MCH3486

Power MOSFET
60V, 137mΩ, 2A, Single N-Channel

ON Semiconductor®

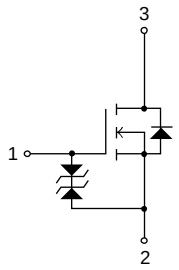
www.onsemi.com

V_{DSS}	R_{DS}(on) Max	I_D Max
60V	137 mΩ@10V	2A
	192 mΩ@4.5V	
	217 mΩ@4V	

Features

- Low R_{DS}(on)
- 4V Drive
- ESD Diode-Protected Gate
- Pb-Free, Halogen Free and RoHS Compliance
- Small Surface Mount Package (MCPH3)

Electrical Connection
N-Channel

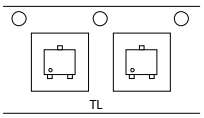


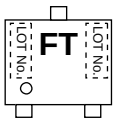
Specifications

Absolute Maximum Ratings at Ta = 25°C

Parameter	Symbol	Value	Unit
Drain to Source Voltage	V_{DSS}	60	V
Gate to Source Voltage	V_{GSS}	±20	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	1	W
Junction Temperature	Tj	150	°C
Storage Temperature	Tstg	–55 to +150	°C

Packing Type:TL **Marking**





Thermal Resistance Ratings

Parameter	Symbol	Value	Unit
Junction to Ambient When mounted on ceramic substrate (900mm^2×0.8mm)	$R_{\theta JA}$	125	°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

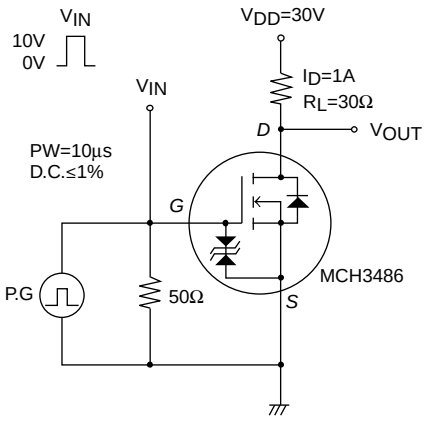
See detailed ordering and shipping information on page 5 of this data sheet.

