

MCH6660



Power MOSFET

20V, 136mΩ, 2A, -20V, 266mΩ, -1.5A Complementary Dual

ON Semiconductor®

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Features

- ON-resistance Nch : $R_{DS(on)1}=105m\Omega$ (typ.)
Pch : $R_{DS(on)1}=205m\Omega$ (typ.)
- 1.8V Drive
- Pb-Free, Halogen Free and RoHS Compliance
- ESD Diode - Protected Gate
- Ultrasmall Package MCPH6(2.0mm×2.1mm×0.85mm)
- Nch MOSFET and Pch MOSFET are put in MCPH6 Package

Applications

- General-Purpose Switching Device Applications

Specifications

Absolute Maximum Ratings at $T_a=25^\circ C$

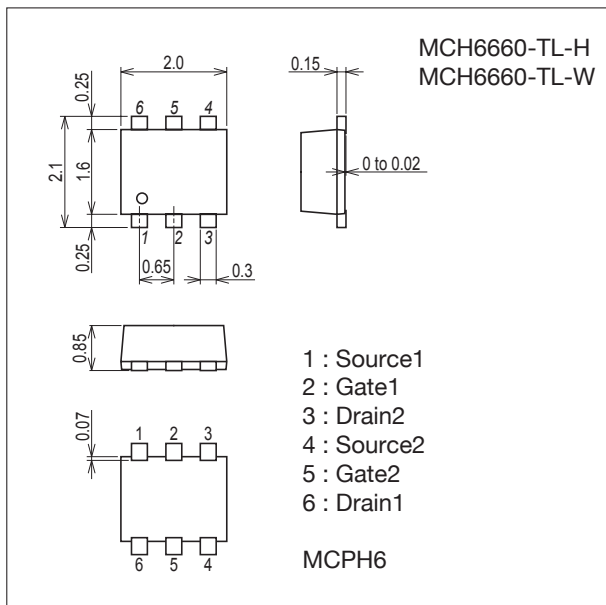
| Parameter | Symbol | Conditions | N-channel | P-channel | Unit |
|-------------------------|-----------|---|-------------|-----------|------|
| Drain-to-Source Voltage | V_{DSS} | | 20 | -20 | V |
| Gate-to-Source Voltage | V_{GSS} | | ± 10 | ± 10 | V |
| Drain Current (DC) | I_D | | 2 | -1.5 | A |
| Drain Current (Pulse) | I_{DP} | $PW \leq 10\mu s$, duty cycle $\leq 1\%$ | 8 | -6 | A |
| Power Dissipation | P_D | When mounted on ceramic substrate (900mm ² ×0.8mm) 1unit | 0.8 | | W |
| Junction Temperature | T_j | | 150 | | °C |
| Storage Temperature | T_{stg} | | -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)

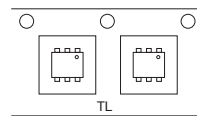
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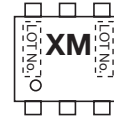
Product & Package Information

- Package : MCPH6
- JEITA, JEDEC : SC-88, SC-70-6, SOT-363
- Minimum Packing Quantity : 3,000 pcs./reel

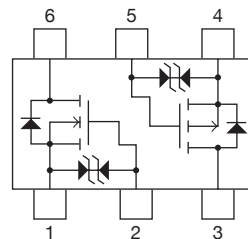
Packing Type : TL



Marking



Electrical Connection



ORDERING INFORMATION

See detailed ordering and shipping information on page 8 of this data sheet.

MCH6660

Electrical Characteristics at Ta=25°C

| Parameter | Symbol | Conditions | Value | | | Unit |
|--|---------------------|-------------------------------|-----------------------------|------|-------|------|
| | | | min | typ | max | |
| [N-channel] | | | | | | |
| 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 | | 1.3 | V |
| Forward Transconductance | gFS | VDS=10V, ID=1A | | 1.9 | | S |
| Static Drain-to-Source On-State Resistance | RDS(on)1 | ID=1A, VGS=4.5V | | 105 | 136 | mΩ |
| | RDS(on)2 | ID=0.5A, VGS=2.5V | | 147 | 205 | mΩ |
| | RDS(on)3 | ID=0.3A, VGS=1.8V | | 212 | 318 | mΩ |
| Input Capacitance | Ciss | VDS=10V, f=1MHz | | 128 | | pF |
| Output Capacitance | Coss | | | 28 | | pF |
| Reverse Transfer Capacitance | Crss | | | 21 | | pF |
| Turn-ON Delay Time | t _{d(on)} | | See specified Test Circuit. | | 5.1 | |
| Rise Time | t _r | | | 11 | | ns |
| Turn-OFF Delay Time | t _{d(off)} | | | 14.5 | | ns |
| Fall Time | t _f | | | 12 | | ns |
| Total Gate Charge | Qg | VDS=10V, VGS=4.5V, ID=2A | | | 1.8 | |
| Gate-to-Source Charge | Qgs | | | 0.3 | | nC |
| Gate-to-Drain "Miller" Charge | Qgd | | | 0.55 | | nC |
| Forward Diode Voltage | VSD | | IS=2A, VGS=0V | | 0.85 | 1.2 |
| [P-channel] | | | | | | |
| 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 | |
| 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 | |
| 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 |

