

MCH5839

Power MOSFET –20V, 266mΩ, –1.5A, Single P-Channel with Schottky Diode

MCH5839 is a P-Channel Power MOSFET, with Schottky Diode for general-purpose switching device applications.

Features

- Composite type with a P-Channel silicon MOSFET and a schottky barrier diode contained in one package facilitating high-density mounting
 - Pb-Free, Halogen Free and RoHS compliance
- [MOSFET]
- Low On-resistance
 - ESD Diode-Protected Gate
 - 1.8V drive
- [SBD]
- Short reverse recovery time
 - Low forward voltage

Typical Applications

- DC/DC Converter

SPECIFICATIONS

ABSOLUTE MAXIMUM RATING at Ta = 25°C (Note 1)

Parameter	Symbol	Value	Unit
[MOSFET]			
Drain to Source Voltage	V _{DSS}	–20	V
Gate to Source Voltage	V _{GSS}	±10	V
Drain Current (DC)	I _D	–1.5	A
Drain Current (Pulse) PW ≤ 10μs, duty cycle ≤ 1%	I _{DP}	–6	A
Power Dissipation When mounted on ceramic substrate (1000mm ² × 0.8mm) 1unit	P _D	0.8	W
Junction Temperature	T _j	150	°C
Storage Temperature	T _{stg}	–55 to +125	°C
[SBD]			
Repetitive Peak Reverse Voltage	V _{RRM}	15	V
Nonrepetitive Peak Reverse Surge Voltage	V _{RSM}	15	V
Average Output Current	I _O	1	A
Surge Forward Current 50Hz sine wave, 1cycle	I _{FSM}	3	A
Junction Temperature	T _j	–55 to +125	°C
Storage Temperature	T _{stg}	–55 to +125	°C

Note 1 : 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.

THERMAL RESISTANCE RATINGS

Parameter	Symbol	Value	Unit
Junction to Ambient When mounted on ceramic substrate (1000mm ² × 0.8mm) 1unit	R _{θJA}	156.2	°C/W



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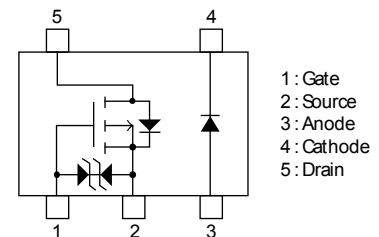
MOSFET

V _{DSS}	R _{DS(on)} Max	I _D Max
–20V	266mΩ@ –4.5V	–1.5A
	413mΩ@ –2.5V	
	645mΩ@ –1.8V	

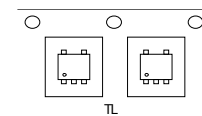
SCHOTTKY DIODE

V _{RRM}	V _F Max	I _{FSM}
15V	0.46V	3A

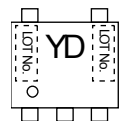
ELECTRICAL CONNECTION P-Channel



PACKING TYPE : TL



MARKING



ORDERING INFORMATION

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

MCH5839

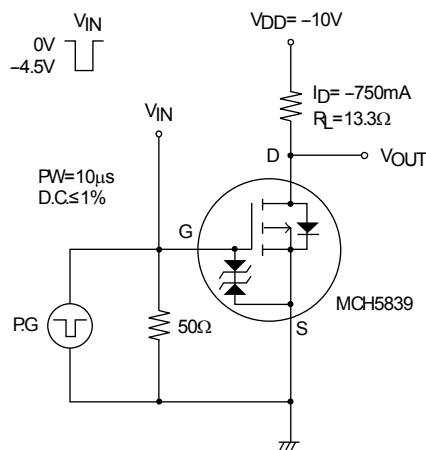
ELECTRICAL CHARACTERISTICS at Ta = 25°C (Note 2)

