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CPH5871

Power MOSFET 30V, 52mΩ, 3.5A, Single N-Channel with Schottky Diode

Features

- Composite Type with a N-channel Silicon MOSFET and a Schottky Barrier Diode Contained in One Package Facilitating High-density Mounting
- ESD Diode-Protected Gate
- Pb-Free, Halogen Free and RoHS Compliance
- [MOSFET] • High Speed Switching
 - 1.8V Drive
- [SBD] • Short Reverse Recovery Time
 - Low Forward Voltage

Specifications

Absolute Maximum Ratings at $T_a = 25^\circ\text{C}$

Parameter	Symbol	Value	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) $PW \leq 10\mu\text{s}$, duty cycle $\leq 1\%$	I_{DP}	14	A
Power Dissipation When mounted on ceramic substrate (600mm ² × 0.8mm) 1unit	P_D	0.9	W
Junction Temperature	T_J	150	°C
Storage Temperature	T_{stg}	-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 50Hz sine wave, 1cycle	I_{FSM}	10	A
Junction Temperature	T_J	-55 to +125	°C
Storage Temperature	T_{stg}	-55 to +125	°C

Thermal Resistance Ratings

Parameter	Symbol	Value	Unit
Junction to Ambient When mounted on ceramic substrate (600mm ² × 0.8mm) 1unit	$R_{\theta JA}$	138.8	°C/W

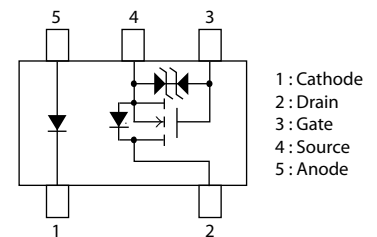
Stresses exceeding those listed in the Maximum Ratings table may damage the device. If any of these limits are exceeded, device functionality should not be assumed, damage may occur and reliability may be affected.

ORDERING INFORMATION

See detailed ordering and shipping information on page 6 of this data sheet.

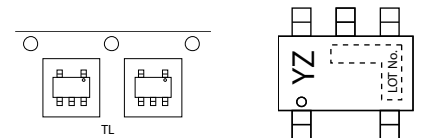
V_{DSS}	$R_{DS(on)}$ Max	I_D Max
[MOSFET] 30V	52mΩ@ 4.5V	3.5A
	74mΩ@ 2.5V	
	132mΩ@ 1.8V	

Electrical Connection N-Channel



Packing Type : TL

Marking



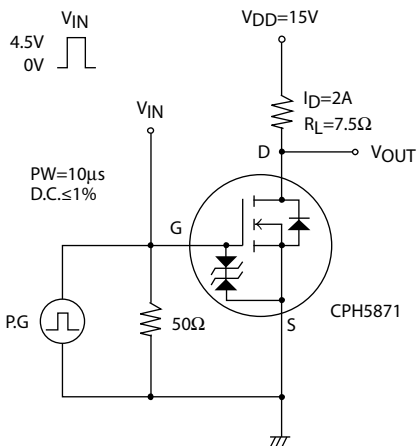
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Electrical Characteristics at Ta = 25°C

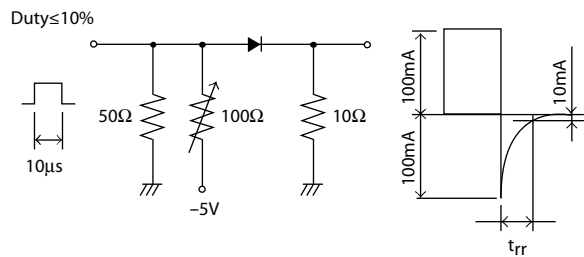
Parameter	Symbol	Conditions	Value			Unit
			min	typ	max	
[MOSFET]						
Drain to Source Breakdown Voltage	$V_{(BR)DSS}$	$I_D=1mA, V_{GS}=0V$	30			V
Zero-Gate Voltage Drain Current	I_{DSS}	$V_{DS}=30V, V_{GS}=0V$			1	μA
Gate to Source Leakage Current	I_{GSS}	$V_{GS}=\pm 8V, V_{DS}=0V$			± 10	μA
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS}=10V, I_D=1mA$	0.4		1.3	V
Forward Transconductance	g_{FS}	$V_{DS}=10V, I_D=2A$	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	$m\Omega$
	$R_{DS(on)2}$	$I_D=1A, V_{GS}=2.5V$		53	74	$m\Omega$
	$R_{DS(on)3}$	$I_D=0.5A, V_{GS}=1.8V$		82	132	$m\Omega$
Input Capacitance	C_{iss}	$V_{DS}=10V, f=1MHz$		430		pF
Output Capacitance	C_{oss}		59		pF	
Reverse Transfer Capacitance	C_{rss}		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	Q_g		$V_{DS}=15V, V_{GS}=4.5V, I_D=3.5A$		4.7	
Gate to Source Charge	Q_{gs}	0.8			nC	
Gate to Drain "Miller" Charge	Q_{gd}	1.1			nC	
Forward Diode 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	$V_R=10V, f=1MHz, 1cycle$		27		pF
Reverse Recovery Time	t_{rr}	$I_F=I_R=100mA$, See specified Test Circuit			10	ns

