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MCH3477

Power MOSFET 20V, 38mΩ, 4.5A, Single N-Channel

Features

- High Speed Switching
- 1.8V Drive
- ESD Diode - Protected Gate
- Low On-Resistance
- Pb-Free, Halogen Free and RoHS Compliance

| V _{DSS} | R _{DS(on)} Max | I _D Max |
|------------------|-------------------------|--------------------|
| 20V | 38 mΩ@4.5V | 4.5A |
| | 61 mΩ@2.5V | |
| | 99 mΩ@1.8V | |

Specifications

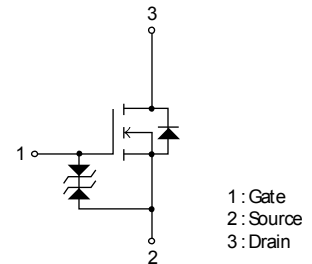
Absolute Maximum Ratings at T_a = 25°C

| Parameter | Symbol | Value | Unit |
|---|------------------|-------------|------|
| Drain to Source Voltage | V _{DSS} | 20 | V |
| Gate to Source Voltage | V _{GSS} | ±12 | V |
| Drain Current (DC) | I _D | 4.5 | A |
| Drain Current (Pulse) PW≤10μs, duty cycle≤1% | I _{DP} | 18 | A |
| Power Dissipation When mounted on ceramic substrate (900mm ² ×0.8mm) | P _D | 1.0 | W |
| Junction Temperature | T _J | 150 | °C |
| Storage Temperature | T _{stg} | -55 to +150 | °C |

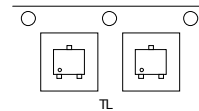
Thermal Resistance Ratings

| Parameter | Symbol | Value | Unit |
|---|------------------|-------|------|
| Junction to Ambient When mounted on ceramic substrate (900mm ² ×0.8mm) | R _{θJA} | 125 | °C/W |

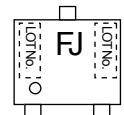
Electrical Connection N-Channel



Packing Type:TL



Marking



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.