Parameter	Symbol	Conditions	Value			Unit
			min	typ	max	
[MOSFET]						
Drain to Source Breakdown Voltage	V(BR)DSS	ID=−1mA, VGS=0V	−20			V
Zero-Gate Voltage Drain Current	IDSS	VDS=−20V, VGS=0V			−1	μA
Gate to Source Leakage Current	IGSS	VGS=±8V, VDS=0V			±10	μA
Gate Threshold Voltage	VGS(th)	VDS=−10V, ID=−1mA	−0.4		−1.4	V
Forward Transconductance	gFS	VDS=−10V, ID=−750mA		1.9		S
Static Drain to Source On-State Resistance	RDS(on)1	ID=−750mA, VGS=−4.5V		205	266	mΩ
	RDS(on)2	ID=−300mA, VGS=−2.5V		295	413	mΩ
	RDS(on)3	ID=−100mA, VGS=−1.8V		430	645	mΩ
Input Capacitance	Ciss	VDS=−10V, f=1MHz		120		pF
Output Capacitance	Coss			26		pF
Reverse Transfer Capacitance	Crss			20		pF
Turn-ON Delay Time	t _d (on)	See specified Test Circuit		5.3		ns
Rise Time	t _r			9.7		ns
Turn-OFF Delay Time	t _d (off)			16		ns
Fall Time	t _f			14		ns
Total Gate Charge	Qg	VDS=−10V, VGS=−4.5V, ID=−1.5A		1.7		nC
Gate to Source Charge	Qgs			0.28		nC
Gate to Drain “Miller” Charge	Qgd			0.47		nC
Forward Diode Voltage	VSD	IS=−1.5A, VGS=0V		−0.89	−1.2	V
[SBD]						
Reverse Voltage	VR	IR=0.5mA	15			V
Forward Voltage	VF	IF=0.5A		0.4	0.46	V
Reverse Current	IR	VR=6V			90	μA
Interterminal Capacitance	C	VR=10V, f=1MHz		13		pF
Reverse Recovery Time	t _{rr}	IF=IR=100mA, See specified Test Circuit			10	ns

Note 2 : 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.

