Ordering number : ENA1564B

MCH3376

Power MOSFET
−20V, 241mΩ, −1.5A, Single P-Channel

ON Semiconductor®
http://onsemi.com

Features

- ESD diode-Protected gate
- High speed switching and Low loss
- Pb-free and RoHS Compliance
- Drive at low voltage:1.8V drive
- Low R_{DS}(on)

Specifications

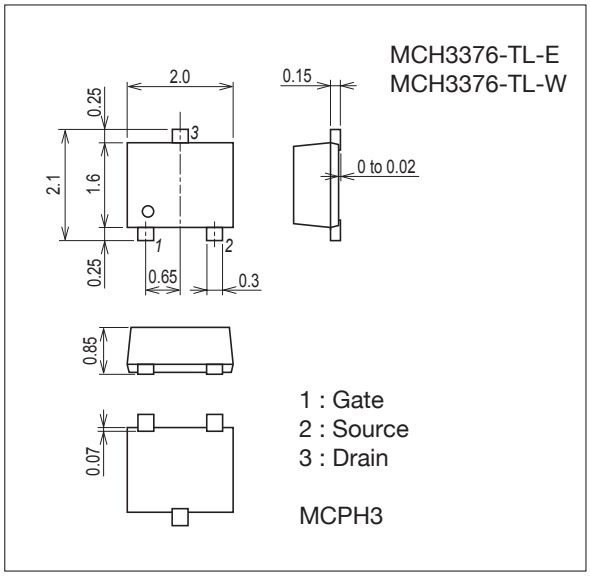
Absolute Maximum Ratings at Ta=25°C

Parameter	Symbol	Conditions	Ratings	Unit
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)	I_{DP}	PW≤10μs, duty cycle≤1%	−6	A
Power Dissipation	P_D	When mounted on ceramic substrate (900mm²×0.8mm)	0.8	W
Junction Temperature	Tj		150	°C
Storage Temperature	Tstg		−55 to +150	°C

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.

Package Dimensions

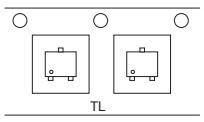
unit : mm (typ)
7019A-003



Product & Package Information

- Package : MCPH3
- JEITA, JEDEC : SC-70, SOT-323
- Minimum Packing Quantity : 3,000 pcs./reel

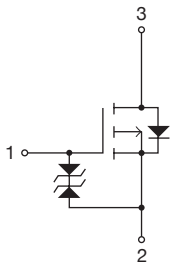
Packing Type: TL



Marking



Electrical Connection



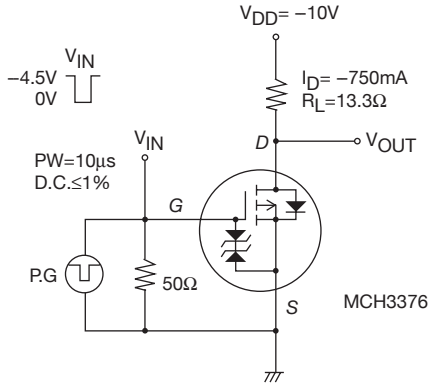
ORDERING INFORMATION
See detailed ordering and shipping information on page 2 of this data sheet.

Electrical Characteristics at Ta=25°C

Parameter	Symbol	Conditions	Ratings			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}=±8V, V_{DS}=0V			±10	μA
Gate Threshold Voltage	$V_{GS}(th)$	V_{DS}=−10V, I_D=−1mA	−0.4		−1.4	V
Forward Transconductance	g_{FS}	V_{DS}=−10V, I_D=−750mA	1.14	1.9		S
Static Drain-to-Source On-State Resistance	$R_{DS}(on)1$	I_D=−750mA, V_{GS}=−4.5V		185	241	mΩ
	$R_{DS}(on)2$	I_D=−300mA, V_{GS}=−2.5V		275	385	mΩ
	$R_{DS}(on)3$	I_D=−100mA, V_{GS}=−1.8V		410	615	mΩ
Input Capacitance	Ciss	V_{DS}=−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	V_{DS}=−10V, V_{GS}=−4.5V, I_D=−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	V_{SD}	I_S=−1.5A, V_{GS}=0V		−0.89	−1.2	V