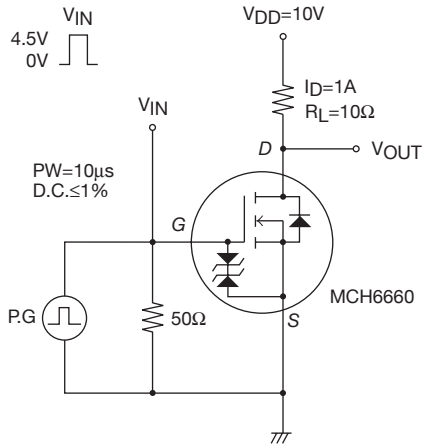
Product parametric performance is indicated in the Electrical Characteristics for the listed test conditions, unless otherwise noted. Product performance may not be indicated by the Electrical Characteristics if operated under different conditions.

Thermal Resistance Ratings

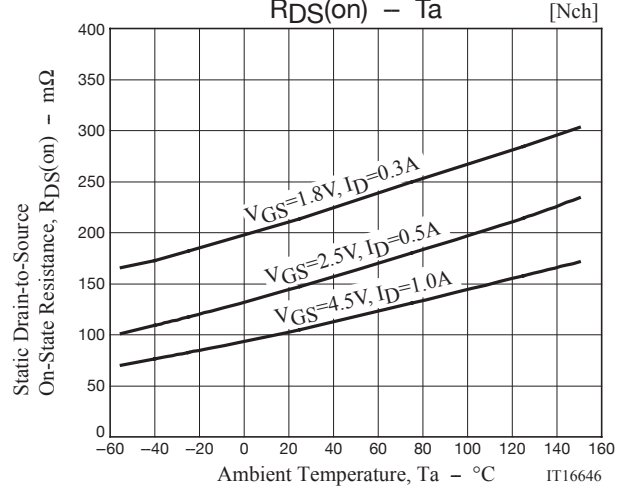
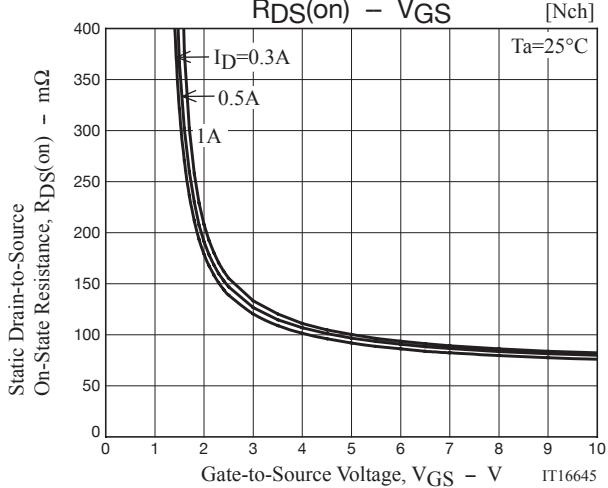
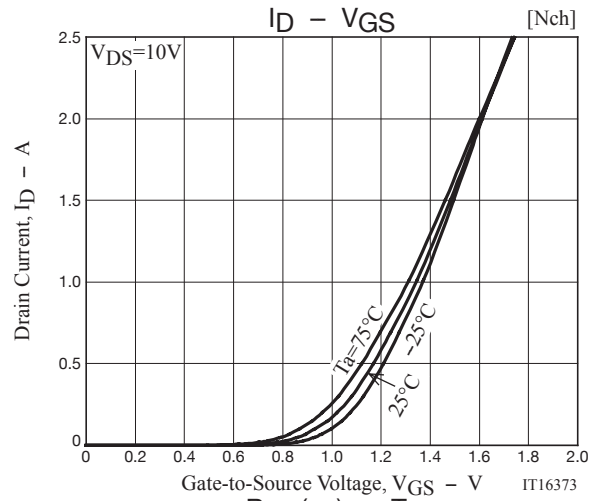
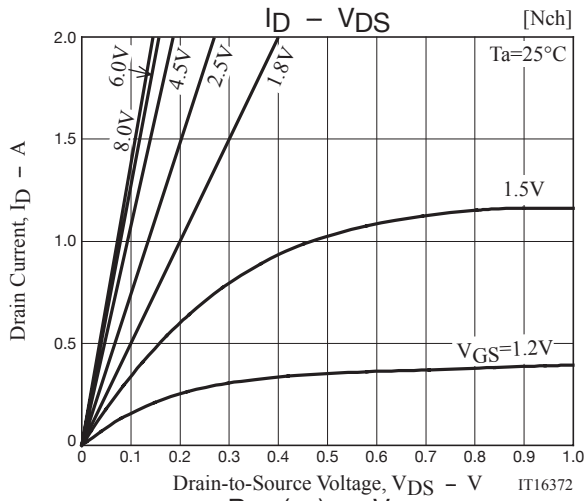
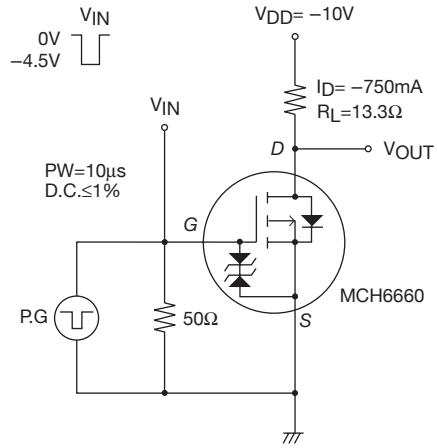
| Parameter | Symbol | Value | Unit |
|--|------------------|-------|------|
| Junction to Ambient When mounted on ceramic substrate (900mm ² ×0.8mm) 1unit | R _{θJA} | 156.3 | °C/W |

