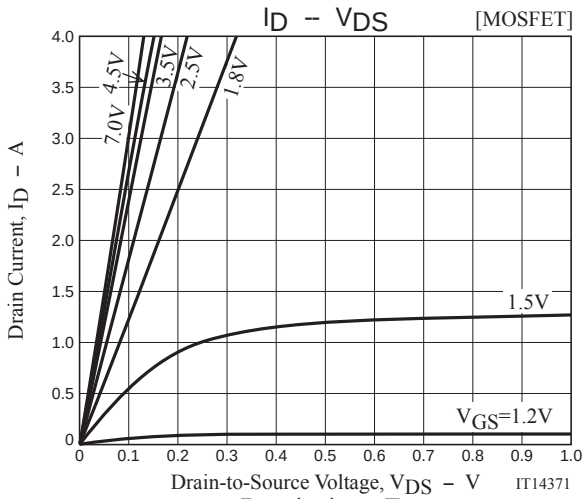


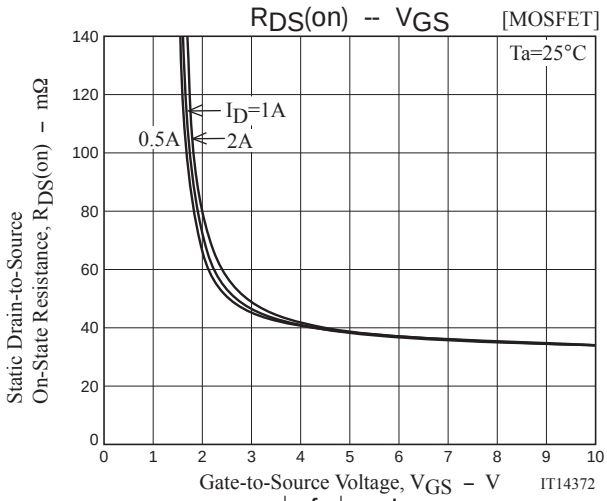
t_{rr} Test Circuit
(SBD)

