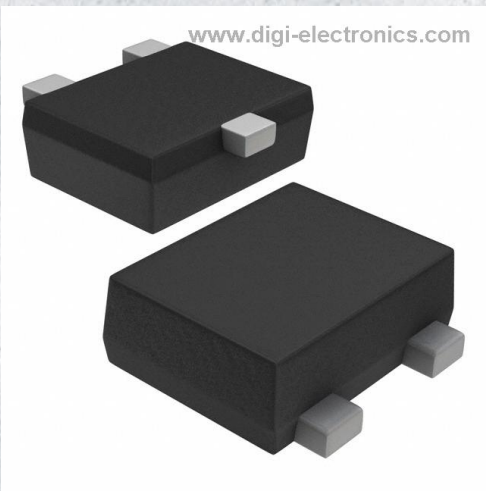
MCH3481-TL-W Datasheet



https://www.DiGi-Electronics.com

DiGi Electronics Part Number	MCH3481-TL-W-DG
Manufacturer	onsemi
Manufacturer Product Number	MCH3481-TL-W
Description	MOSFET N-CH 20V 2A SC70FL/MCPH3
Detailed Description	N-Channel 20 V 2A (Ta) 800mW (Ta) Surface Mount SC-70FL/MCPH3

Tel: +00 852-30501935

RFQ Email: Info@DiGi-Electronics.com

Purchase and inquiry

Manufacturer Product Number:	Manufacturer:
MCH3481-TL-W	onsemi
Series:	Product Status:
-	Obsolete
FET Type:	Technology:
N-Channel	MOSFET (Metal Oxide)
Drain to Source Voltage (Vdss):	Current - Continuous Drain (Id) @ 25°C:
20 V	2A (Ta)
Drive Voltage (Max Rds On, Min Rds On):	Rds On (Max) @ Id, Vgs:
1.2V, 4.5V	104mOhm @ 1A, 4.5V
Vgs(th) (Max) @ Id:	Gate Charge (Qg) (Max) @ Vgs:
900mV @ 1mA	2.9 nC @ 4.5 V
Vgs (Max):	Input Capacitance (Ciss) (Max) @ Vds:
±9V	175 pF @ 10 V
FET Feature:	Power Dissipation (Max):
-	800mW (Ta)
Operating Temperature:	Mounting Type:
150°C (TJ)	Surface Mount
Supplier Device Package:	Package / Case:
SC-70FL/MCPH3	3-SMD, Flat Lead
Base Product Number:	
MCH3481	

Environmental & Export classification

RoHS Status:	Moisture Sensitivity Level (MSL):
ROHS3 Compliant	1 (Unlimited)
REACH Status:	ECCN:
REACH Unaffected	EAR99
HTSUS:	
8541.21.0095	

MCH3481

Power MOSFET
20V, 104mΩ, 2A, Single N-Channel

ON Semiconductor®

www.onsemi.com

This Power MOSFET is produced using ON Semiconductor's trench technology, which is specifically designed to minimize gate charge and low on resistance. This device is suitable for applications with low gate charge driving or low on resistance requirements.

V_{DSS}	R_{DS}(on) Max	I_D Max
20V	104mΩ@ 4.5V	2A
	147mΩ@ 2.5V	
	203mΩ@ 1.8V	
	540mΩ@ 1.2V	

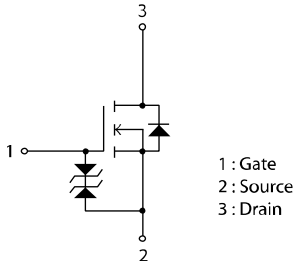
Features

- Low On-Resistance
- 1.2V drive
- ESD Diode-Protected Gate
- Pb-Free, Halogen Free and RoHS compliance

Typical Applications

- Load Switch

ELECTRICAL CONNECTION
N-Channel



SPECIFICATIONS

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

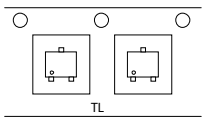
Parameter	Symbol	Value	Unit
Drain to Source Voltage	V_{DSS}	20	V
Gate to Source Voltage	V_{GSS}	±9	V
Drain Current (DC)	I_D	2	A
Drain Current (Pulse) PW ≤ 10μs, duty cycle ≤ 1%	I_{DP}	8	A
Power Dissipation When mounted on ceramic substrate (900mm^2 × 0.8mm)	P_D	0.8	W
Junction Temperature	Tj	150	°C
Storage Temperature	Tstg	−55 to +150	°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.