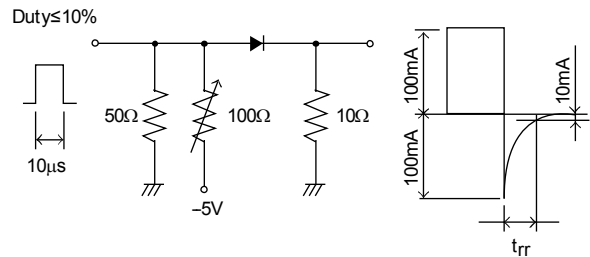
Switching Time Test Circuit

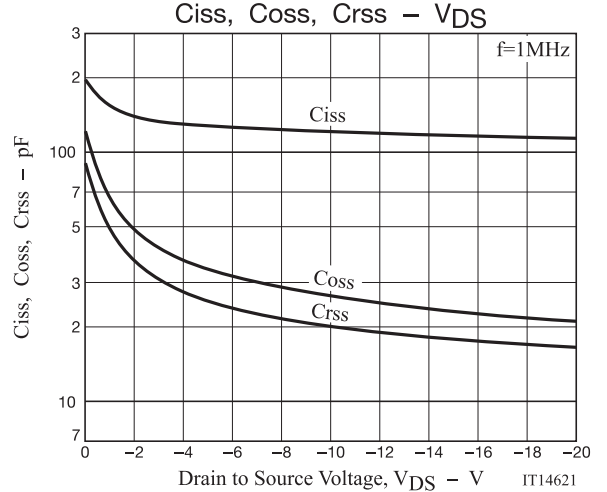
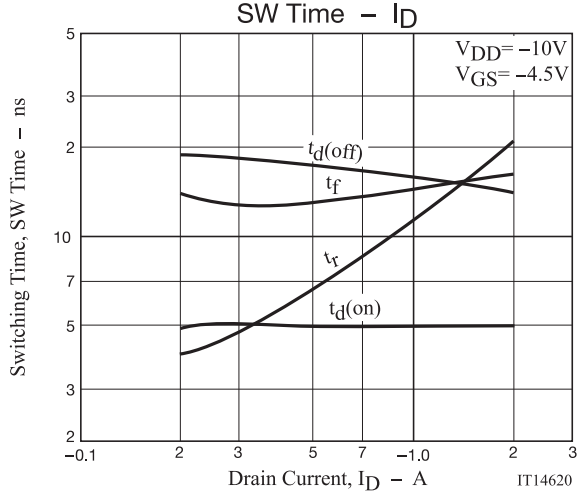
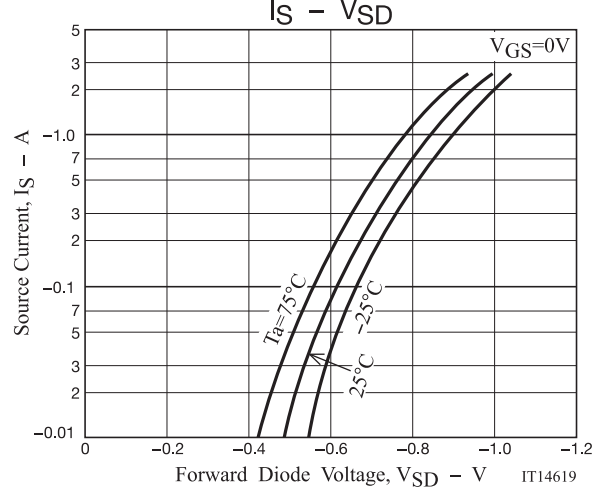