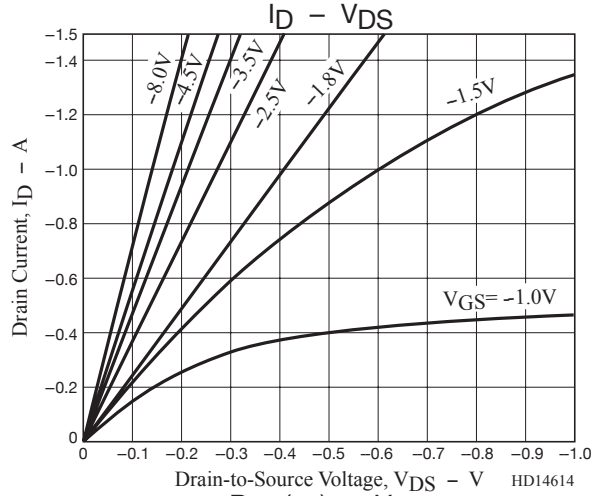
Product parametric performance is indicated in the Electrical Characteristics for the listed test conditions, unless otherwise noted. Product performance may not be indicated by the Electrical Characteristics if operated under different conditions.

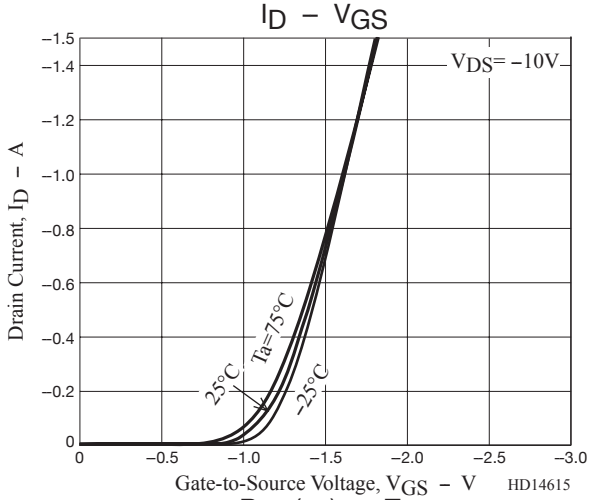
Switching Time Test Circuit

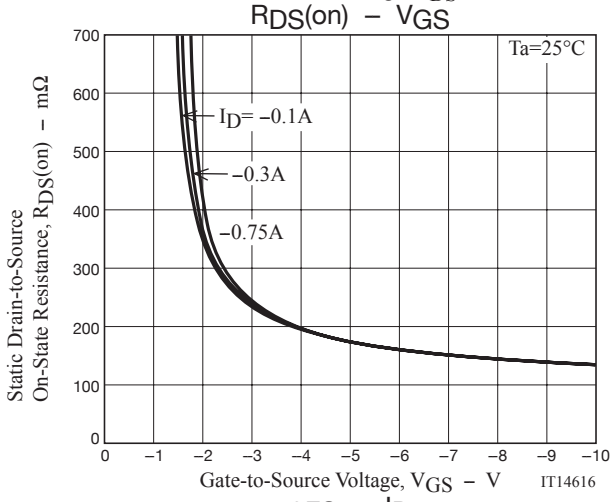


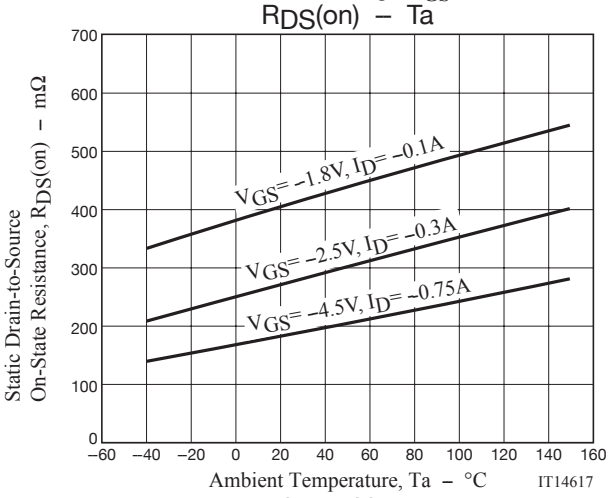
Ordering Information

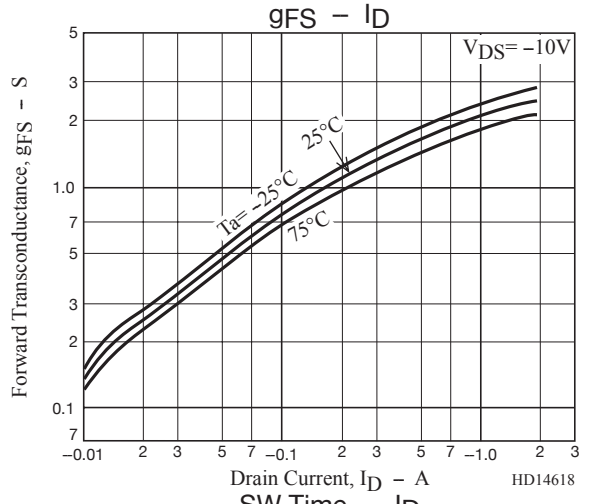
Device	Package	Shipping	memo