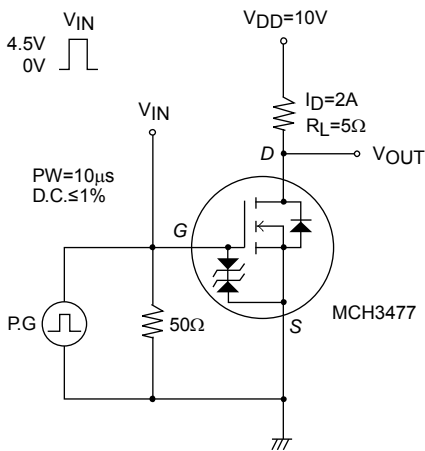
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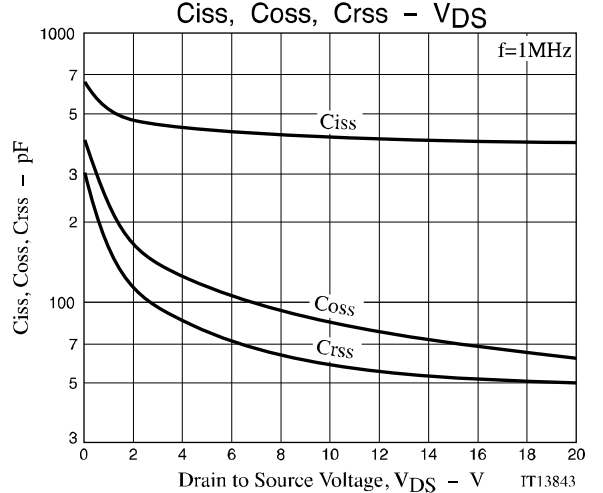
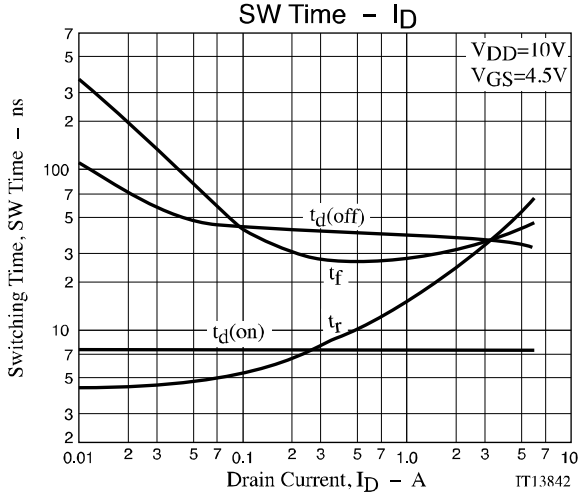
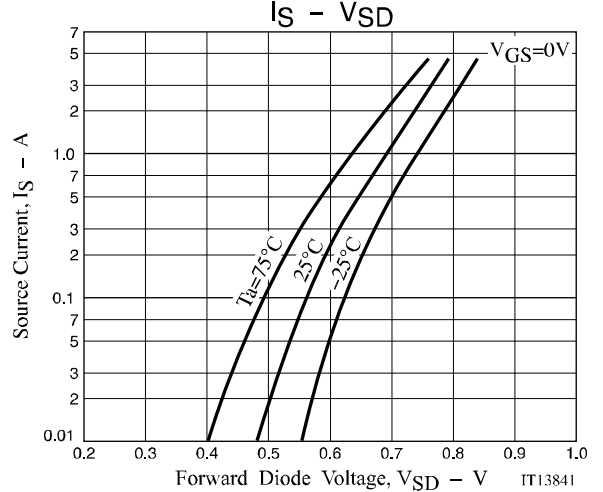
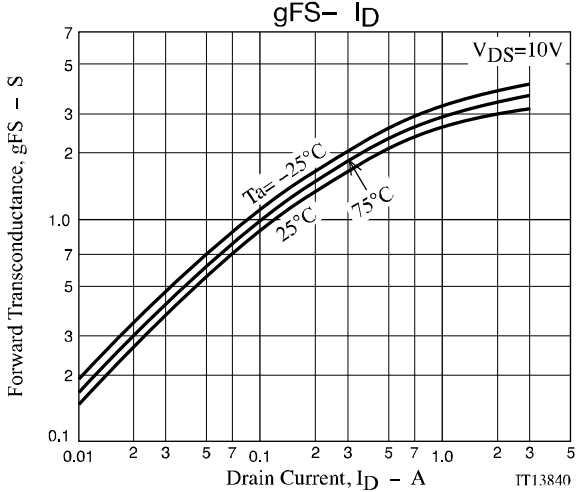