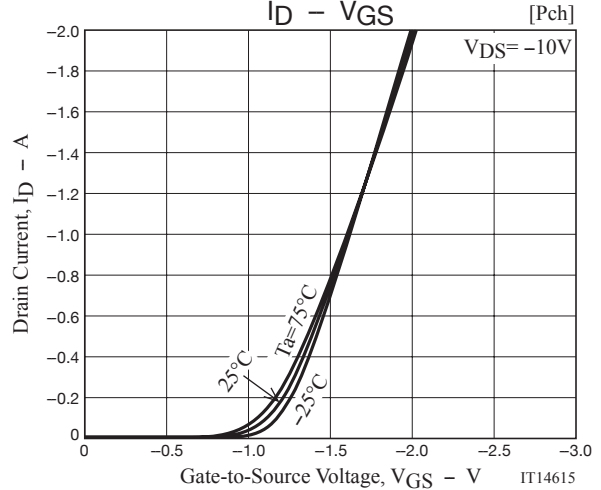
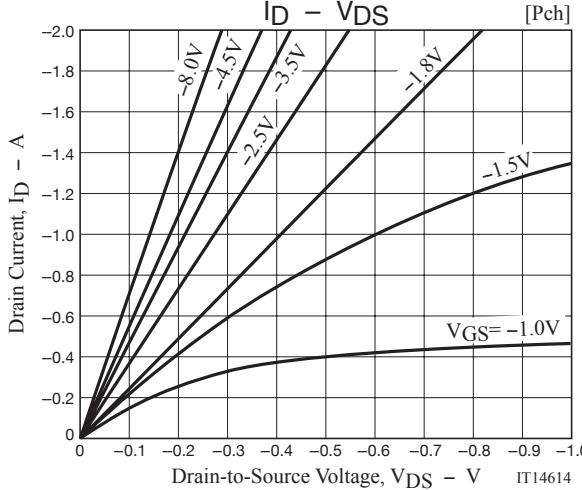
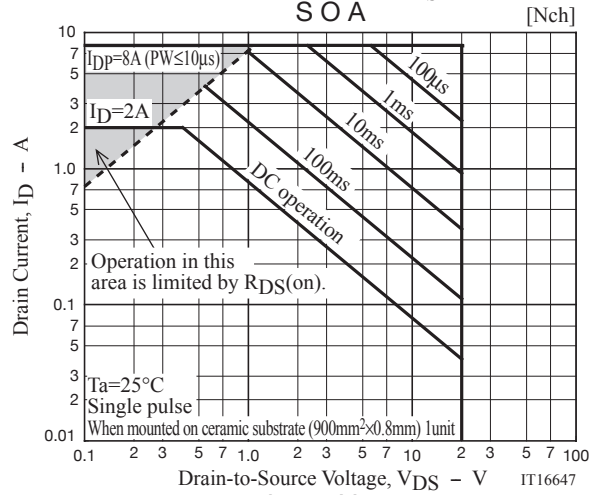
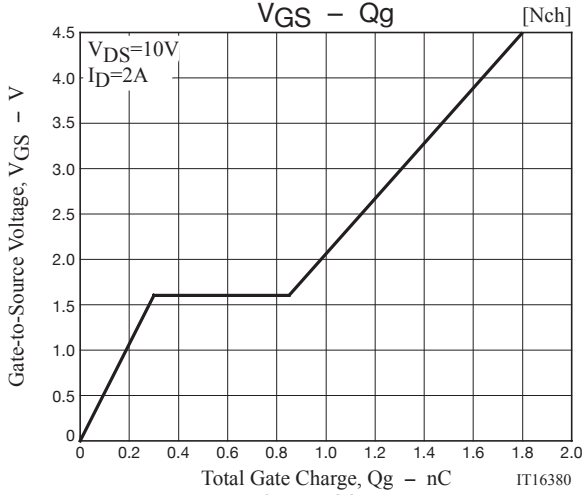