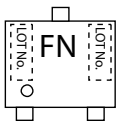
THERMAL RESISTANCE RATINGS

Parameter	Symbol	Value	Unit
Junction to Ambient When mounted on ceramic substrate (900mm^2 × 0.8mm)	$R_{\theta JA}$	156.2	°C/W

PACKING TYPE : TL



MARKING



ORDERING INFORMATION

See detailed ordering and shipping information on page 5 of this data sheet.

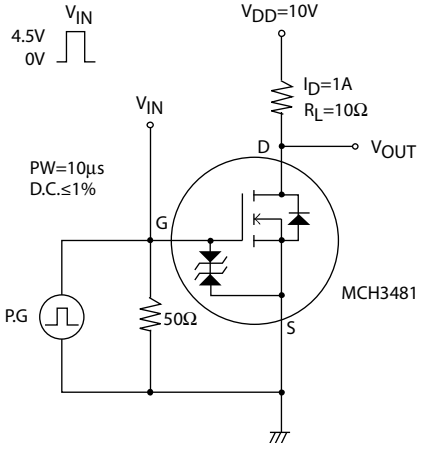
MCH3481

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

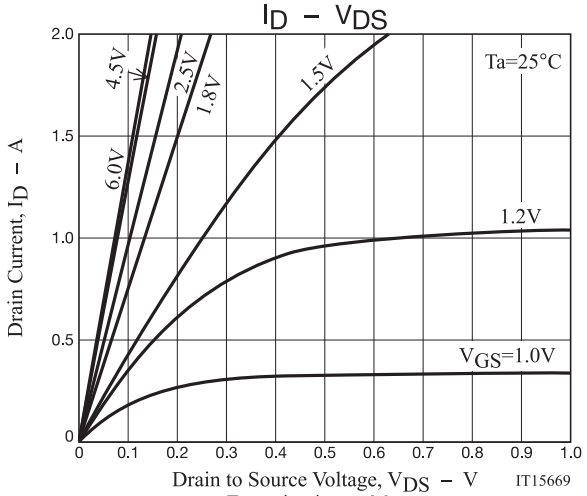
Parameter	Symbol	Conditions	Value			Unit
			min	typ	max	
Drain to Source Breakdown Voltage	$V_{(BR)DSS}$	I_D=1mA, V_{GS}=0V	20			V
Zero-Gate Voltage Drain Current	I_{DSS}	V_{DS}=20V, V_{GS}=0V			1	μA
Gate to Source Leakage Current	I_{GSS}	V_{GS}=±7.2V, V_{DS}=0V			±10	μA
Gate Threshold Voltage	$V_{GS}(th)$	V_{DS}=10V, I_D=1mA	0.3		0.9	V
Forward Transconductance	g_{FS}	V_{DS}=10V, I_D=1A		2.4		S
Static Drain to Source On-State Resistance	$R_{DS}(on)1$	I_D=1A, V_{GS}=4.5V		80	104	mΩ
	$R_{DS}(on)2$	I_D=0.5A, V_{GS}=2.5V		105	147	mΩ
	$R_{DS}(on)3$	I_D=0.3A, V_{GS}=1.8V		135	203	mΩ
	$R_{DS}(on)4$	I_D=0.1A, V_{GS}=1.2V		270	540	mΩ
Input Capacitance	Ciss	V_{DS}=10V, f=1MHz		175		pF
Output Capacitance	Coss			30		pF
Reverse Transfer Capacitance	Crss			25		pF
Turn-ON Delay Time	$t_d(on)$	See specified Test Circuit		6.6		ns
Rise Time	t_r			27		ns
Turn-OFF Delay Time	$t_d(off)$			28		ns
Fall Time	t_f			19		ns
Total Gate Charge	Qg	V_{DS}=10V, V_{GS}=4.5V, I_D=2A		2.9		nC
Gate to Source Charge	Qgs			0.46		nC
Gate to Drain “Miller” Charge	Qgd			0.53		nC
Forward Diode Voltage	V_{SD}	I_S=2A, V_{GS}=0V		0.85	1.2	V