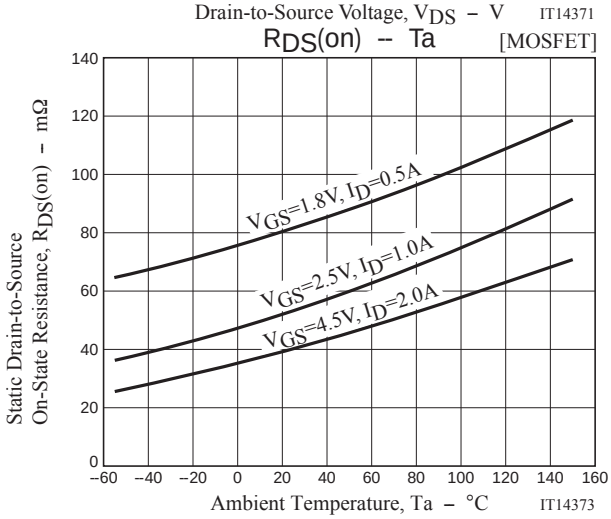


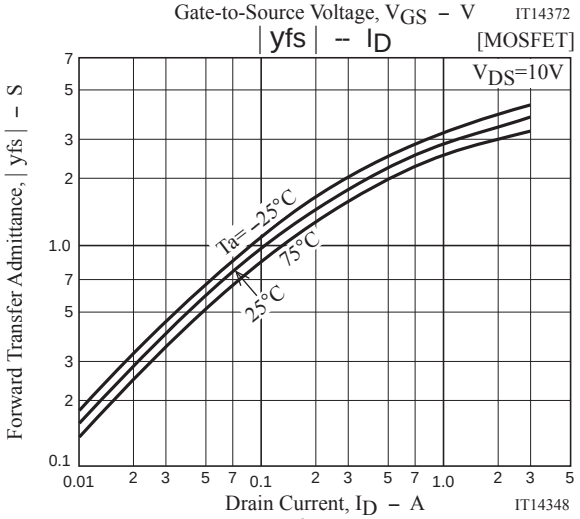
Ordering Information

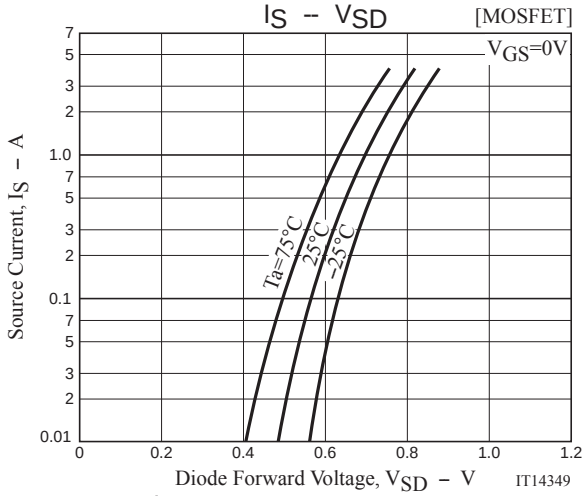
Device	Package	Shipping	memo
CPH5871-TL-H	CPH5	3,000pcs./reel	Pb Free and Halogen Free

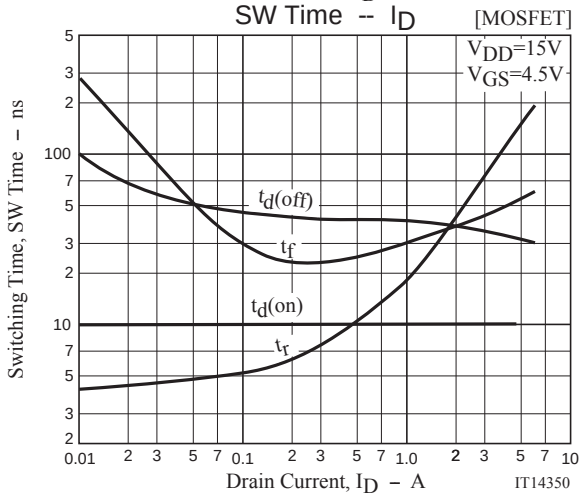

ID – VDS [MOSFET]
Drain Current, ID – A
Drain-to-Source Voltage, VDS – V
IT14371
7.0V
4.5V
3.5V
2.5V
1.8V
1.5V
VGS=1.2V

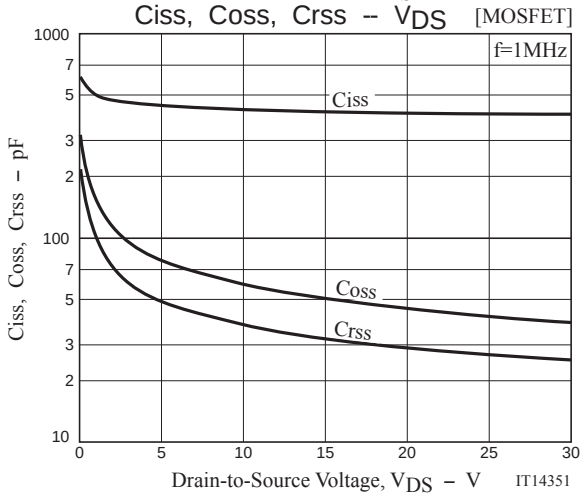

RDS(on) -- VGS [MOSFET]
Ta=25°C
Static Drain-to-Source On-State Resistance, RDS(on) – mΩ
Gate-to-Source Voltage, VGS – V
IT14372
ID=1A
0.5A
2A

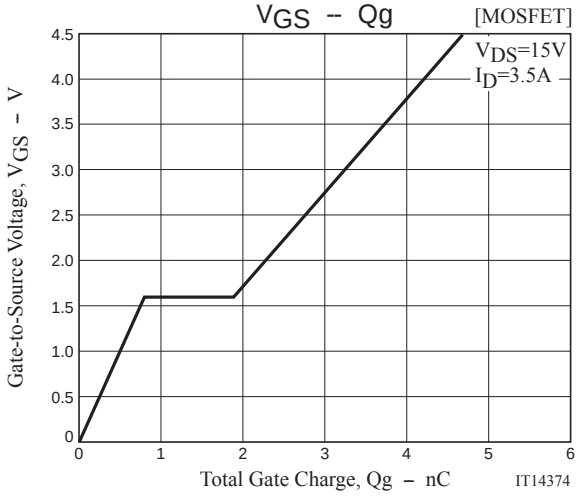

RDS(on) -- Ta [MOSFET]
Static Drain-to-Source On-State Resistance, RDS(on) – mΩ
Ambient Temperature, Ta – °C
IT14373
VGS=1.8V, ID=0.5A
VGS=2.5V, ID=1.0A
VGS=4.5V, ID=2.0A