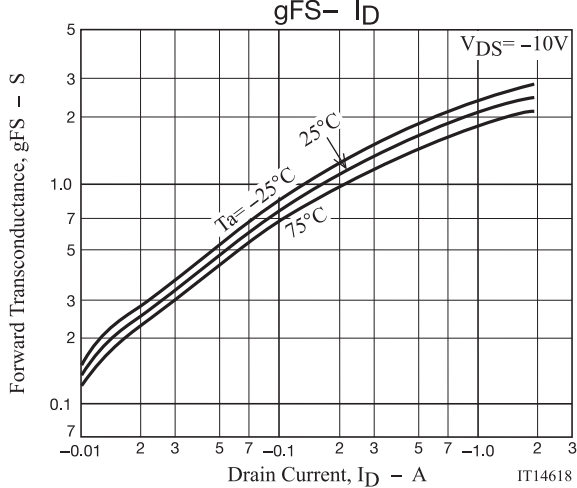
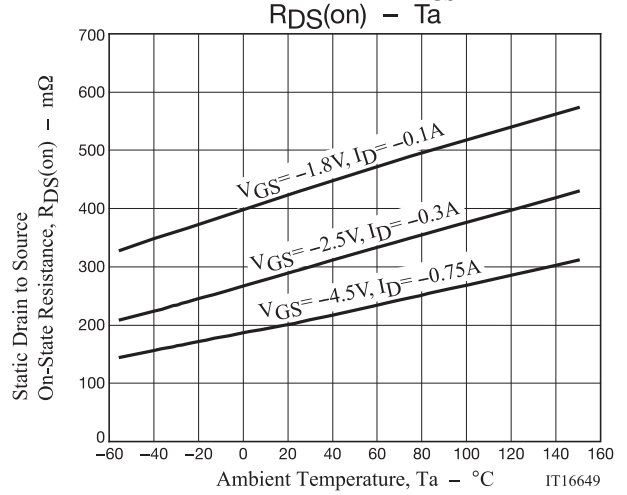
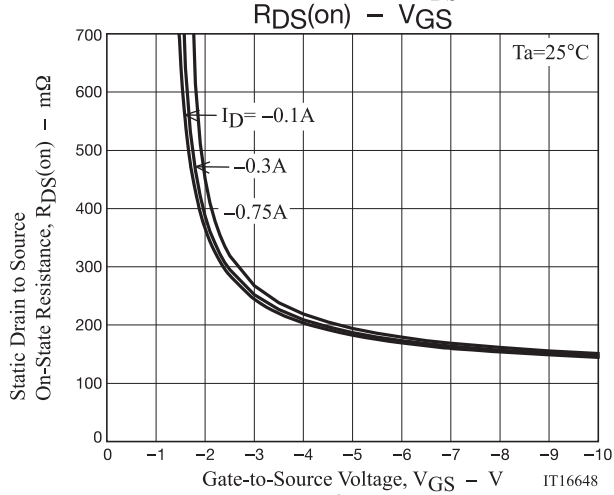
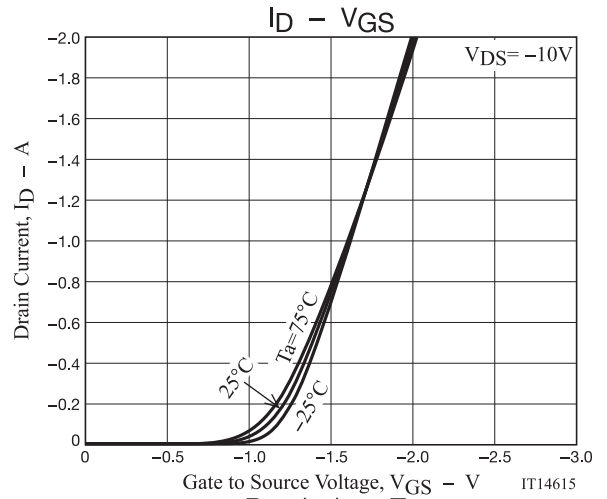
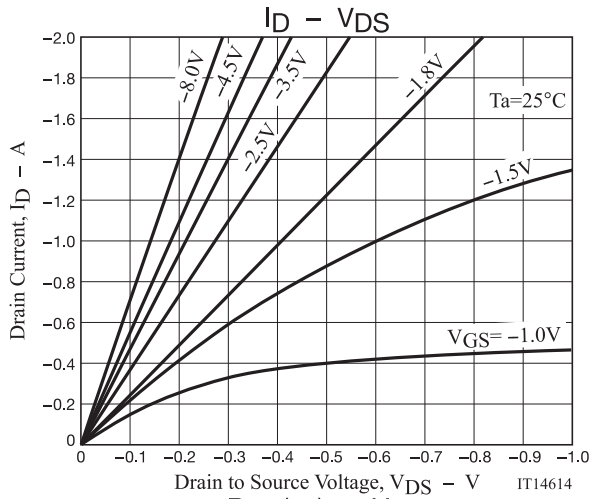
(MOSFET)