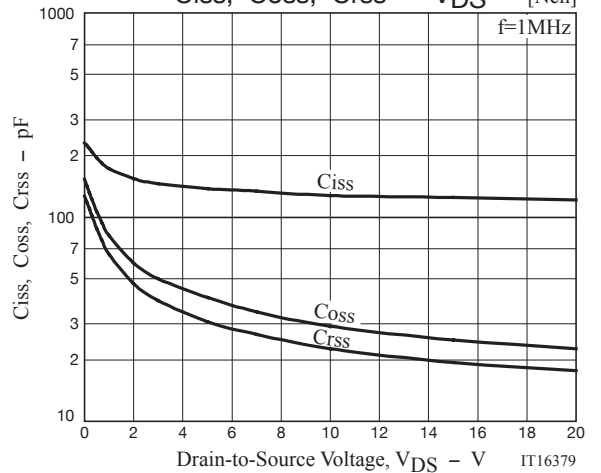
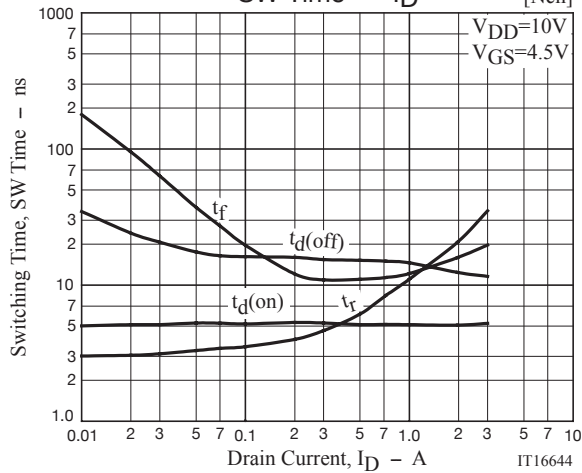
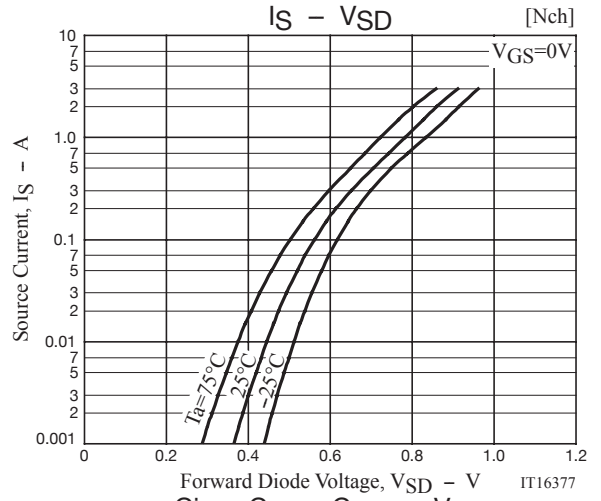
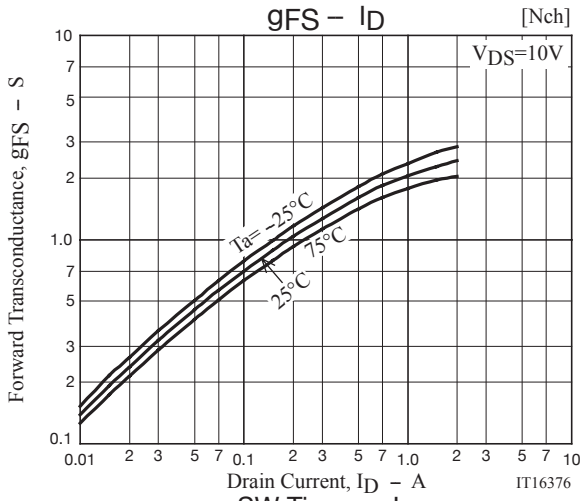
Switching Time Test Circuit