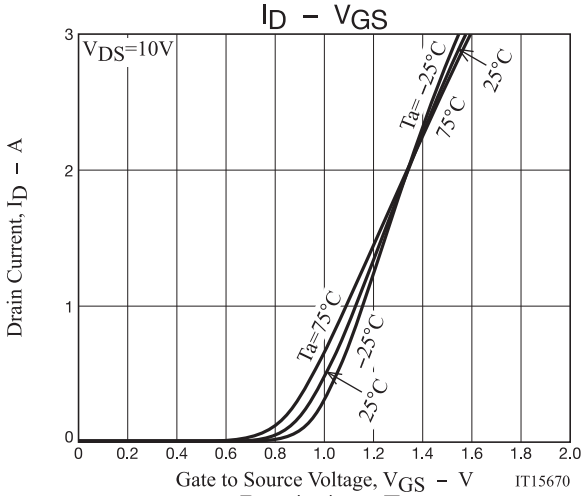
Note 2 : Product parametric performance is indicated in the Electrical Characteristics for the listed test conditions, unless otherwise noted. Product performance may not be indicated by the Electrical Characteristics if operated under different conditions.

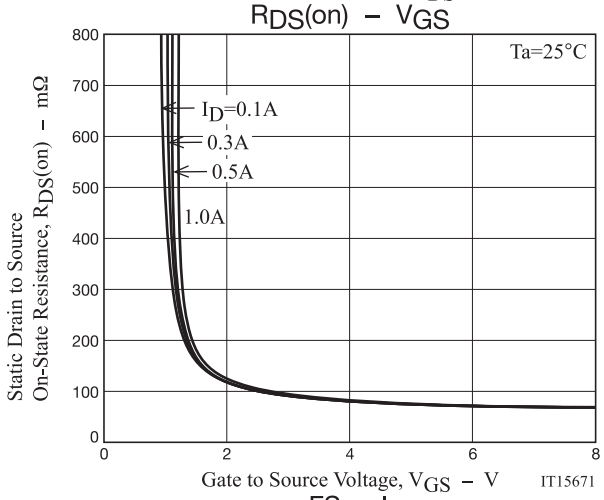
Switching Time Test Circuit

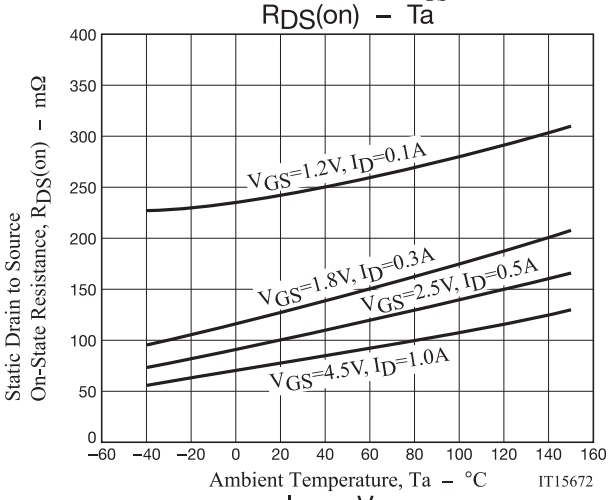


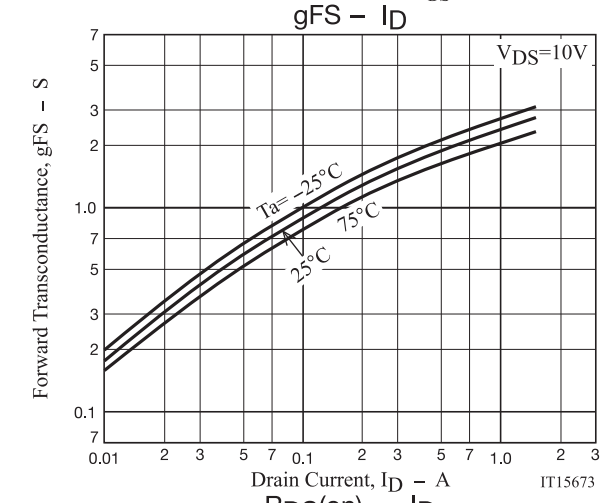
MCH3481

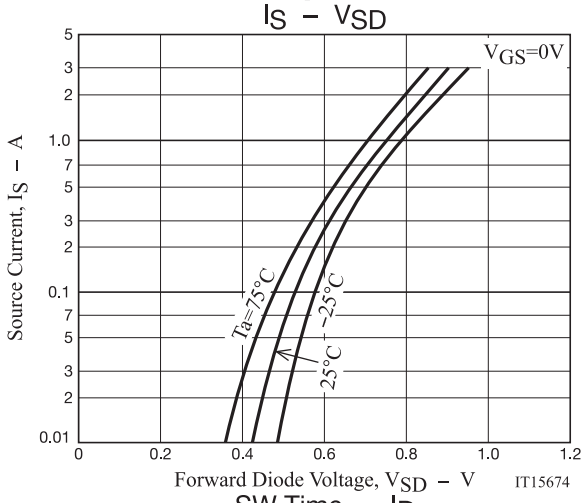