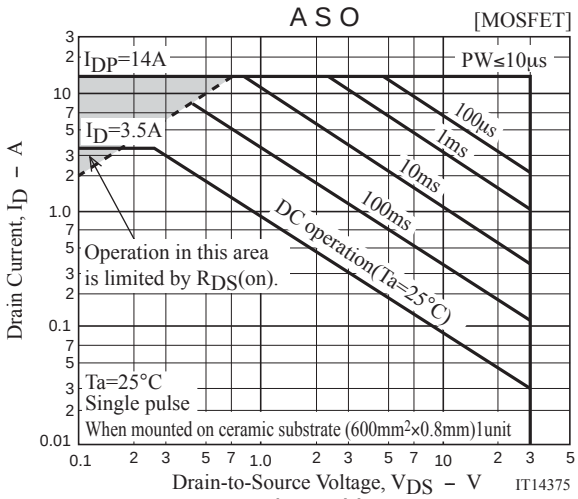

| yfs | -- ID [MOSFET]
VDS=10V
Forward Transfer Admittance, | yfs | – S
Drain Current, ID – A
IT14348
Ta= –25°C
75°C
25°C

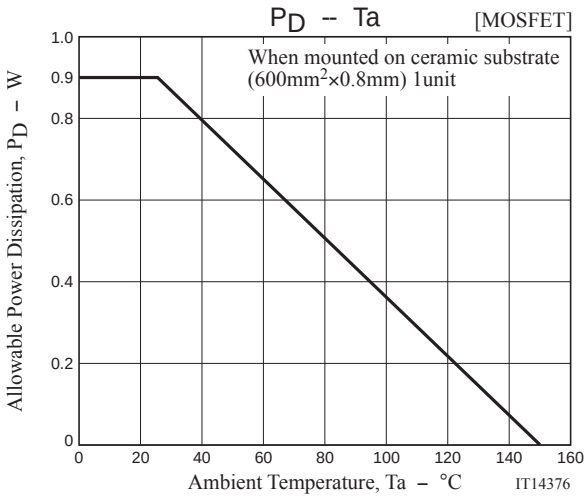

IS -- VSD [MOSFET]
VGS=0V
Source Current, IS – A
Diode Forward Voltage, VSD – V
IT14349
Ta=75°C
25°C
–25°C

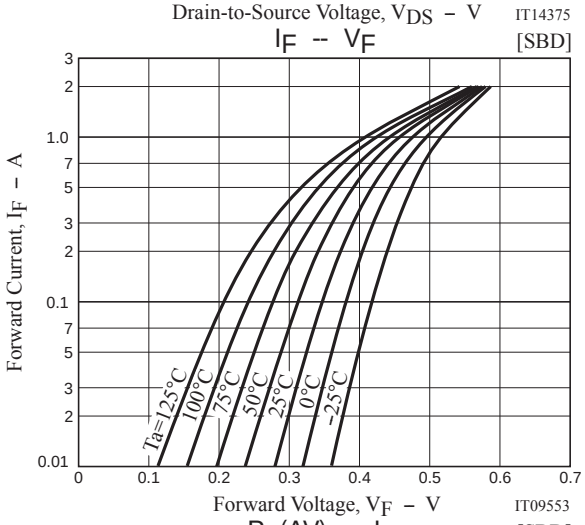

SW Time -- ID [MOSFET]
VDD=15V
VGS=4.5V
Switching Time, SW Time – ns
Drain Current, ID – A
IT14350
td(off)
tf
td(on)
tr

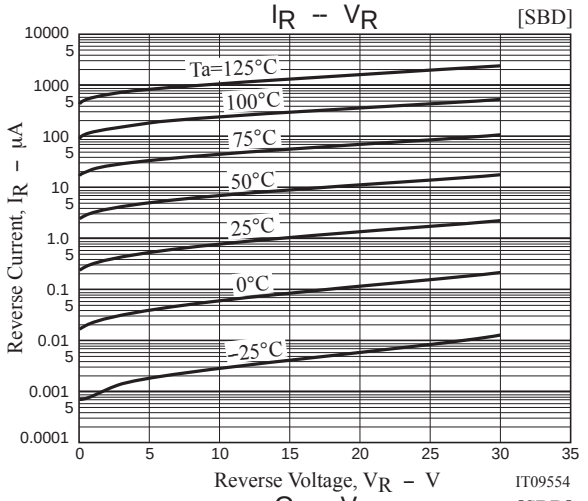

Ciss, Coss, Crss -- VDS [MOSFET]
f=1MHz
Ciss, Coss, Crss – pF
Drain-to-Source Voltage, VDS – V
IT14351
Ciss
Coss
Crss