MCH3376-TL-E	MCPH3	3,000pcs./reel	Pb-Free
MCH3376-TL-W			Pb-Free and Halogen Free

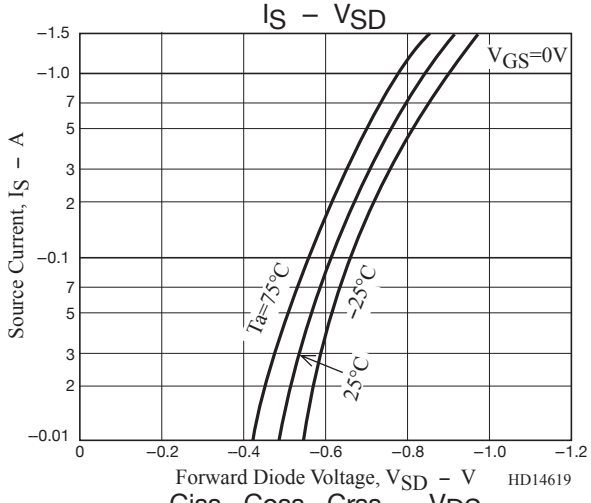

ID – VDS
Drain Current, ID – A
Drain-to-Source Voltage, VDS – V
HD14614
–8.0V
–4.5V
–3.5V
–2.5V
–1.8V
–1.5V
VGS= –1.0V

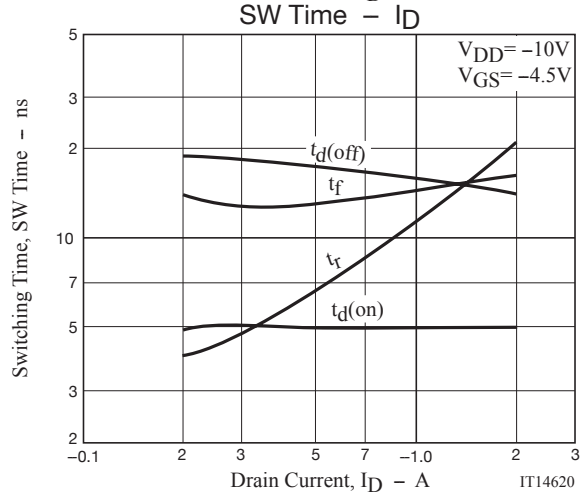

ID – VGS
Drain Current, ID – A
Gate-to-Source Voltage, VGS – V
HD14615
VDS= –10V
25°C
Ta=75°C
–25°C

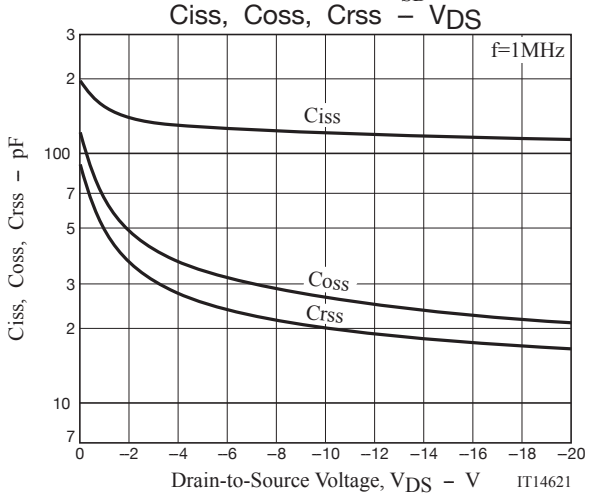

RDS(on) – VGS
Static Drain-to-Source On-State Resistance, RDS(on) – mΩ
Gate-to-Source Voltage, VGS – V
IT14616
Ta=25°C
ID= –0.1A
–0.3A
–0.75A