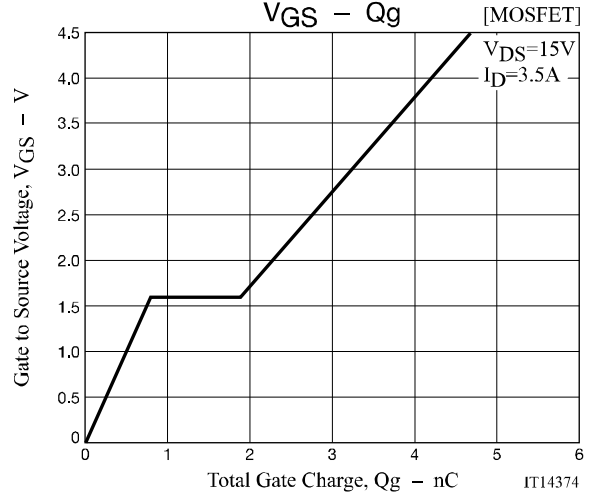
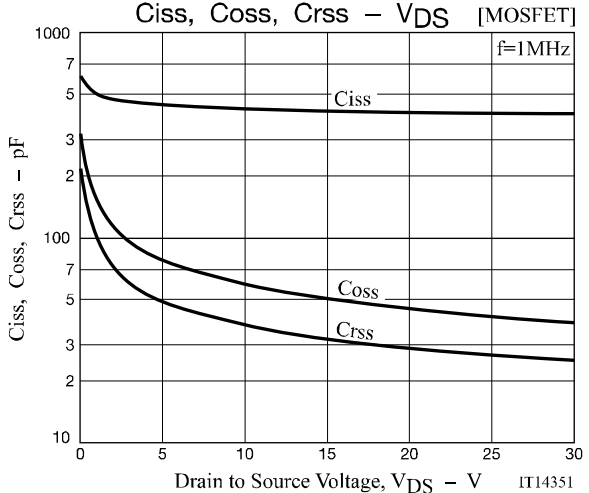
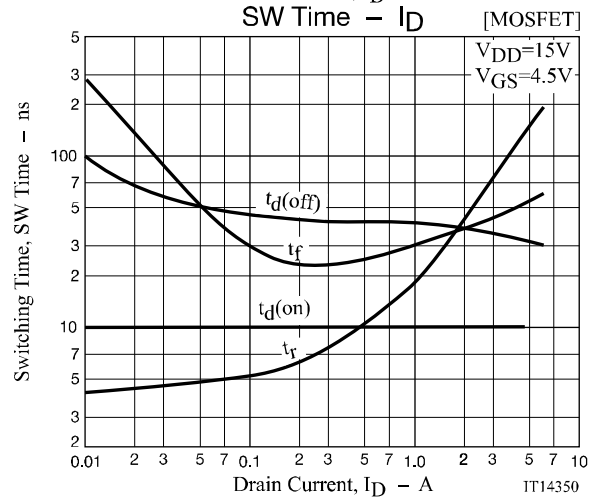
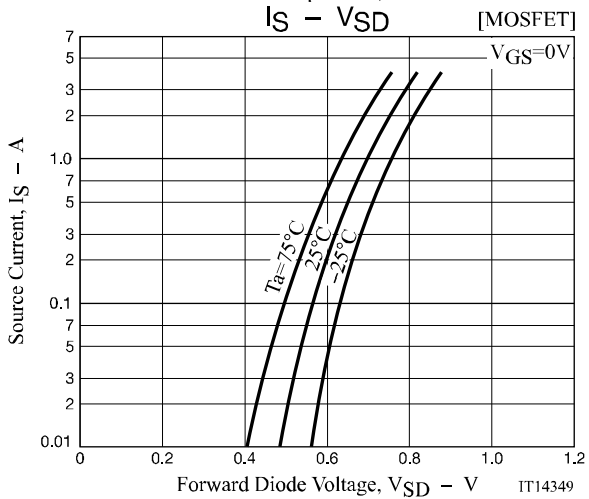
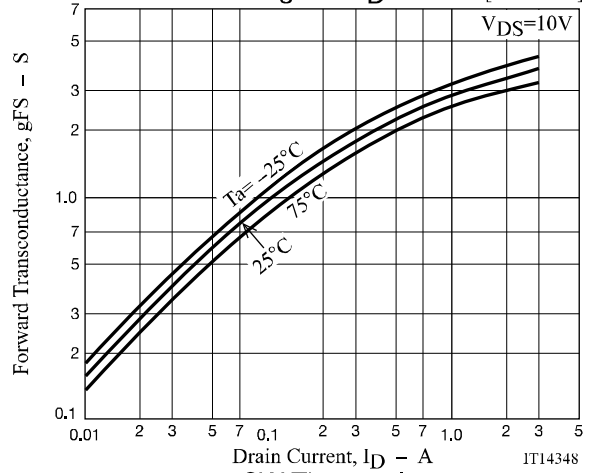
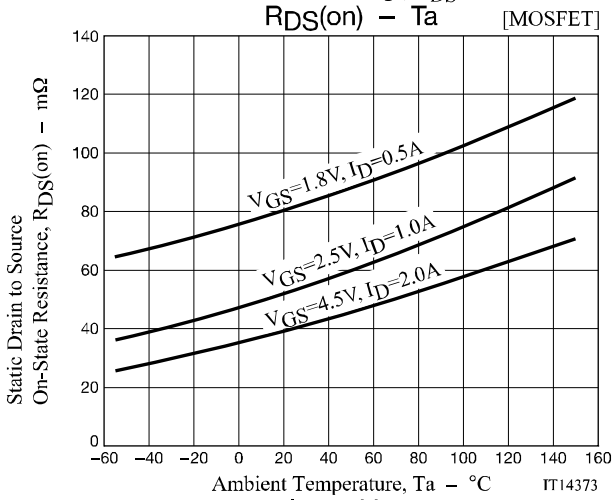
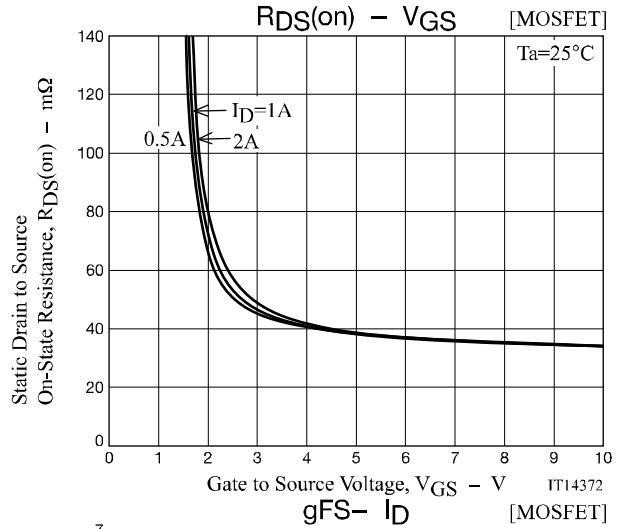
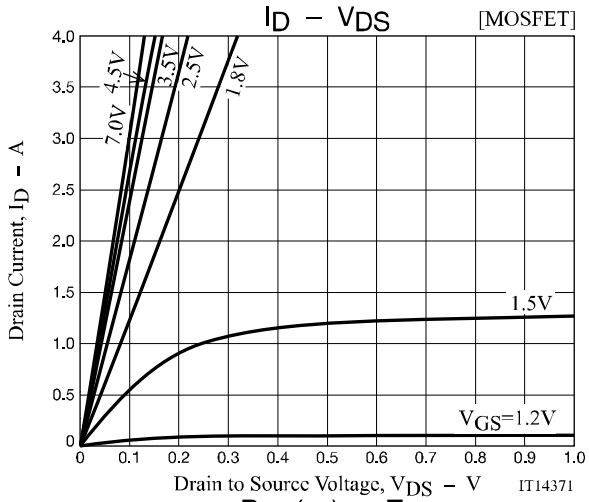
Product parametric performance is indicated in the Electrical Characteristics for the listed test conditions, unless otherwise noted. Product performance may not be indicated by the Electrical Characteristics if operated under different conditions.