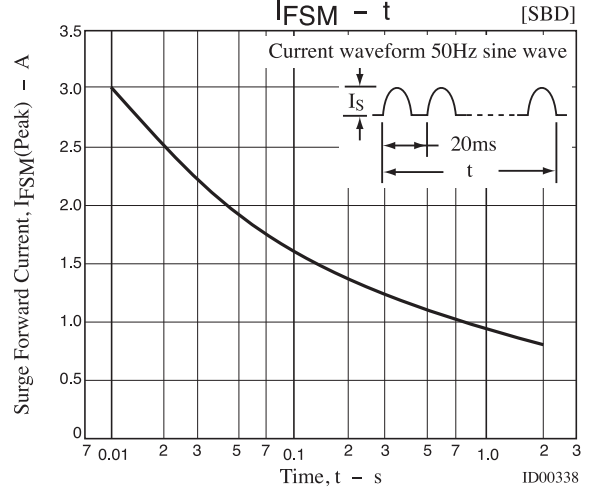
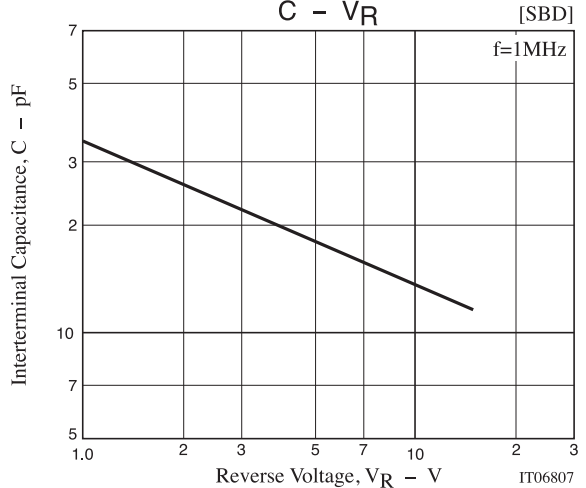
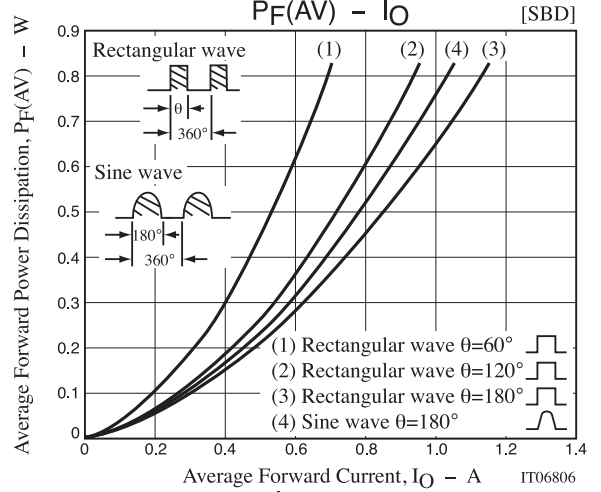
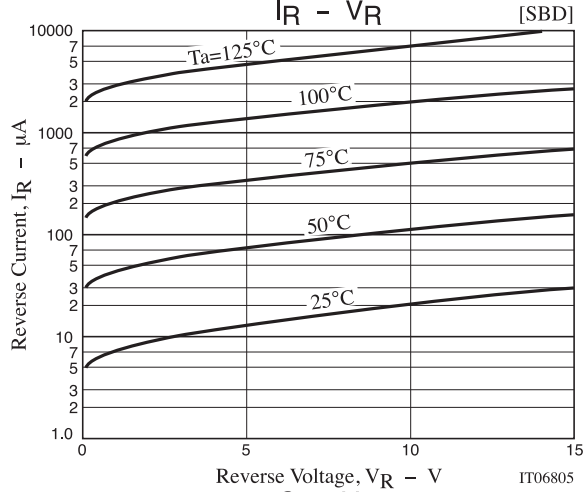