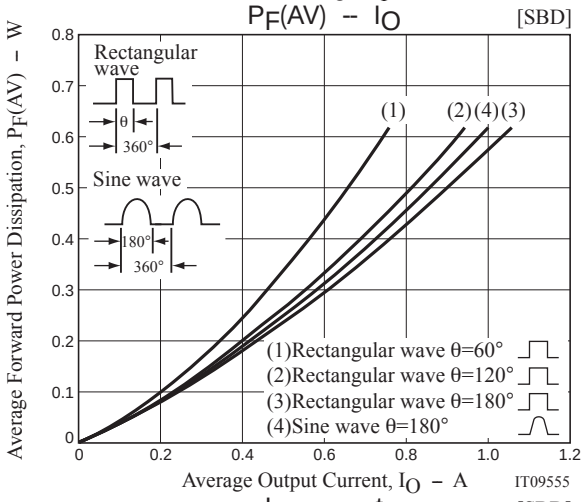

VGS -- Qg [MOSFET]
VDS=15V
ID=3.5A
Gate-to-Source Voltage, VGS – V
Total Gate Charge, Qg – nC
IT14374

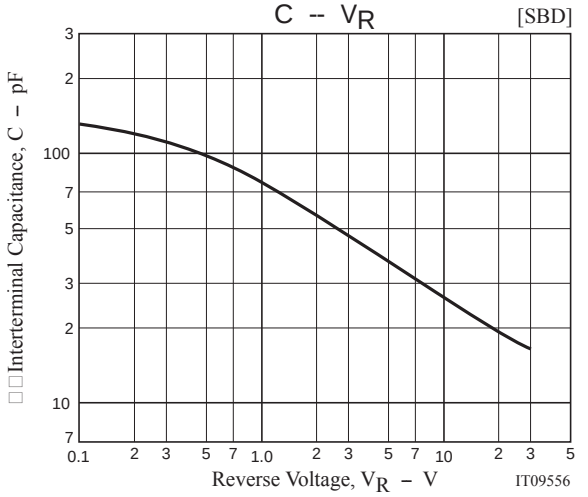

A S O
[MOSFET]
IDP=14A
PW≤10μs
ID=3.5A
100μs
1ms
10ms
100ms
DC operation(Ta=25°C)
Operation in this area
is limited by RDS(on).
Ta=25°C
Single pulse
When mounted on ceramic substrate (600mm2×0.8mm)1unit
Drain Current, ID – A
Drain-to-Source Voltage, VDS – V
IT14375

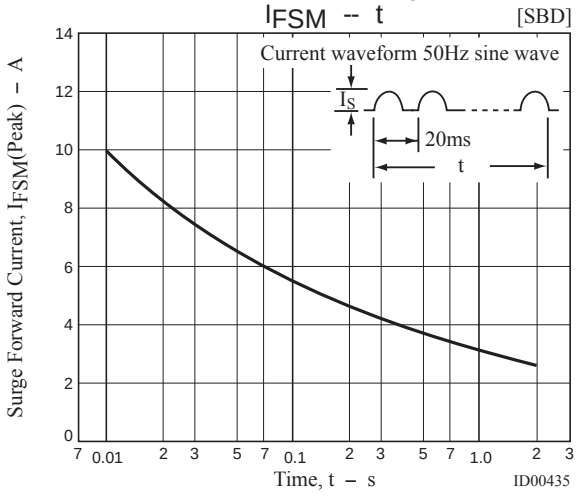

PD -- Ta
[MOSFET]
When mounted on ceramic substrate
(600mm2×0.8mm) 1unit
Allowable Power Dissipation, PD – W
Ambient Temperature, Ta – °C
IT14376


IF -- VF
[SBD]
Ta=125°C
100°C
75°C
50°C
25°C
0°C
-25°C
Forward Current, IF – A
Forward Voltage, VF – V
IT09553