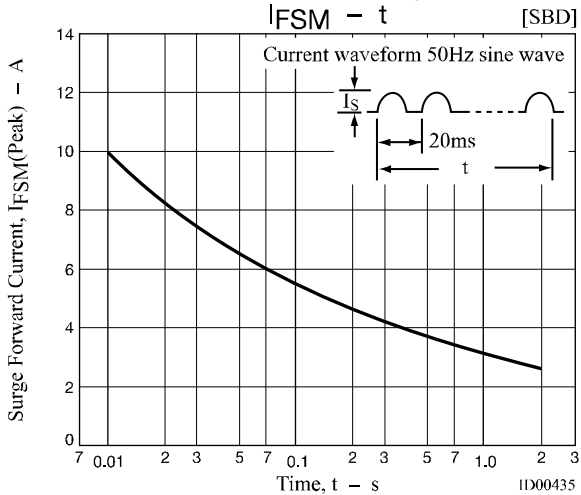
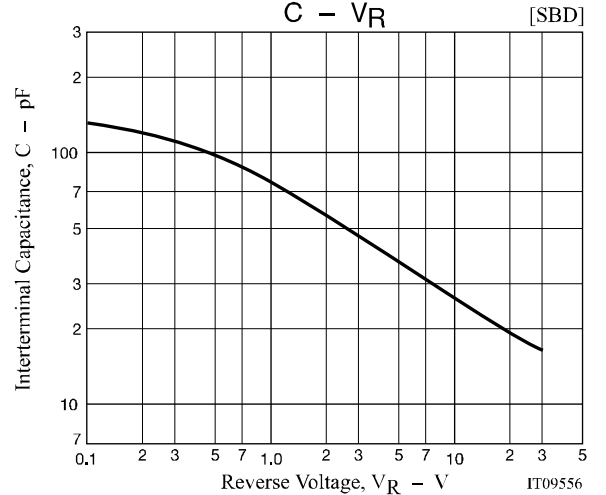
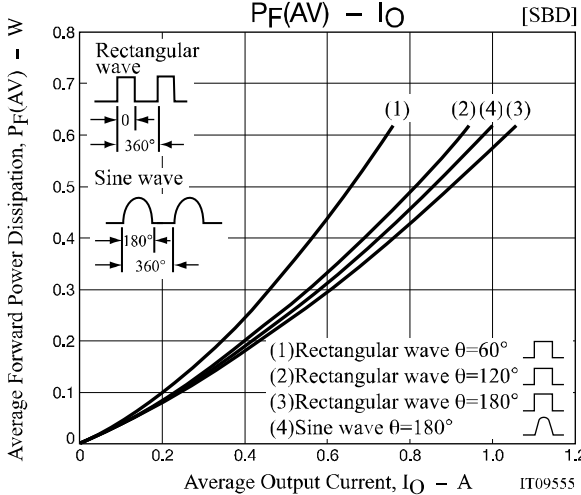
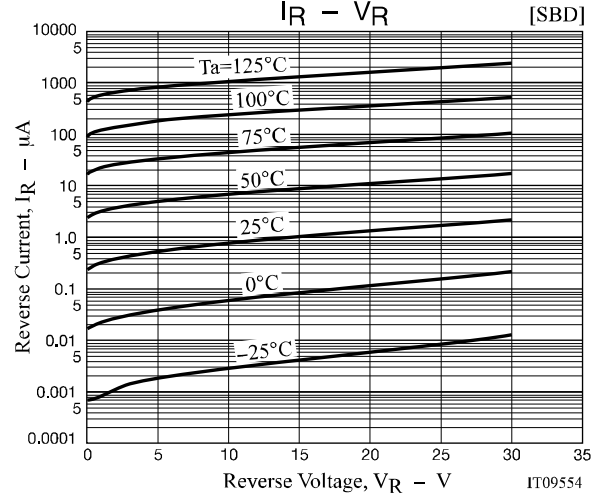