[N-channel]

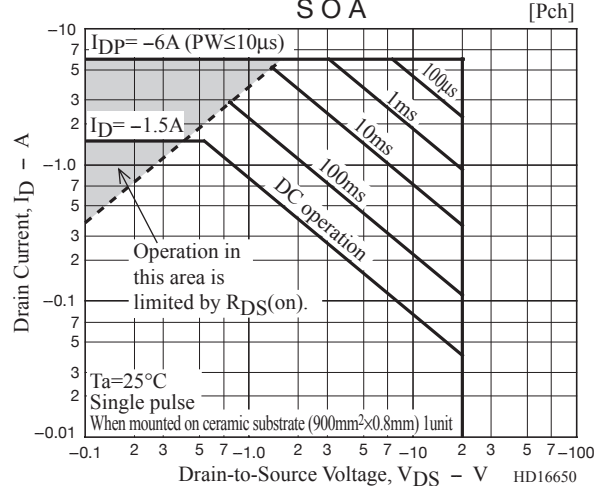
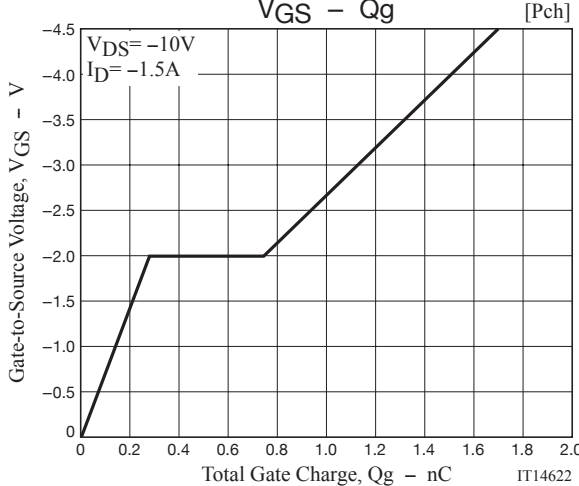
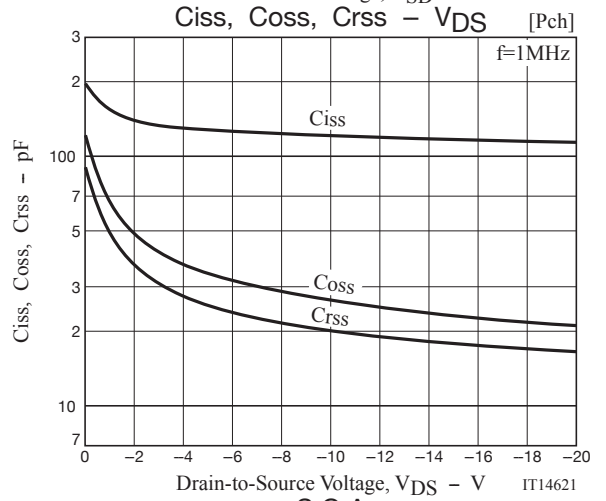
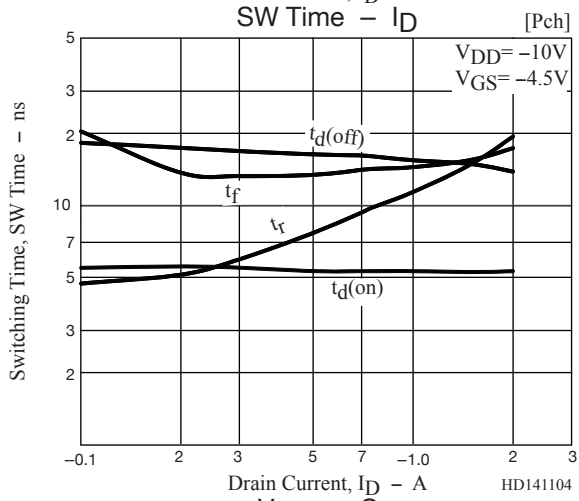