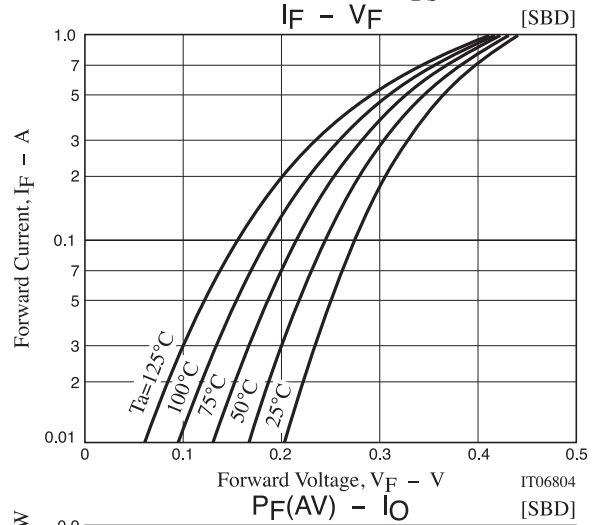
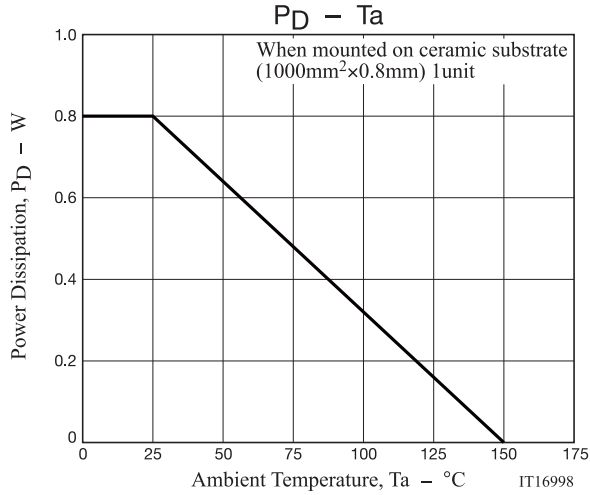
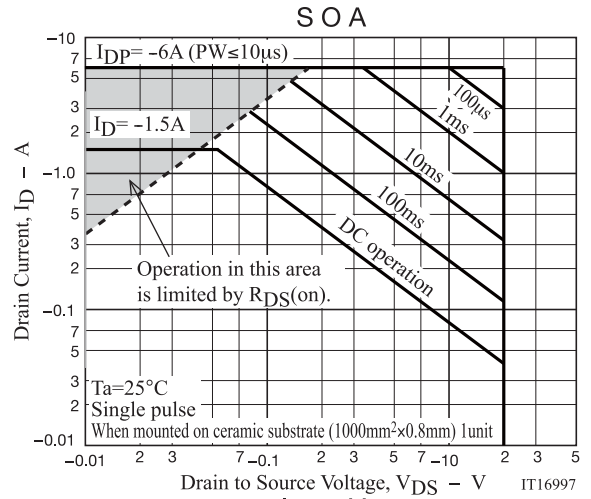
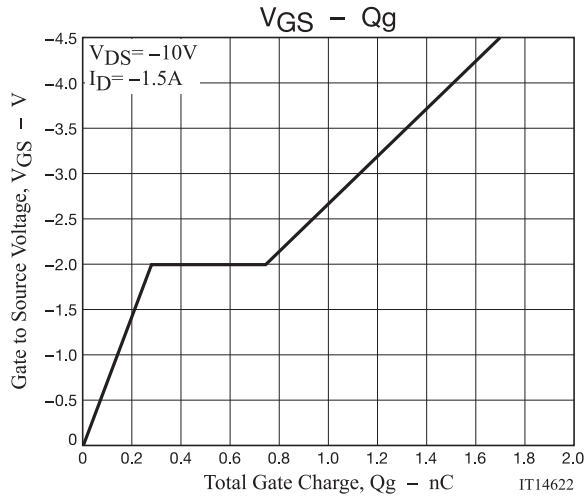