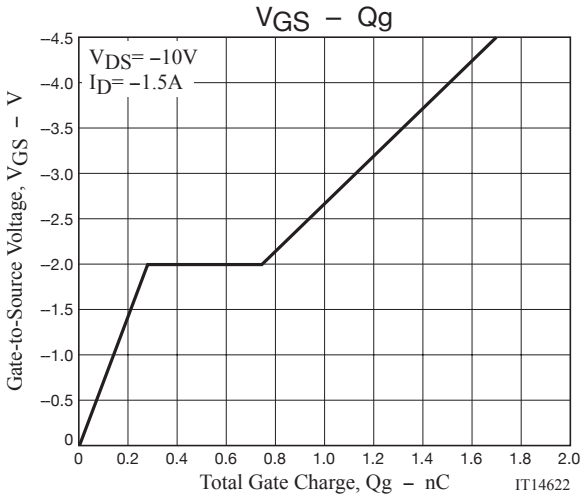

RDS(on) – Ta
Static Drain-to-Source On-State Resistance, RDS(on) – mΩ
Ambient Temperature, Ta – °C
IT14617
VGS= –1.8V, ID= –0.1A
VGS= –2.5V, ID= –0.3A
VGS= –4.5V, ID= –0.75A

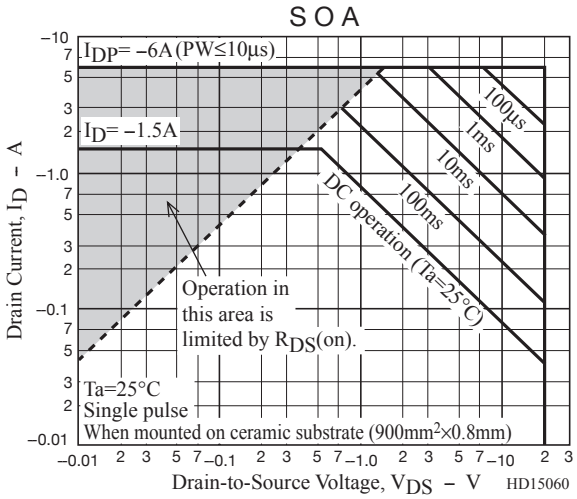

gFS – ID
Forward Transconductance, gFS – S
Drain Current, ID – A
HD14618
VDS= –10V
25°C
Ta= –25°C
75°C

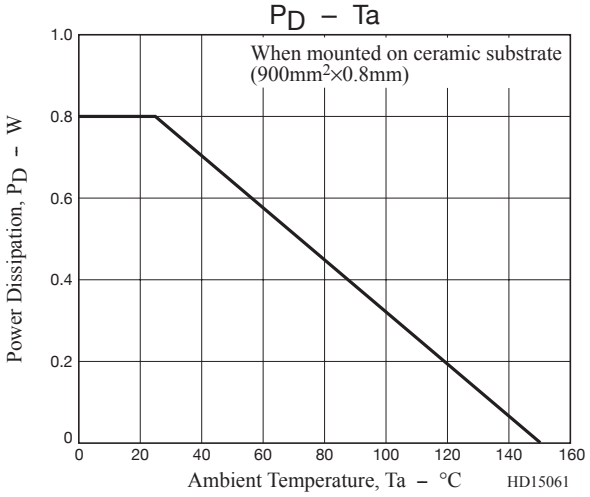

IS – VSD
Source Current, IS – A
Forward Diode Voltage, VSD – V
HD14619
VGS=0V
Ta=75°C
–25°C
25°C


SW Time – ID
Switching Time, SW Time – ns
Drain Current, ID – A
IT14620
VDD= –10V
VGS= –4.5V
td(off)
tf
tr
td(on)