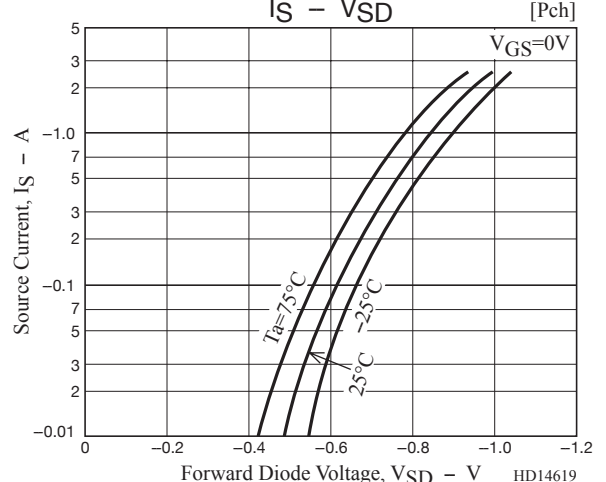
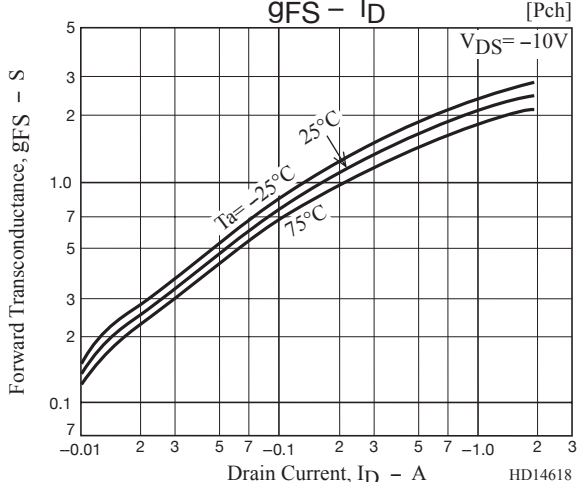
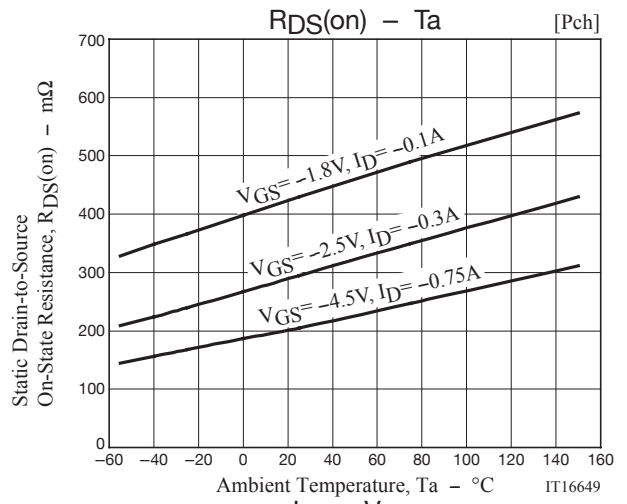
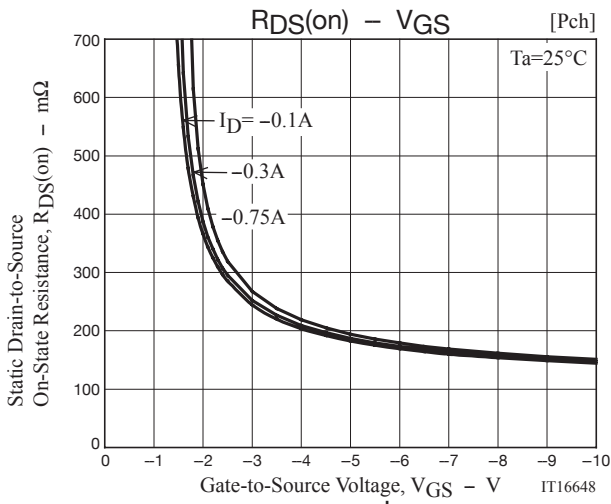