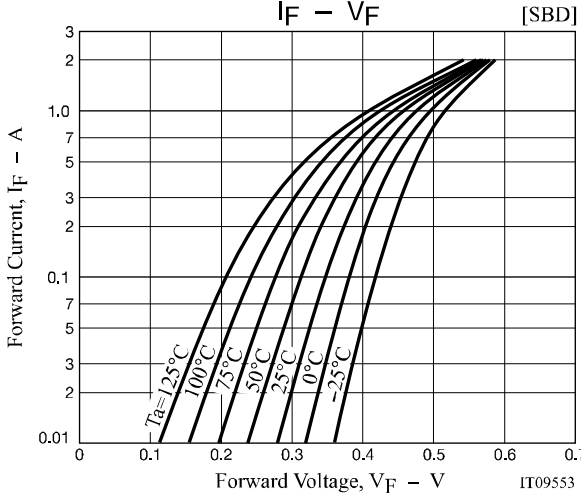
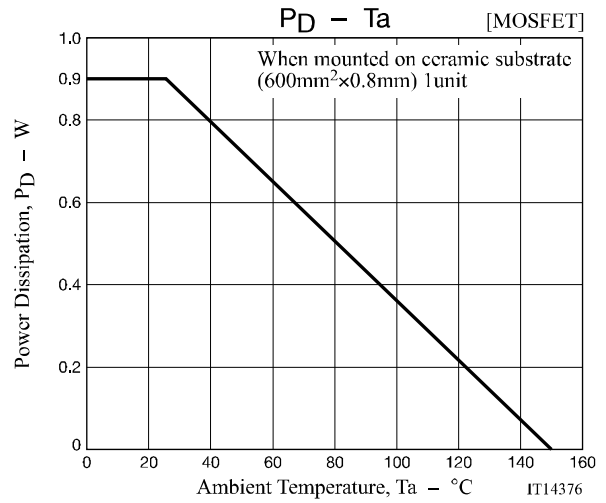
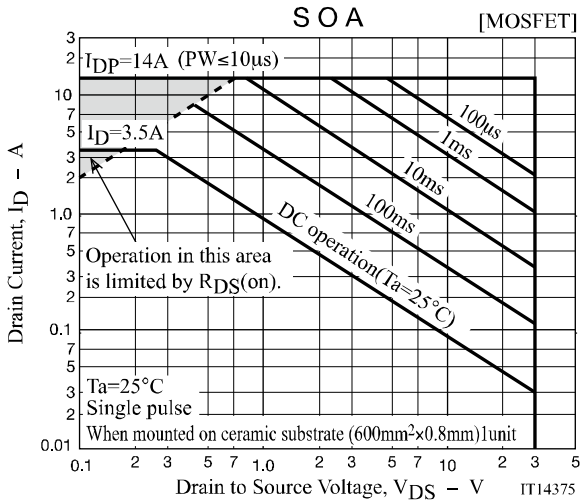
Switching Time Test Circuit (MOSFET)