IR -- VR
[SBD]
Ta=125°C
100°C
75°C
50°C
25°C
0°C
–25°C
Reverse Current, IR – μA
Reverse Voltage, VR – V
IT09554


PF(AV) -- IO
[SBD]
Rectangular
wave
θ
360°
Sine wave
180°
360°
(1)
(2)(4)(3)
(1)Rectangular wave θ=60°
(2)Rectangular wave θ=120°
(3)Rectangular wave θ=180°
(4)Sine wave θ=180°
Average Forward Power Dissipation, PF(AV) – W
Average Output Current, IO – A
IT09555


C -- VR
[SBD]
Interterminal Capacitance, C – pF
Reverse Voltage, VR – V
IT09556


IFSM -- t
[SBD]
Current waveform 50Hz sine wave
IS
20ms
t
Surge Forward Current, IFSM(Peak) – A
Time, t – s
ID00435

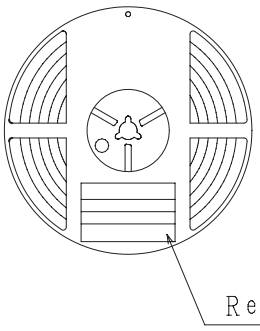
Embossed Taping Specification

CPH5871-TL-H

1. Packing Format

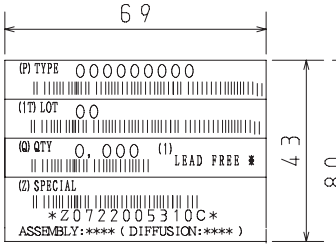
Package Name	Carrier Tape Type	Maximum Number of devices contained (pcs)			Packing format	
		Reel	Inner box	Outer box	Inner BOX (C-1)	Outer BOX (A-7)
CPH5	CPH6	3,000	15,000	90,000	5 reels contained Dimensions:mm(external) 183×72×185	6 inner boxes contained Dimensions:mm(external) 440×195×210

Packing method



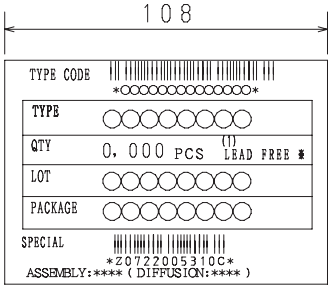
Reel label, Inner box label

(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.



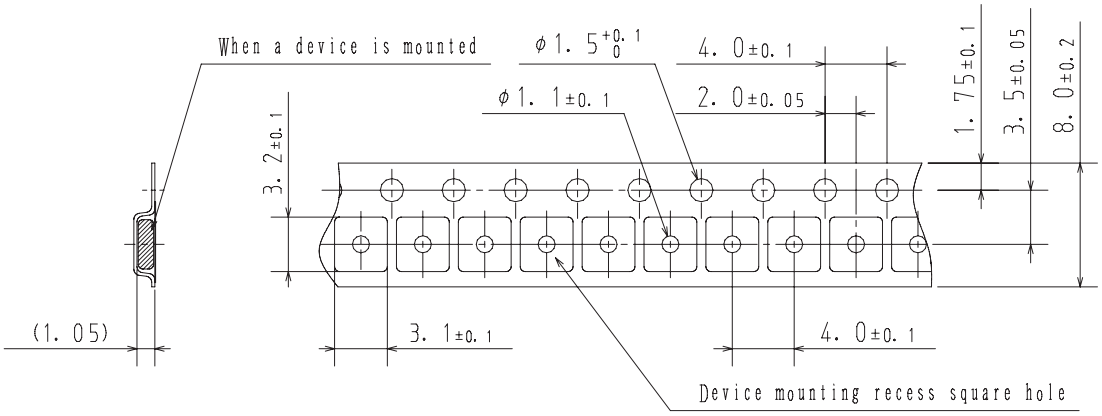
NOTE (1)