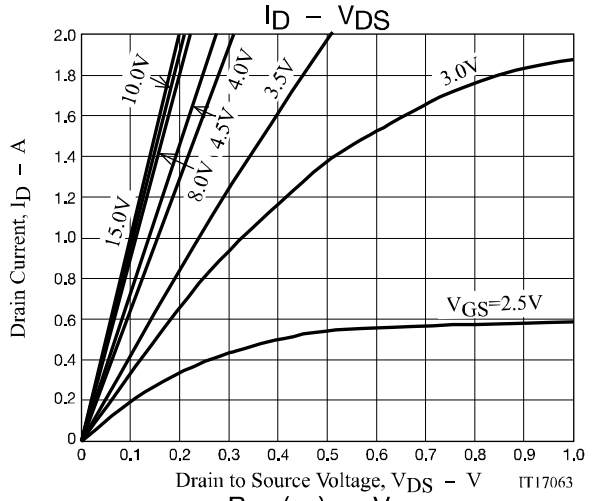
Electrical Characteristics at Ta = 25°C

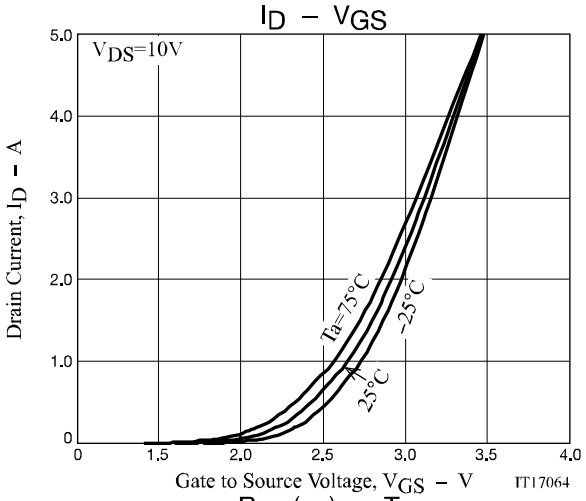
Parameter	Symbol	Conditions	Value			Unit
			min	typ	max	
Drain to Source Breakdown Voltage	$V_{(BR)DSS}$	I_D=1mA, V_{GS}=0V	60			V
Zero-Gate Voltage Drain Current	I_{DSS}	V_{DS}=60V, V_{GS}=0V			1	μA
Gate to Source Leakage Current	I_{GSS}	V_{GS}=±16V, V_{DS}=0V			±10	μA
Gate Threshold Voltage	$V_{GS}(th)$	V_{DS}=10V, I_D=1mA	1.2		2.6	V
Forward Transconductance	g_{FS}	V_{DS}=10V, I_D=1A		1.8		S
Static Drain to Source On-State Resistance	$R_{DS}(on)1$	I_D=1A, V_{GS}=10V		105	137	mΩ
	$R_{DS}(on)2$	I_D=0.5A, V_{GS}=4.5V		137	192	mΩ
	$R_{DS}(on)3$	I_D=0.5A, V_{GS}=4V		155	217	mΩ
Input Capacitance	Ciss	V_{DS}=20V, f=1MHz		310		pF
Output Capacitance	Coss			40		pF
Reverse Transfer Capacitance	Crss			25		pF
Turn-ON Delay Time	$t_d(on)$	See specified Test Circuit		6		ns
Rise Time	t_r			5		ns
Turn-OFF Delay Time	$t_d(off)$			28		ns
Fall Time	t_f			11		ns
Total Gate Charge	Qg	V_{DS}=30V, V_{GS}=10V, I_D=2A		7		nC
Gate to Source Charge	Qgs			1		nC
Gate to Drain “Miller” Charge	Qgd			1.3		nC
Forward Diode Voltage	V_{SD}	I_S=2A, V_{GS}=0V		0.83	1.2	V

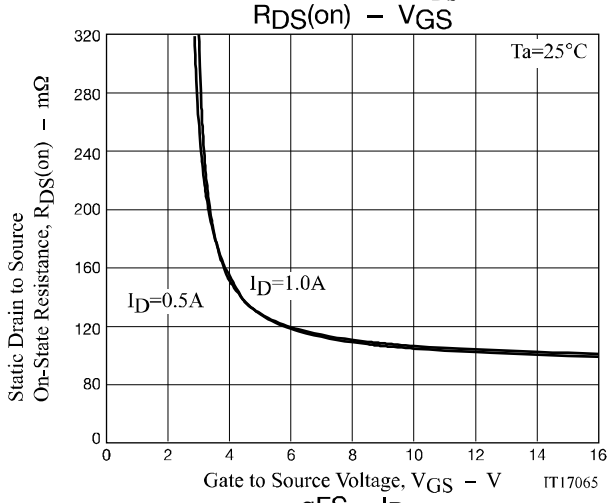
Product parametric performance is indicated in the Electrical Characteristics for the listed test conditions, unless otherwise noted. Product performance may not be indicated by the Electrical Characteristics if operated under different conditions.