ID – VDS
Ta=25°C
4.5V
2.5V
1.8V
1.5V
6.0V
1.2V
VGS=1.0V
Drain Current, ID – A
Drain to Source Voltage, VDS – V
IT15669

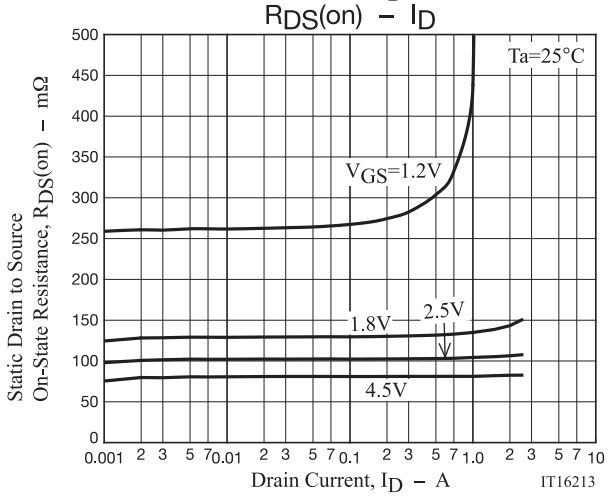

ID – VGS
VDS=10V
Ta= –25°C
75°C
25°C
Ta=75°C
–25°C
25°C
Drain Current, ID – A
Gate to Source Voltage, VGS – V
IT15670

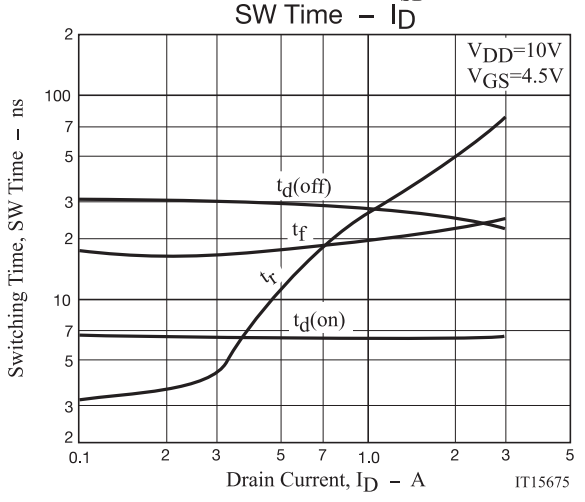

RDS(on) – VGS
Ta=25°C
ID=0.1A
0.3A
0.5A
1.0A
Static Drain to Source On-State Resistance, RDS(on) – mΩ
Gate to Source Voltage, VGS – V
IT15671


