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# MCH6662

## Power MOSFET
## 20V, 160mΩ, 2A, Dual N-Channel

ON Semiconductor®

www.onsemi.com

### Features

- ON-Resistance Nch : $R_{DS}(on)1$=120mΩ (typ)
- 1.8V Drive
- ESD Diode - Protected Gate
- Pb-Free, Halogen Free and RoHS Compliance

### Specifications

#### Absolute Maximum Ratings at Ta=25°C

| Parameter | Symbol | Conditions | Value | Unit |
|---|---|---|---|---|
| Drain-to-Source Voltage | $V_{DSS}$ | | 20 | V |
| Gate-to-Source Voltage | $V_{GSS}$ | | ±10 | V |
| Drain Current (DC) | $I_D$ | | 2.0 | A |
| Drain Current (Pulse) | $I_{DP}$ | PW≤10μs, duty cycle≤1% | 8.0 | A |
| Power Dissipation | $P_D$ | When mounted on ceramic substrate (900mm$^2$×0.8mm) 1unit | 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.

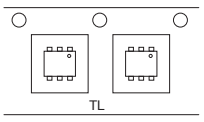
#### Thermal Resistance Ratings

| Parameter | Symbol | Value | Unit |
|---|---|---|---|
| Junction to Ambient<br>When mounted on ceramic substrate (900mm$^2$×0.8mm) 1unit | $R_{\theta JA}$ | 156.25 | °C/W |

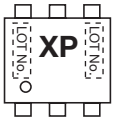
#### Product & Package Information

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

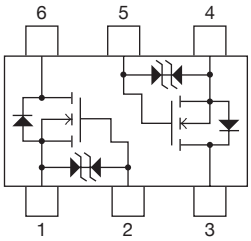
#### Packing Type : TL




#### Marking




#### Electrical Connection




**ORDERING INFORMATION**

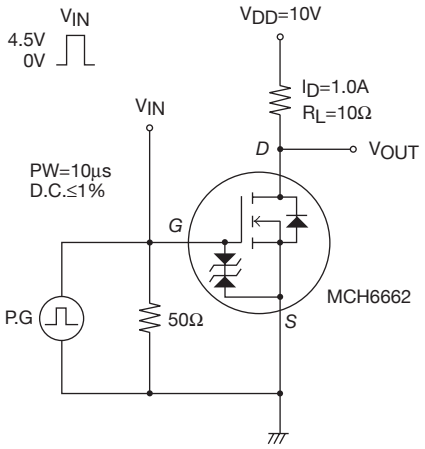
See detailed ordering and shipping information on page 6 of this data sheet.

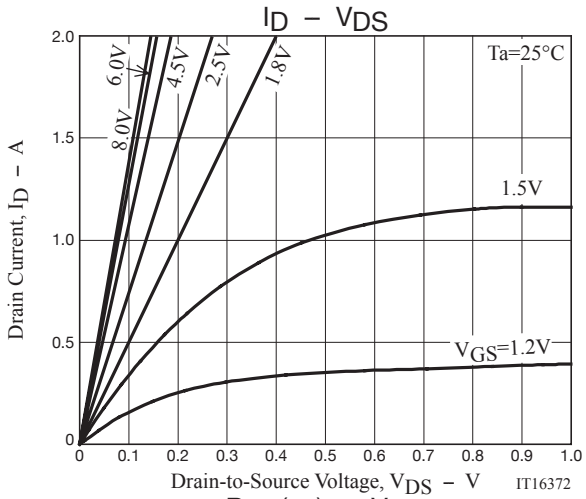
## Electrical Characteristics at Ta=25°C

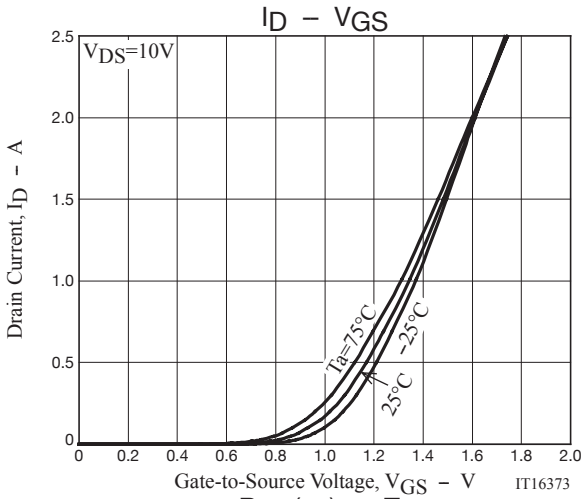
| Parameter | Symbol | Conditions | Value | | | Unit |
|---|---|---|---|---|---|---|
| | | | min | typ | max | |
| Drain-to-Source Breakdown Voltage | $V_{(BR)DSS}$ | $I_D$=1mA, $V_{GS}$=0V | 20 | | | V |
| Zero-Gate Voltage Drain Current | $I_{DSS}$ | $V_{DS}$=20V, $V_{GS}$=0V | | | 1 | μA |
| Gate-to-Source 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 | | 1.3 | V |
| Forward Transconductance | $g_{FS}$ | $V_{DS}$=10V, $I_D$=1A | | 1.9 | | S |
| Static Drain-to-Source On-State Resistance | $R_{DS}(on)1$ | $I_D$=1.0A, $V_{GS}$=4.5V | | 120 | 160 | mΩ |
| | $R_{DS}(on)2$ | $I_D$=0.5A, $V_{GS}$=2.5V | | 170 | 240 | mΩ |
| | $R_{DS}(on)3$ | $I_D$=0.1A, $V_{GS}$=1.8V | | 255 | 380 | mΩ |
| Input Capacitance | Ciss | $V_{DS}$=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 | | ns |
| 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 | $V_{DS}$=10V, $V_{GS}$=4.5V, $I_D$=2A | | 1.8 | | nC |
| Gate-to-Source Charge | Qgs | | | 0.3 | | nC |
| Gate-to-Drain “Miller” Charge | Qgd | | | 0.55 | | nC |
| Forward Diode Voltage | $V_{SD}$ | $I_S$=2A, $V_{GS}$=0V | | 0.85 | 1.2 | V |