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

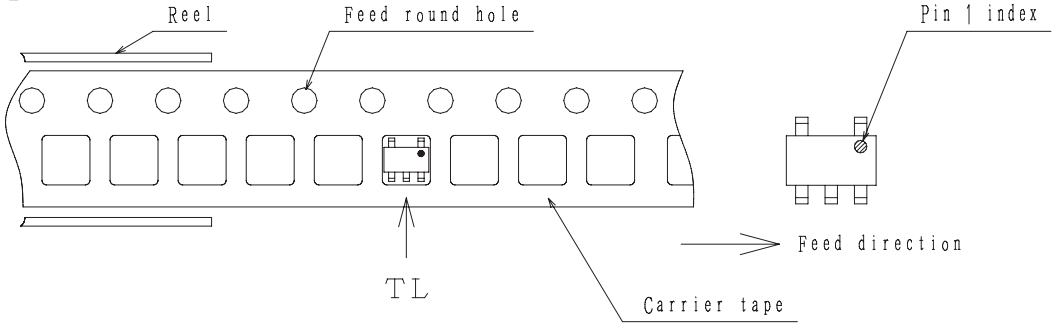
Label	JEITA Phase
LEAD FREE 3	JEITA Phase 3A
LEAD FREE 4	JEITA Phase 3

2. Taping configuration

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



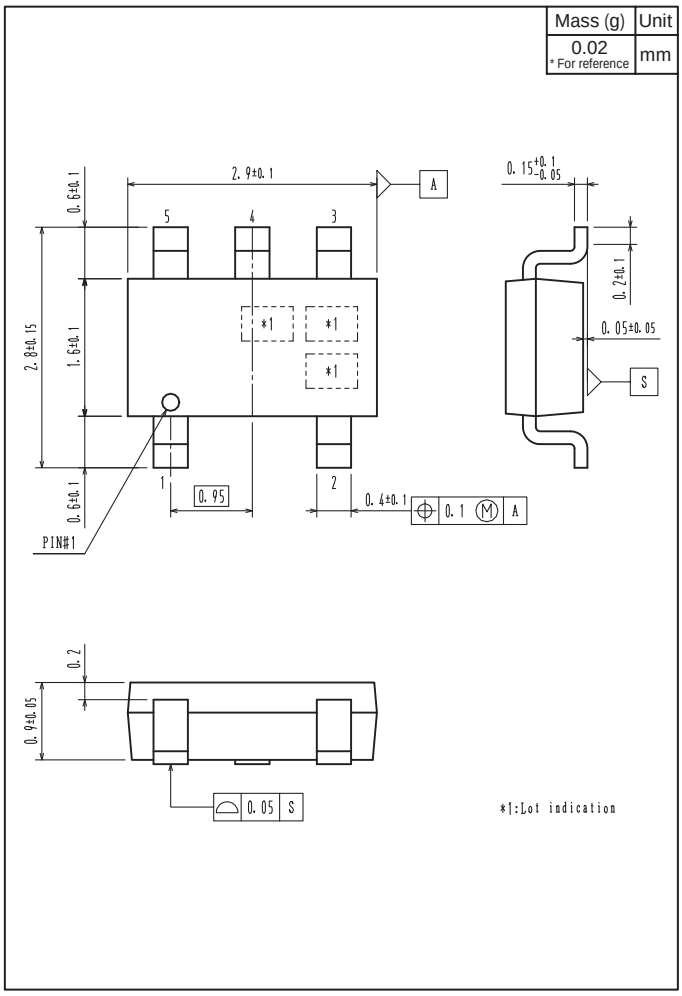
2-2. Device placement direction



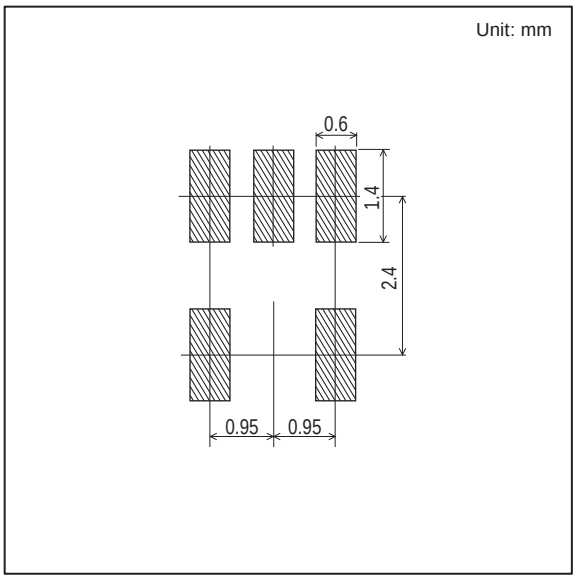
Those with pin 1 index on the feed hole side·····TL

Outline Drawing

CPH5871-TL-H



Land Pattern Example



Note on usage : Since the CPH5871 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.