RDS(on) – Ta
VGS=1.2V, ID=0.1A
VGS=1.8V, ID=0.3A
VGS=2.5V, ID=0.5A
VGS=4.5V, ID=1.0A
Static Drain to Source On-State Resistance, RDS(on) – mΩ
Ambient Temperature, Ta – °C
IT15672

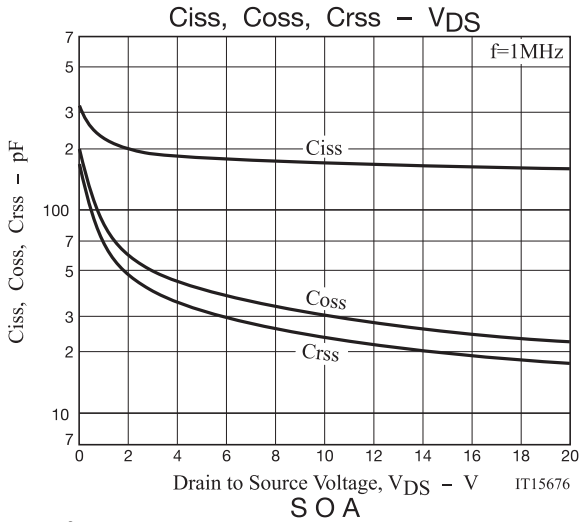

gFS – ID
VDS=10V
Ta= –25°C
75°C
25°C
Forward Transconductance, gFS – S
Drain Current, ID – A
IT15673

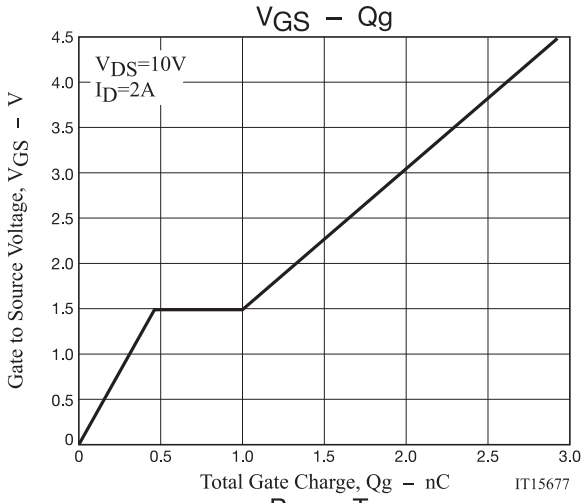

IS – VSD
VGS=0V
Ta=75°C
–25°C
25°C
Source Current, IS – A
Forward Diode Voltage, VSD – V
IT15674

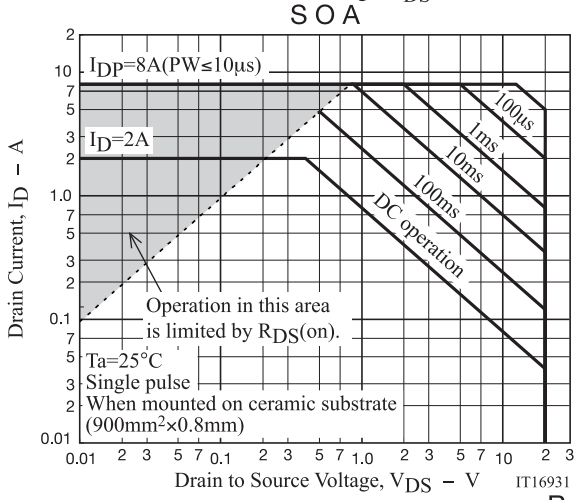

RDS(on) – ID
Ta=25°C
VGS=1.2V
1.8V
2.5V
4.5V
Static Drain to Source On-State Resistance, RDS(on) – mΩ
Drain Current, ID – A
IT16213