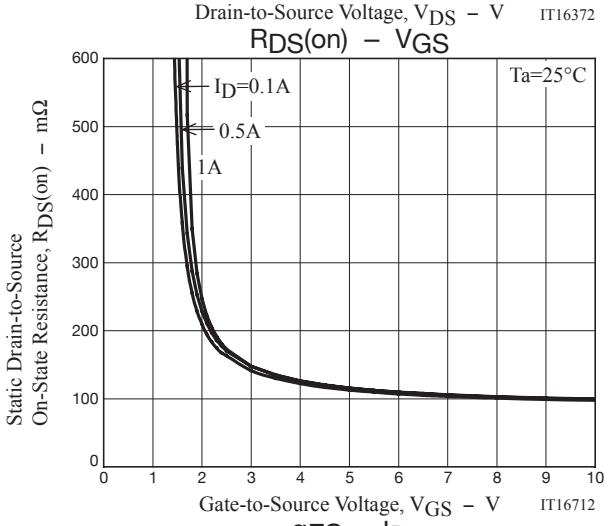
Product parametric performance is indicated in the Electrical Characteristics for the listed test conditions, unless otherwise noted. Product performance may not be indicated by the Electrical Characteristics if operated under different conditions.

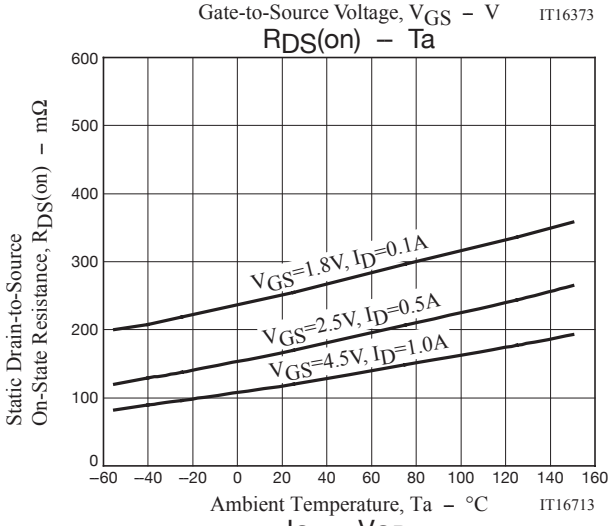
## Switching Time Test Circuit

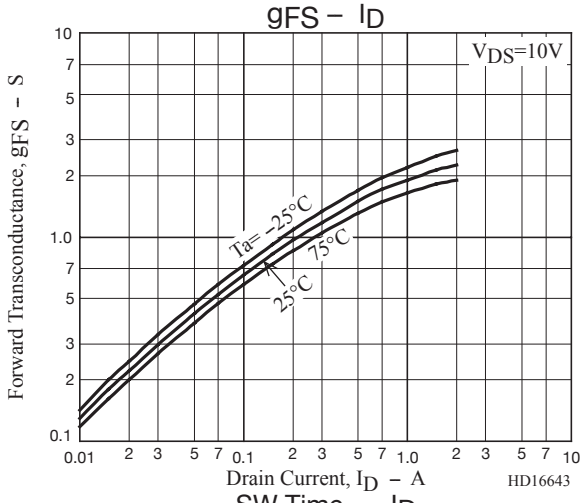


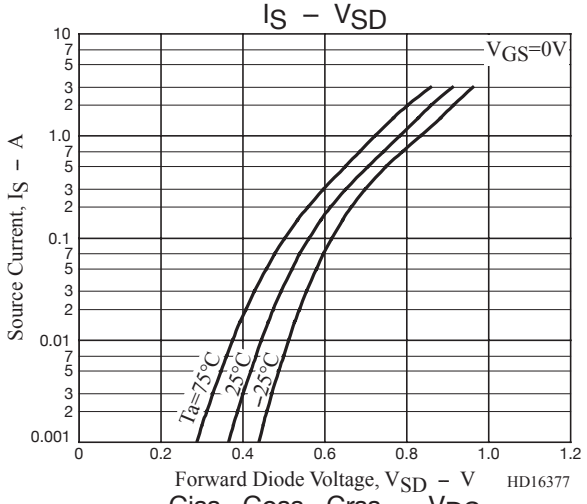

ID – VDS
Ta=25°C
6.0V
4.5V
2.5V
1.8V
8.0V
1.5V
VGS=1.2V
Drain Current, ID – A
Drain-to-Source Voltage, VDS – V
IT16372