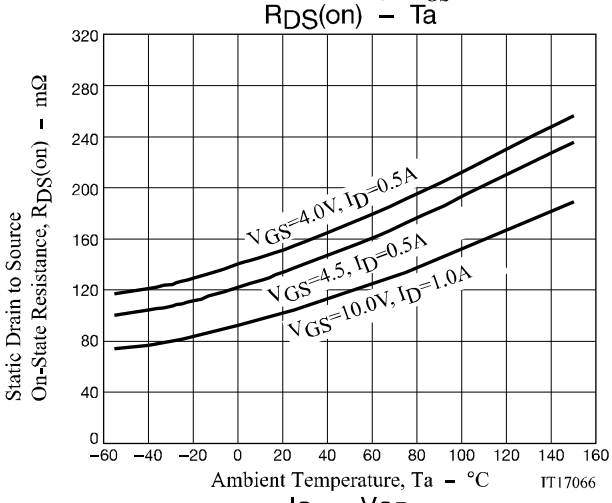
Switching Time Test Circuit

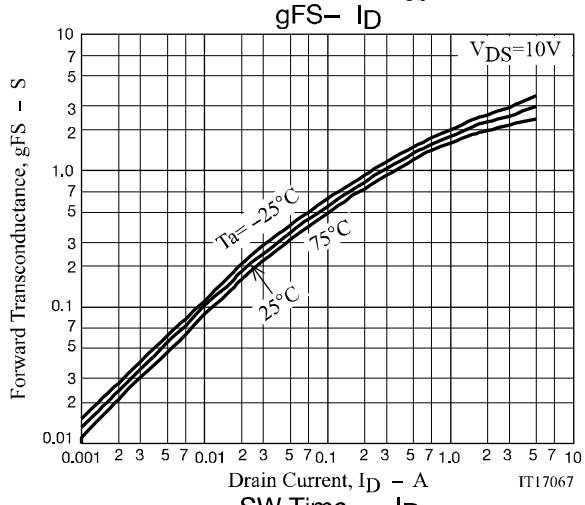


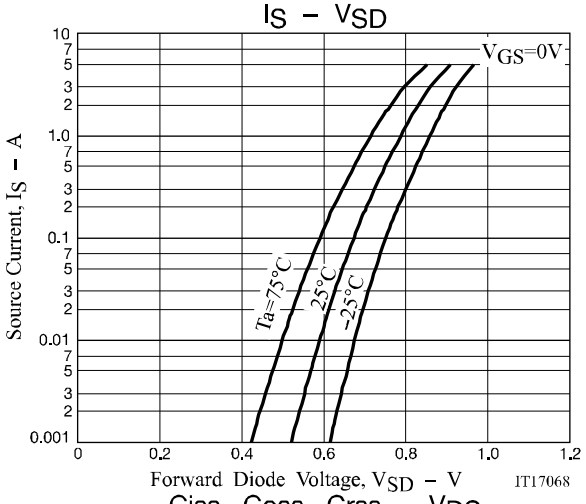

ID – VDS
Drain Current, ID – A
Drain to Source Voltage, VDS – V
IT17063
10.0V
15.0V
8.0V
4.5V - 4.0V
3.5V
3.0V
VGS=2.5V

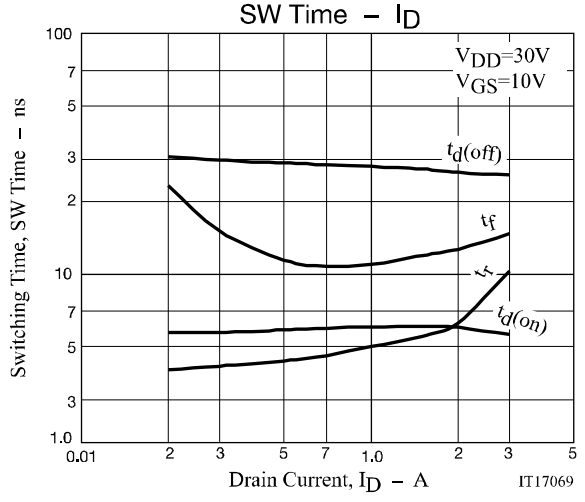

ID – VGS
VDS=10V
Drain Current, ID – A
Gate to Source Voltage, VGS – V
IT17064
Ta=75°C
25°C
–25°C

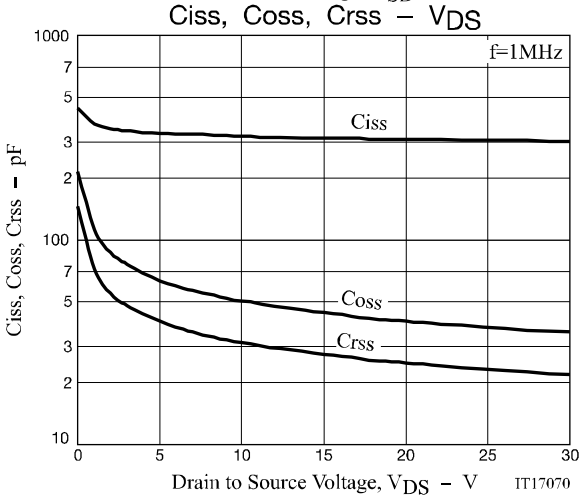

RDS(on) – VGS
Ta=25°C
Static Drain to Source On-State Resistance, RDS(on) – mΩ
Gate to Source Voltage, VGS – V
IT17065
ID=0.5A
ID=1.0A

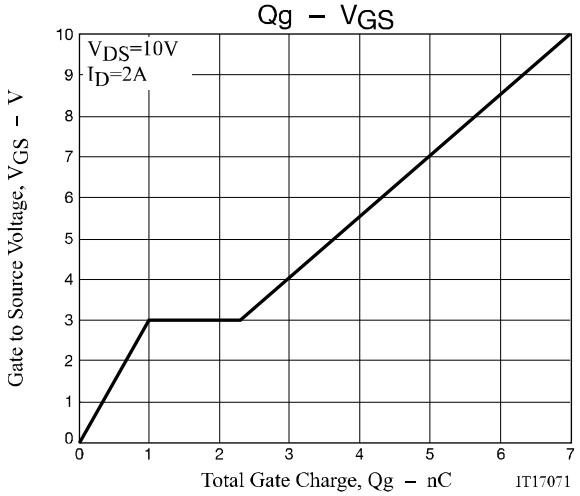

RDS(on) – Ta
Static Drain to Source On-State Resistance, RDS(on) – mΩ
Ambient Temperature, Ta – °C
IT17066
VGS=4.0V, ID=0.5A
VGS=4.5, ID=0.5A
VGS=10.0V, ID=1.0A