t_{rr} Test Circuit

(SBD)

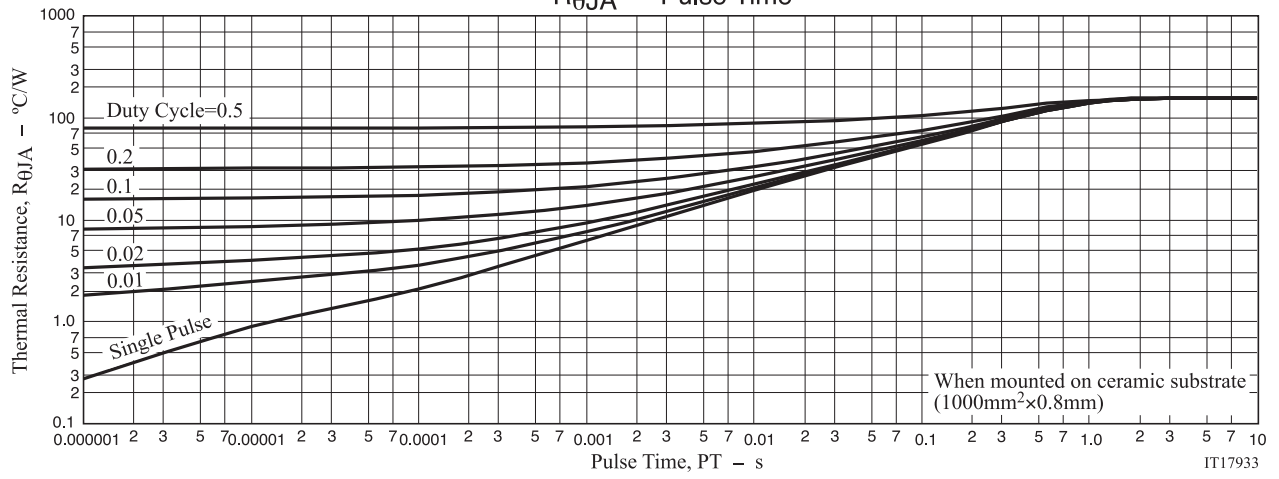






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$R_{\theta JA}$ - Pulse Time

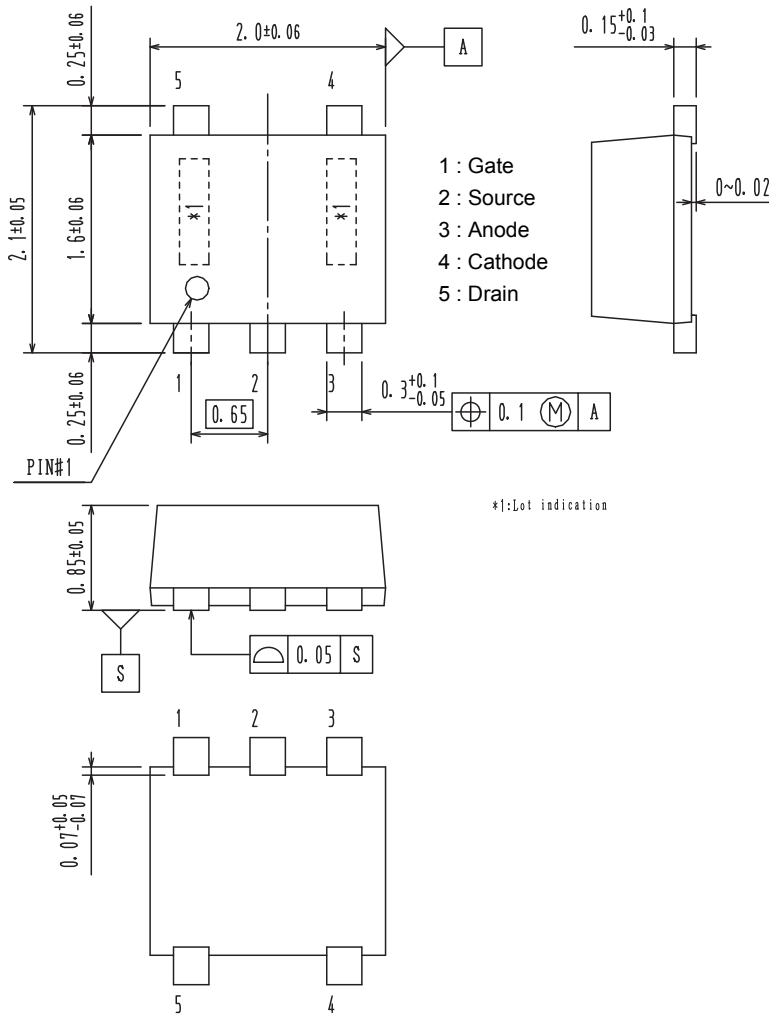


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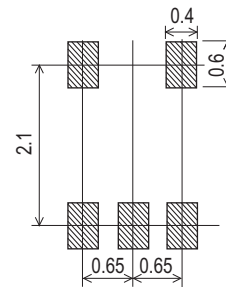
PACKAGE DIMENSIONS

unit : mm

SC-88AFL / MCPH5
CASE 419AP
ISSUE O



Recommended Soldering Footprint



ORDERING INFORMATION

Device	Marking	Package	Shipping (Qty / Packing)
MCH5839-TL-H	YD	SC-88AFL / MCPH5 (Pb-Free / Halogen Free)	3,000 / Tape & Reel
MCH5839-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 MCH5839 is a MOSFET product, please avoid using this device in the vicinity of highly charged objects.

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