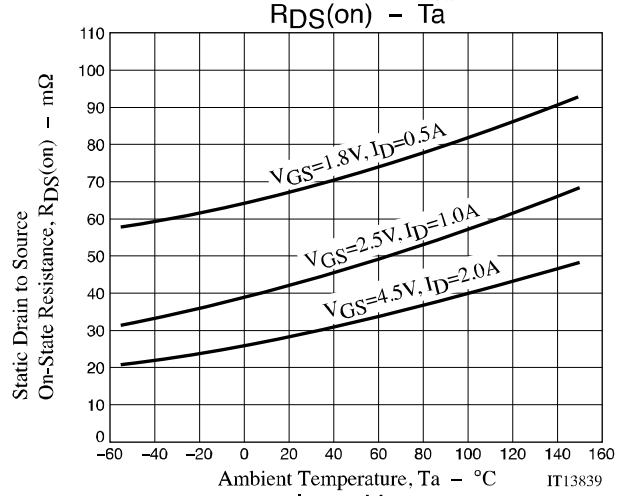
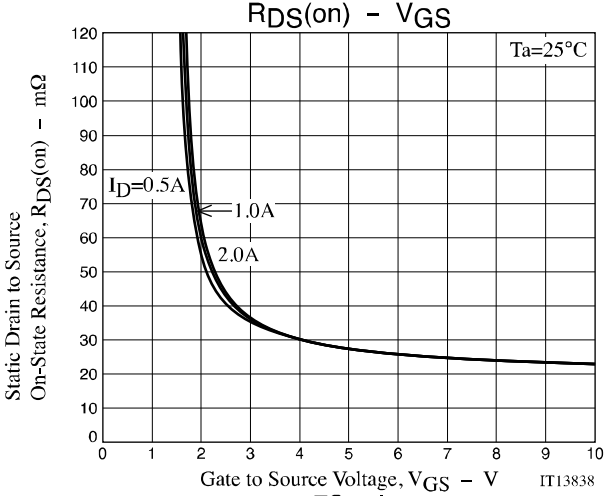
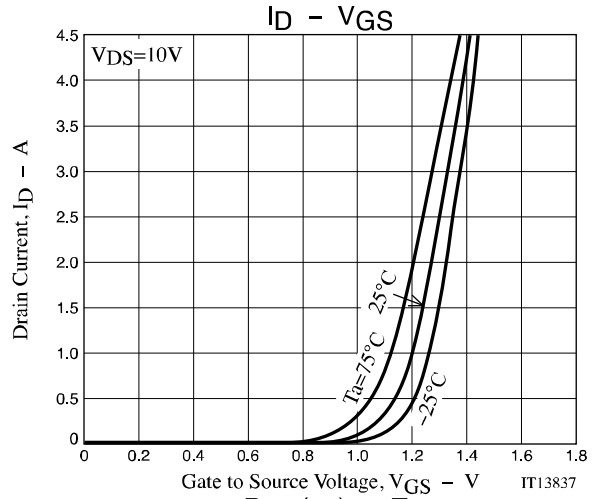
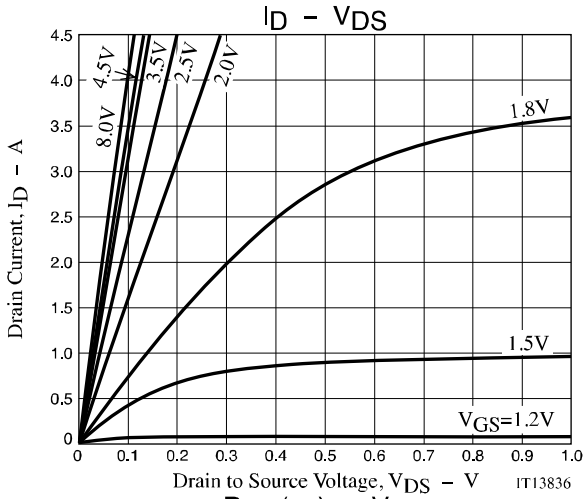
Electrical Characteristics at $T_a = 25^\circ\text{C}$