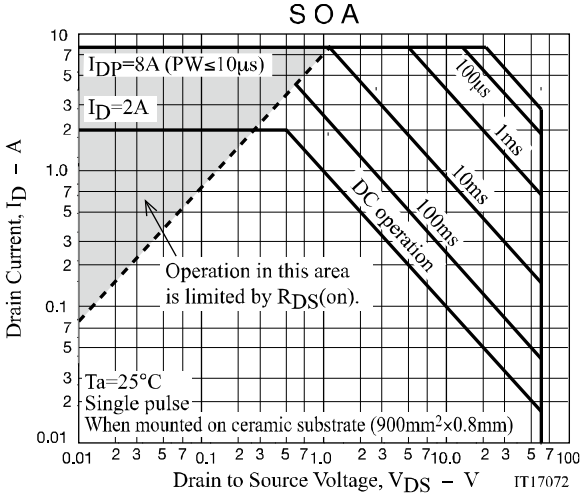

gFS– ID
VDS=10V
Forward Transconductance, gFS – S
Drain Current, ID – A
IT17067
Ta= –25°C
75°C
25°C

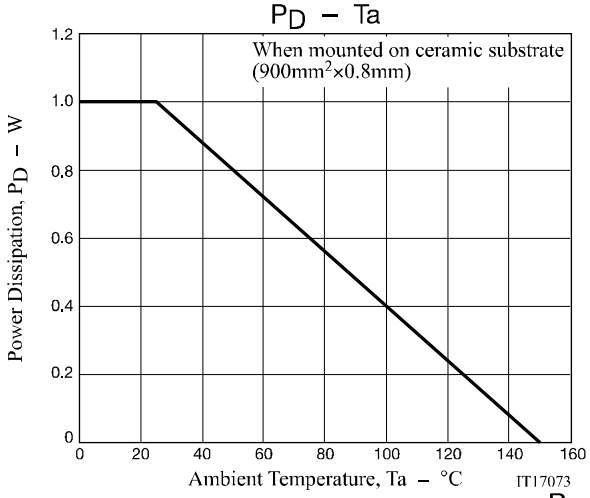

IS – VSD
VGS=0V
Source Current, IS – A
Forward Diode Voltage, VSD – V
IT17068
Ta=75°C
25°C
–25°C

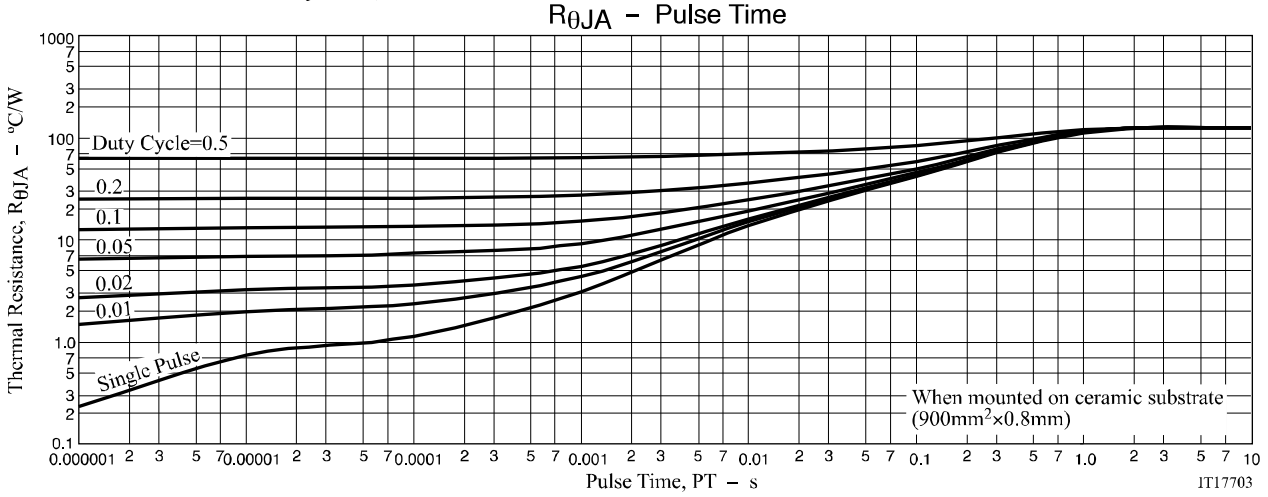

SW Time – ID
VDD=30V
VGS=10V
Switching Time, SW Time – ns
Drain Current, ID – A
IT17069
td(off)
tf
tr
td(on)