[P-channel]

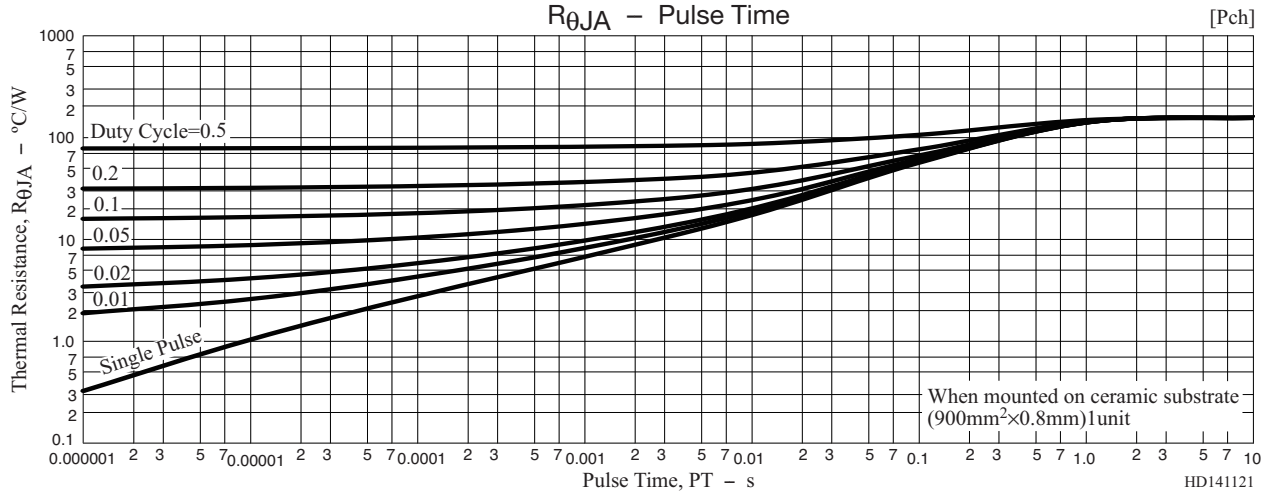
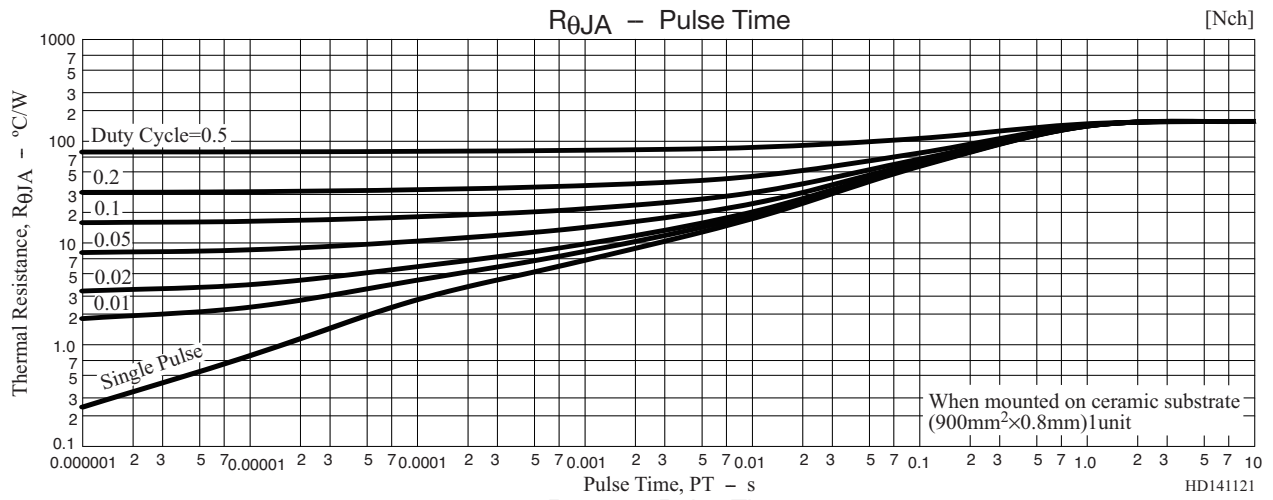
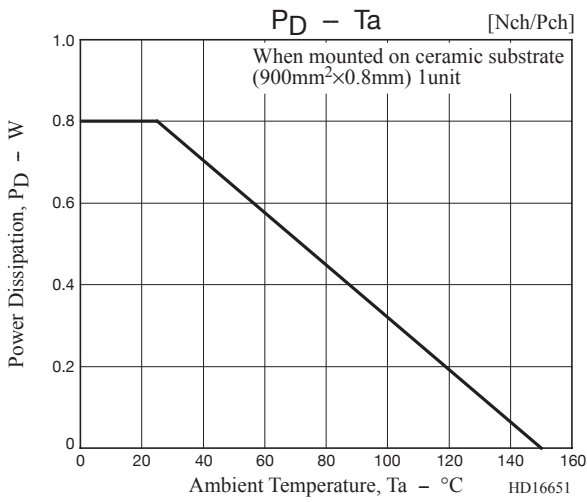