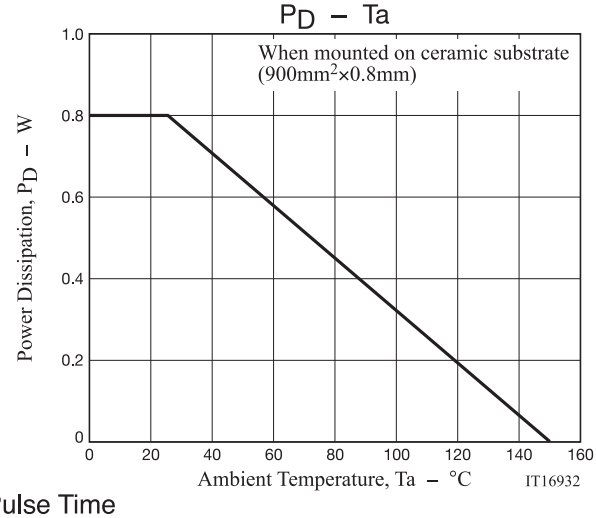

SW Time – ID
VDD=10V
VGS=4.5V
td(off)
tf
tr
td(on)
Switching Time, SW Time – ns
Drain Current, ID – A
IT15675

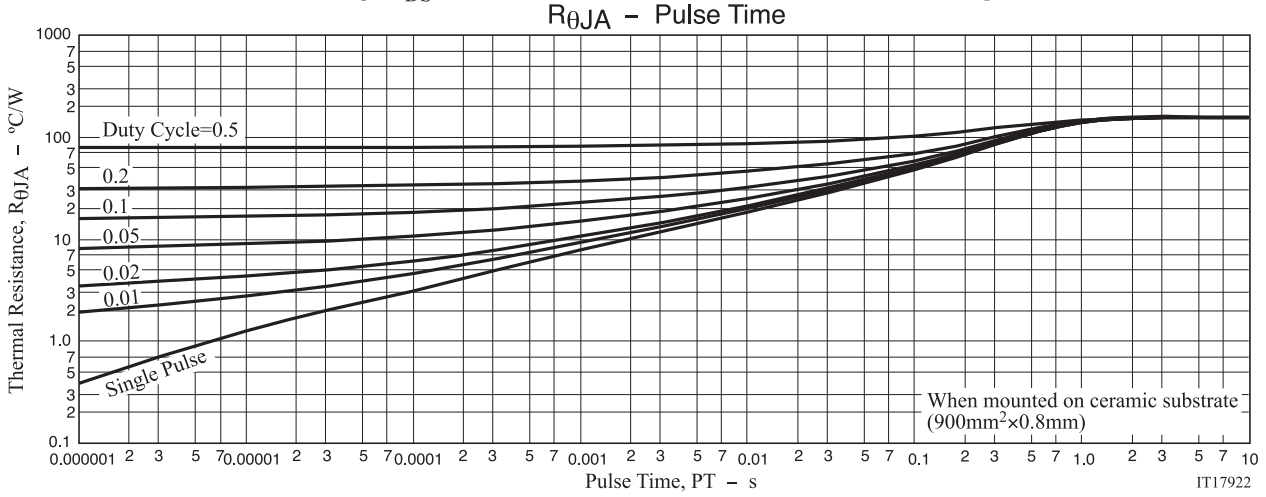
MCH3481


Ciss, Coss, Crss – VDS
f=1MHz
Ciss
Coss
Crss
Ciss, Coss, Crss – pF
Drain to Source Voltage, VDS – V
IT15676


VGS – Qg
VDS=10V
ID=2A
Gate to Source Voltage, VGS – V
Total Gate Charge, Qg – nC
IT15677


S O A
IDP=8A(PW≤10μs)
ID=2A
100μs
1ms
10ms
100ms
DC operation
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
IT16931


PD – Ta
When mounted on ceramic substrate
(900mm²×0.8mm)
Power Dissipation, PD – W
Ambient Temperature, Ta – °C
IT16932