Ciss, Coss, Crss – VDS
f=1MHz
Ciss, Coss, Crss – pF
Drain to Source Voltage, VDS – V
IT17070
Ciss
Coss
Crss


Qg – VGS
VDS=10V
ID=2A
Gate to Source Voltage, VGS – V
Total Gate Charge, Qg – nC
IT17071


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
IT17072


PD – Ta
When mounted on ceramic substrate
(900mm2×0.8mm)
Power Dissipation, PD – W
Ambient Temperature, Ta – °C
IT17073


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
IT17703

Package Dimensions

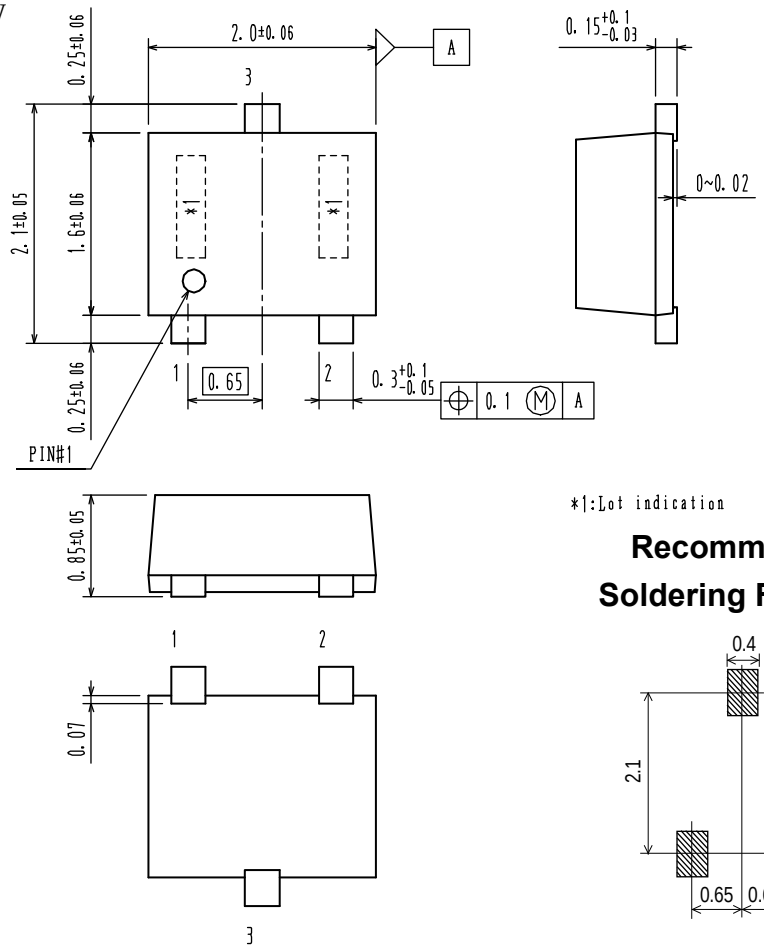
MCH3486-TL-H/ MCH3486-TL-W

MCPH3

CASE 419AQ
ISSUE O

Unit : mm

1 : Gate
2 : Source
3 : Drain



Recommended Soldering Footprint

Ordering & Package Information

Device	Package	Shipping	Note
MCH3486-TL-H	MCPH3 SC-70,SOT-323	3,000 pcs. / reel	Pb-Free and Halogen Free
MCH3486-TL-W			

Note on usage : Since the MCH3486 is a MOSFET product, please avoid using this device in the vicinity of highly charged objects.

AMEYA360
Components Supply Platform

Authorized Distribution Brand :

Website :

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Contact Us :

- ### Address :

  401 Building No.5, JiuGe Business Center, Lane 2301, Yishan Rd
  Minhang District, Shanghai , China

- ### Sales :

  Direct +86 (21) 6401-6692

  Email amall@ameya360.com

  QQ 800077892

  Skype ameyasales1 ameyasales2

- ### Customer Service :

  Email service@ameya360.com

- ### Partnership :

  Tel +86 (21) 64016692-8333

  Email mkt@ameya360.com