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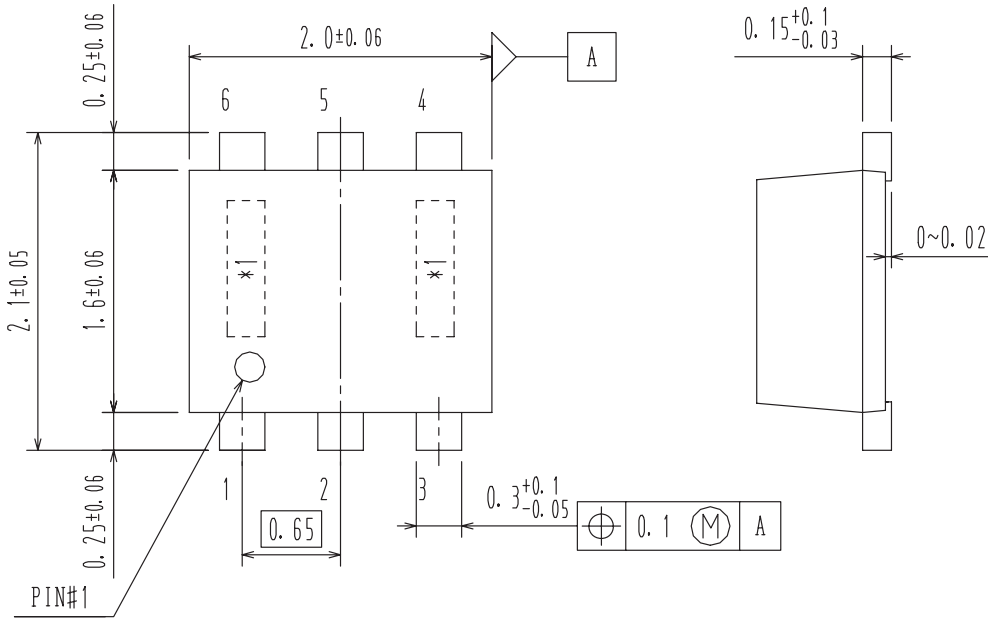
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Package Dimensions

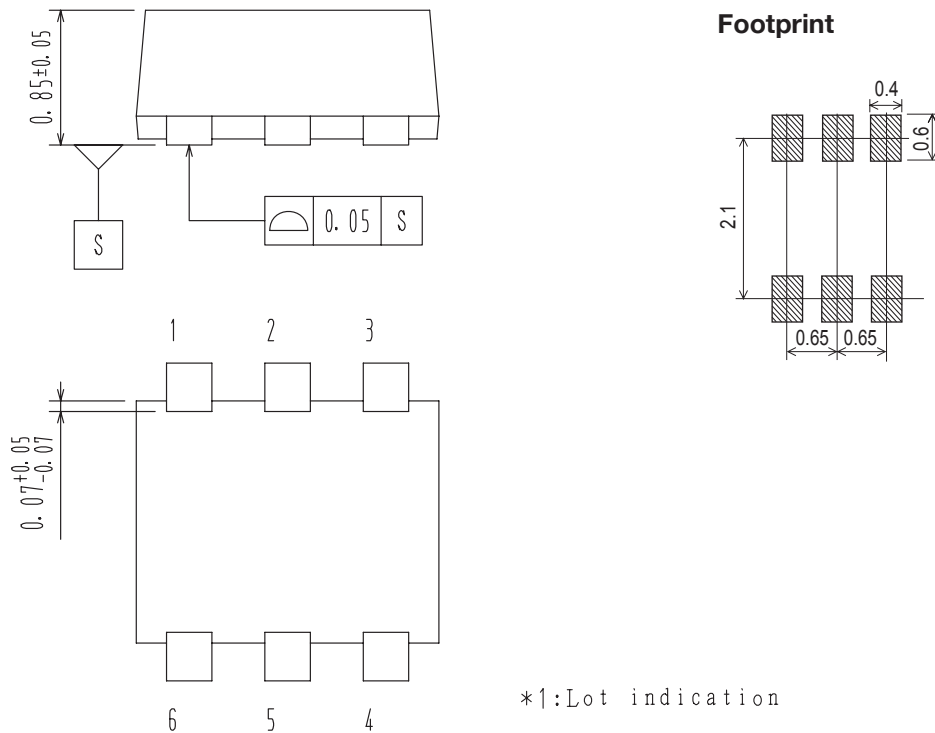
unit : mm

MCH6660-TL-H, MCH6660-TL-W

SC-88FL / MCPH6
CASE 419AS
ISSUE O



Recommended Soldering Footprint



*1: Lot indication

MCH6660

ORDERING INFORMATION

| Device | Package | Shipping | memo |
|--------------|---------|----------------|--------------------------|
| MCH6660-TL-H | MCPH6 | 3,000pcs./reel | Pb-Free and Halogen Free |
| MCH6660-TL-W | | | |

Note on usage : Since the MCH6660 is a MOSFET product, please avoid using this device in the vicinity of highly charged objects.

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