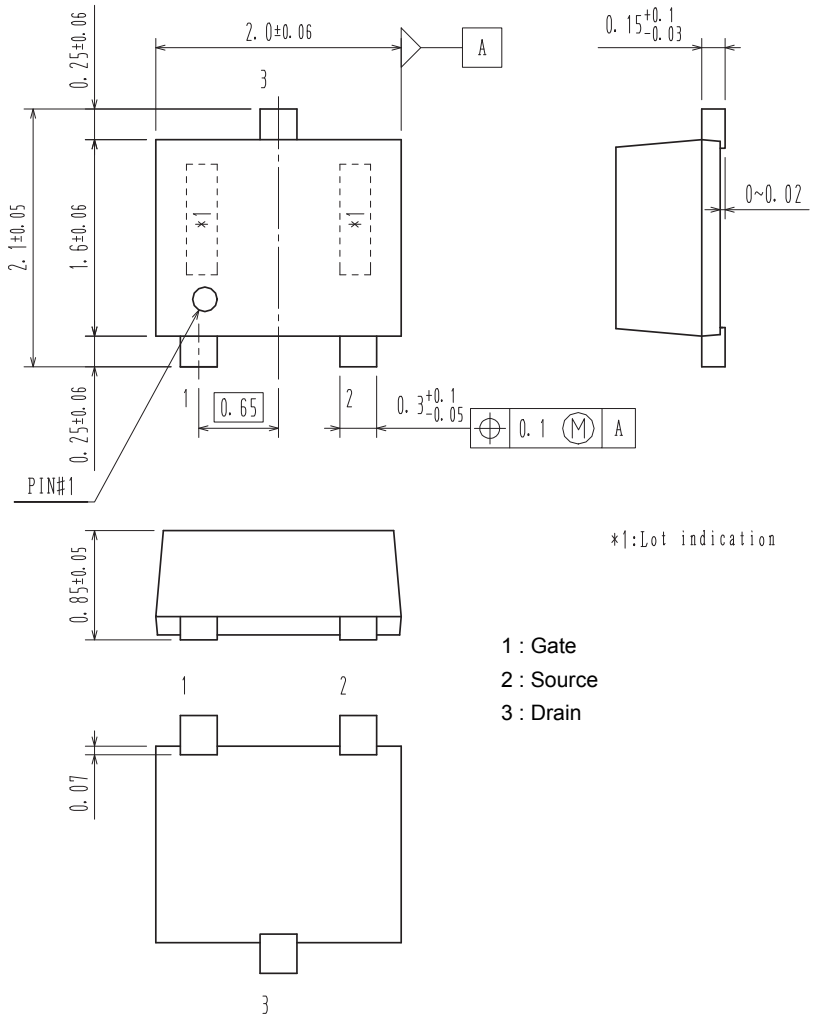

RθJA – Pulse Time
Duty Cycle=0.5
0.2
0.1
0.05
0.02
0.01
Single Pulse
When mounted on ceramic substrate
(900mm²×0.8mm)
Thermal Resistance, RθJA – °C/W
Pulse Time, PT – s
IT17922

MCH3481

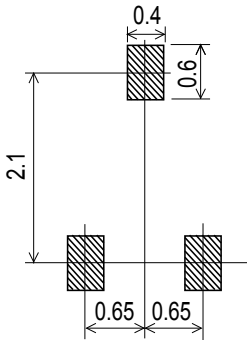
PACKAGE DIMENSIONS

unit : mm

SC-70FL / MCPH3
CASE 419AQ
ISSUE O



Recommended Soldering Footprint



ORDERING INFORMATION

Device	Marking	Package	Shipping (Qty / Packing)
MCH3481-TL-H	FN	SC-70FL / MCPH3 (Pb-Free / Halogen Free)	3,000 / Tape & Reel
MCH3481-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 MCH3481 is a MOSFET product, please avoid using this device in the vicinity of highly charged objects.

OUR CERTIFICATE

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