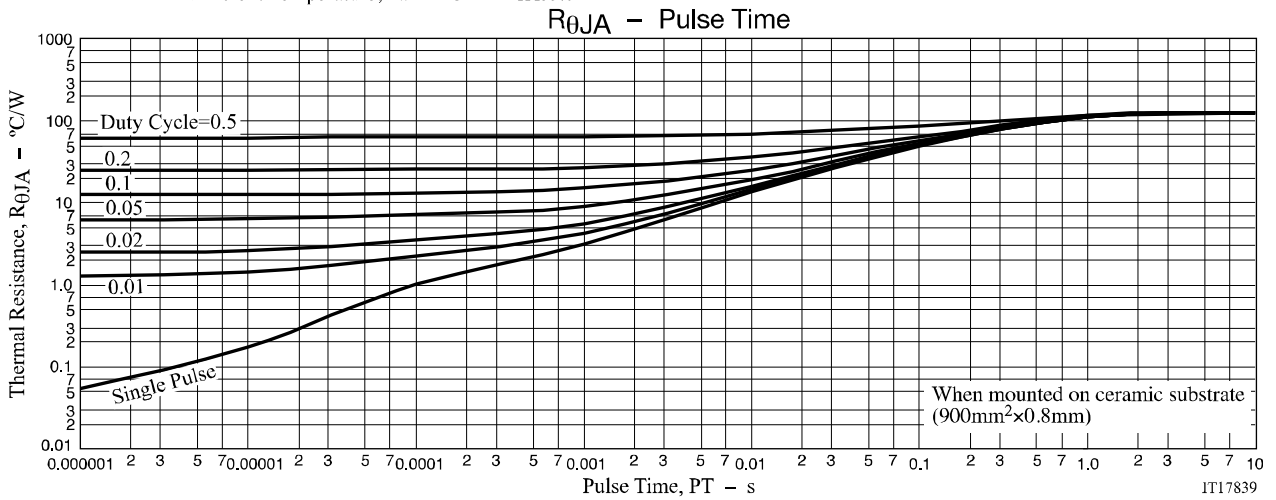
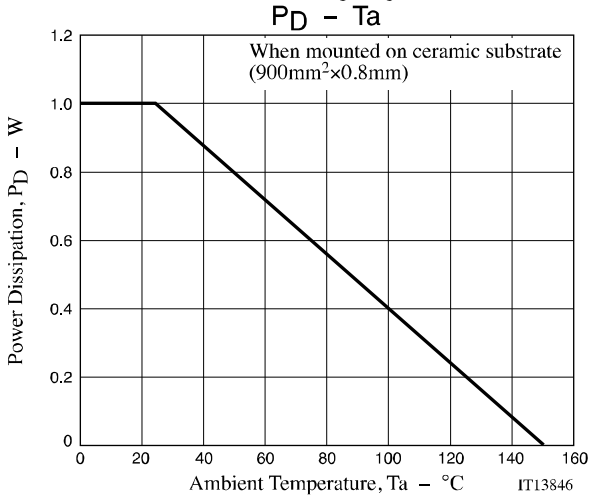
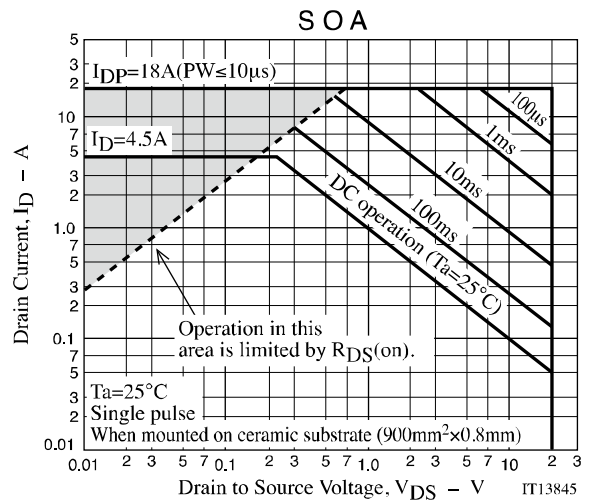
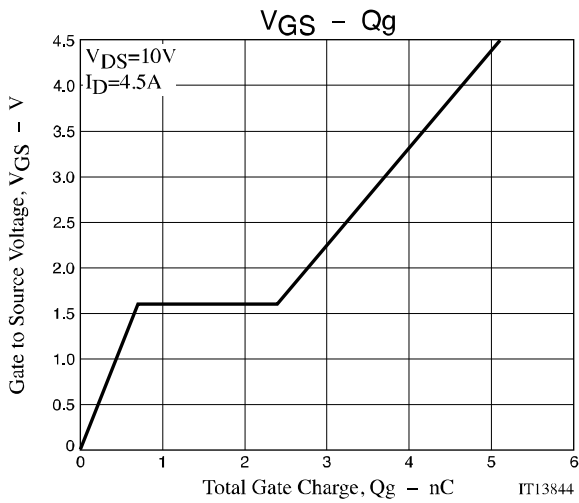
| Parameter | Symbol | Conditions | Value | | | Unit |
|--|---------------|--|--|------|----------|------------------|
| | | | min | typ | max | |
| Drain to Source Breakdown Voltage | $V_{(BR)DSS}$ | $I_D=1\text{mA}, V_{GS}=0\text{V}$ | 20 | | | V |
| Zero-Gate Voltage Drain Current | I_{DSS} | $V_{DS}=20\text{V}, V_{GS}=0\text{V}$ | | | 1 | μA |
| Gate to Source Leakage Current | I_{GSS} | $V_{GS}=\pm 8\text{V}, V_{DS}=0\text{V}$ | | | ± 10 | μA |
| Gate Threshold Voltage | $V_{GS(th)}$ | $V_{DS}=10\text{V}, I_D=1\text{mA}$ | 0.4 | | 1.3 | V |
| Forward Transconductance | g_{FS} | $V_{DS}=10\text{V}, I_D=2\text{A}$ | 2.0 | 3.4 | | S |
| Static Drain to Source On-State Resistance | $R_{DS(on)1}$ | $I_D=2\text{A}, V_{GS}=4.5\text{V}$ | | 29 | 38 | $\text{m}\Omega$ |
| | $R_{DS(on)2}$ | $I_D=1\text{A}, V_{GS}=2.5\text{V}$ | | 43 | 61 | $\text{m}\Omega$ |
| | $R_{DS(on)3}$ | $I_D=0.5\text{A}, V_{GS}=1.8\text{V}$ | | 69 | 99 | $\text{m}\Omega$ |
| Input Capacitance | C_{iss} | $V_{DS}=10\text{V}, f=1\text{MHz}$ | | 410 | | pF |
| Output Capacitance | C_{oss} | | | 84 | | pF |
| Reverse Transfer Capacitance | C_{rss} | | | 59 | | pF |
| Turn-ON Delay Time | $t_{d(on)}$ | See specified Test Circuit | | 7.5 | | ns |
| Rise Time | t_r | | | 26 | | ns |
| Turn-OFF Delay Time | $t_{d(off)}$ | | | 38 | | ns |
| Fall Time | t_f | | | 32 | | ns |
| Total Gate Charge | Q_g | | $V_{DS}=10\text{V}, V_{GS}=4.5\text{V}, I_D=4.5\text{A}$ | | 5.1 | |
| Gate to Source Charge | Q_{gs} | | | 0.7 | | nC |
| Gate to Drain "Miller" Charge | Q_{gd} | | | 1.7 | | nC |
| Forward Diode Voltage | V_{SD} | $I_S=4.5\text{A}, V_{GS}=0\text{V}$ | | 0.78 | 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