Ciss, Coss, Crss – VDS
Ciss, Coss, Crss – pF
Drain-to-Source Voltage, VDS – V
IT14621
f=1MHz
Ciss
Coss
Crss

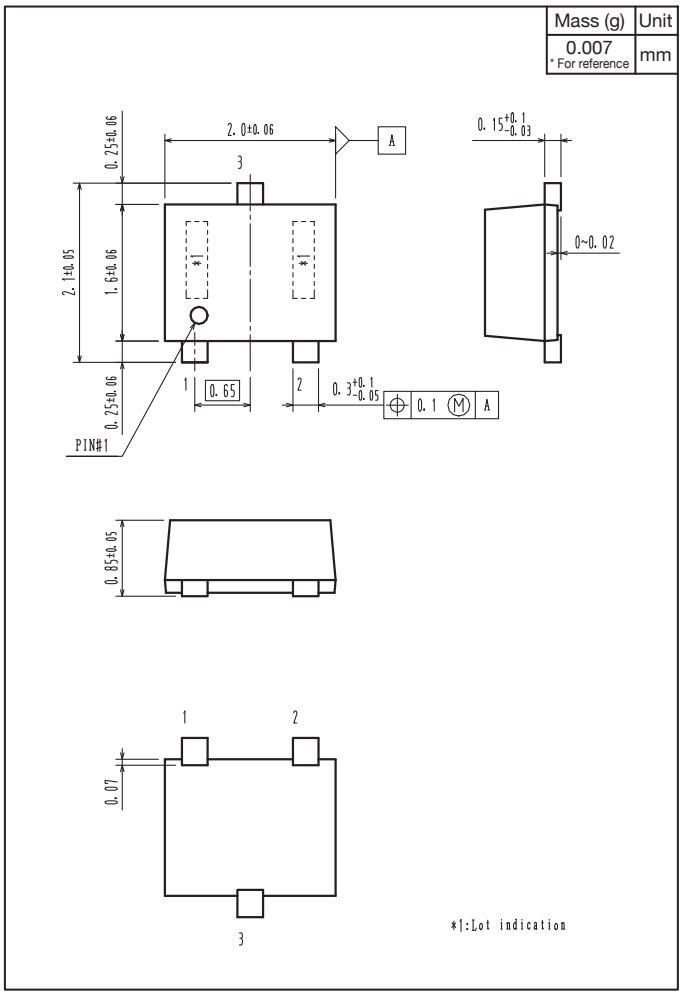

VGS – Qg
VDS= –10V
ID= –1.5A
Gate-to-Source Voltage, VGS – V
Total Gate Charge, Qg – nC
IT14622


S O A
IDP= –6A (PW≤10μs)
ID= –1.5A
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 (900mm2×0.8mm)
Drain Current, ID – A
Drain-to-Source Voltage, VDS – V
HD15060

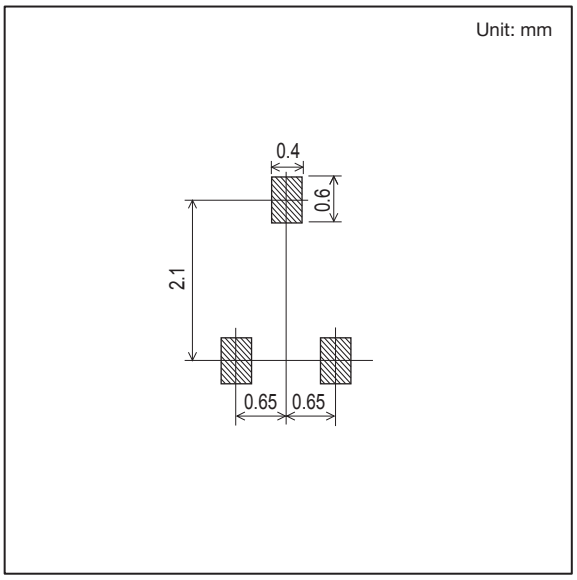

PD – Ta
When mounted on ceramic substrate (900mm2×0.8mm)
Power Dissipation, PD – W
Ambient Temperature, Ta – °C
HD15061

Outline Drawing

MCH3376-TL-E, MCH3376-TL-W



Land Pattern Example



Note on usage : Since the MCH3376 is a MOSFET product, please avoid using this device in the vicinity of highly charged objects.

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