t_{rr} Test Circuit (SBD)

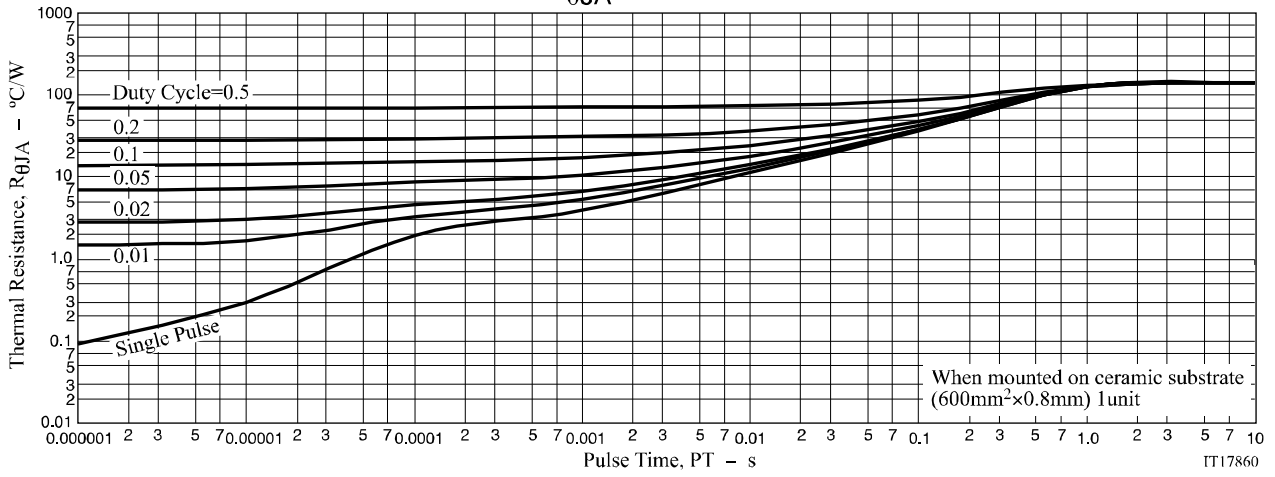






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R_{θJA} - Pulse Time



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Package Dimensions

CPH5871-TL-H / CPH5871-TL-W

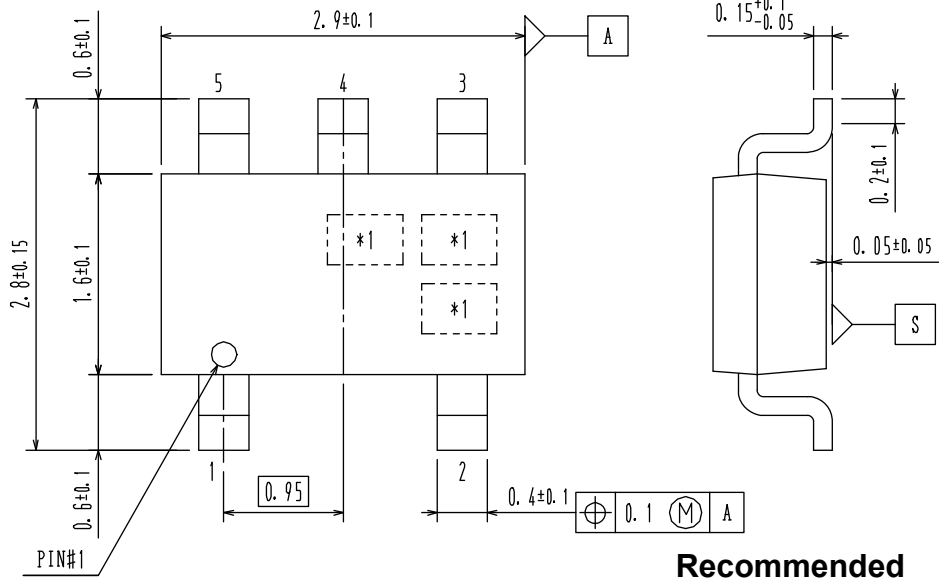
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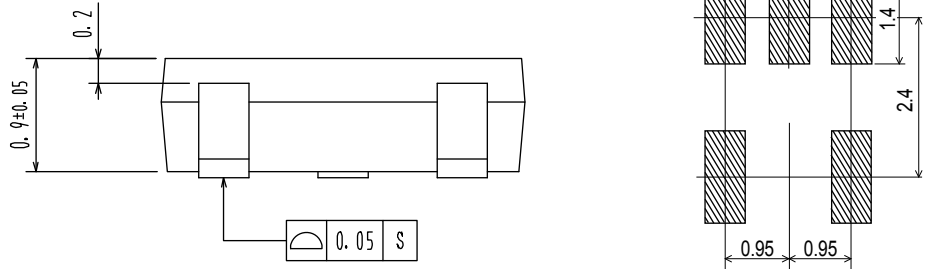
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unit : mm

- 1 : Cathode
- 2 : Drain
- 3 : Gate
- 4 : Source
- 5 : Anode



Recommended Soldering Footprint



*1: Lot indication

ORDERING INFORMATION

Device	Package	Shipping	Note
CPH5871-TL-H	CPH5 SC-74A, SOT-25	3,000 pcs. / Tape & Reel	Pb-Free and Halogen Free
CPH5871-TL-W			

† For information on tape and reel specifications, including part orientation and tape sizes, please refer to our Tape and Reel Packaging Specifications Brochure, BRD8011/D. http://www.onsemi.com/pub_link/Collateral/BRD8011-D.PDF

Note on usage : Since the CPH5871 is a MOSFET product, please avoid using this device in the vicinity of highly charged objects.

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