MCH3477

Package Dimensions

MCH3477-TL-H / MCH3477-TL-W

MCPH3

CASE 419AQ

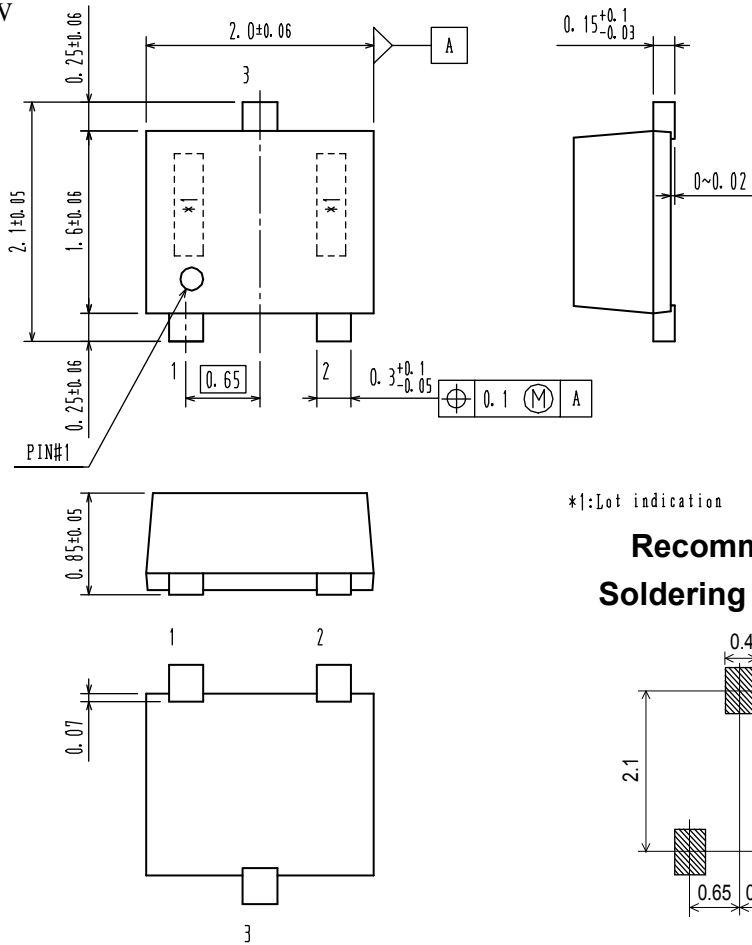
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Unit : mm

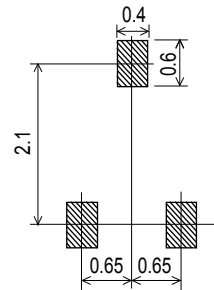
1 : Gate

2 : Source

3 : Drain



Recommended Soldering Footprint



ORDERING INFORMATION

| Device | Package | Shipping | Note |
|--------------|------------------------|-------------------|-----------------------------|
| MCH3477-TL-H | MCPH3 SC-70,SOT-323 | 3,000 pcs. / reel | Pb-Free and Halogen Free |
| MCH3477-TL-W | | | |

Note on usage : Since the MCH3477 is a MOSFET product, please avoid using this device in the vicinity of highly charged objects.

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