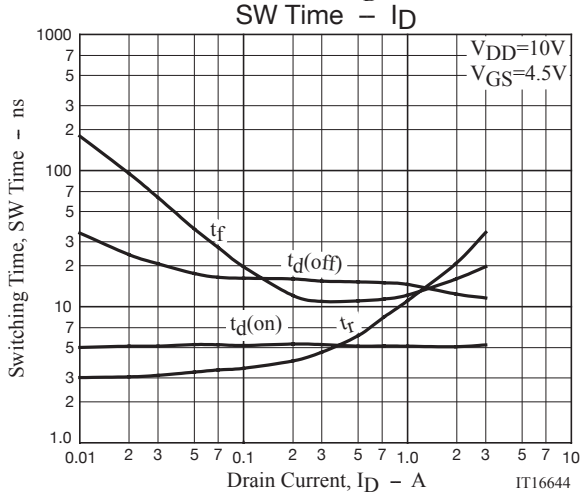

ID – VGS
VDS=10V
Ta=75°C
–25°C
25°C
Drain Current, ID – A
Gate-to-Source Voltage, VGS – V
IT16373

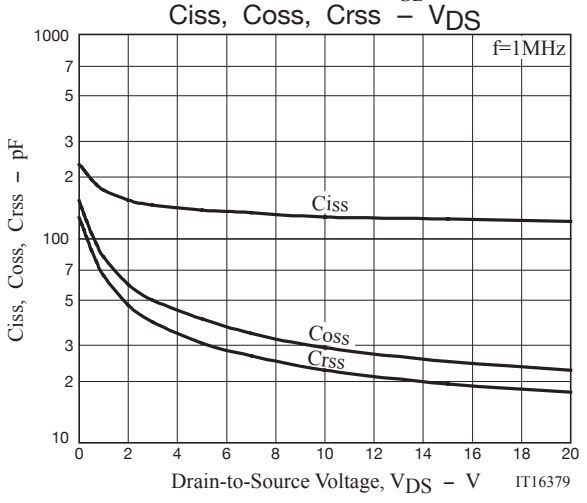

RDS(on) – VGS
Ta=25°C
ID=0.1A
0.5A
1A
Static Drain-to-Source On-State Resistance, RDS(on) – mΩ
Gate-to-Source Voltage, VGS – V
IT16712

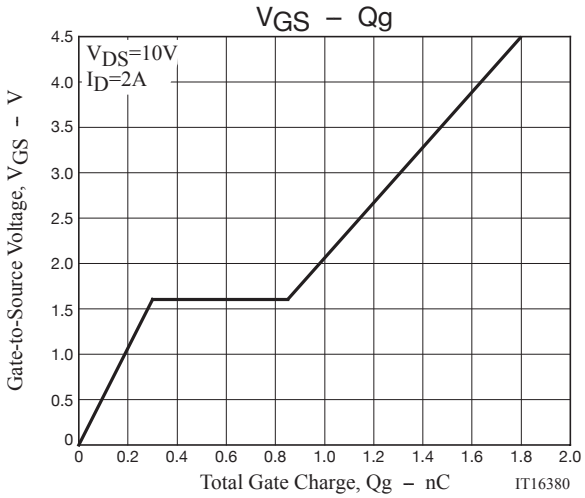

RDS(on) – Ta
VGS=1.8V, ID=0.1A
VGS=2.5V, ID=0.5A
VGS=4.5V, ID=1.0A
Static Drain-to-Source On-State Resistance, RDS(on) – mΩ
Ambient Temperature, Ta – °C
IT16713

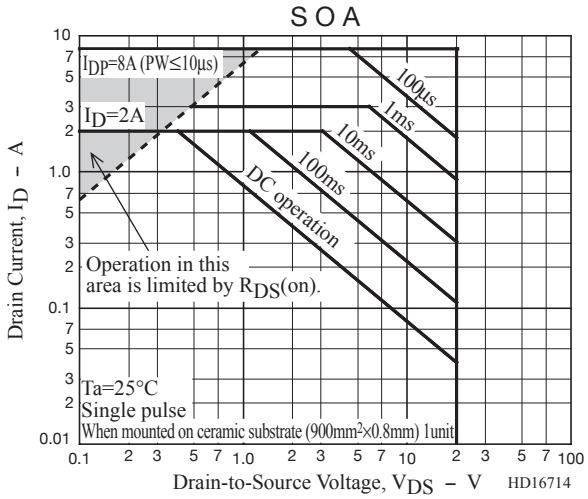

gFS – ID
VDS=10V
Ta= –25°C
75°C
25°C
Forward Transconductance, gFS – S
Drain Current, ID – A
HD16643

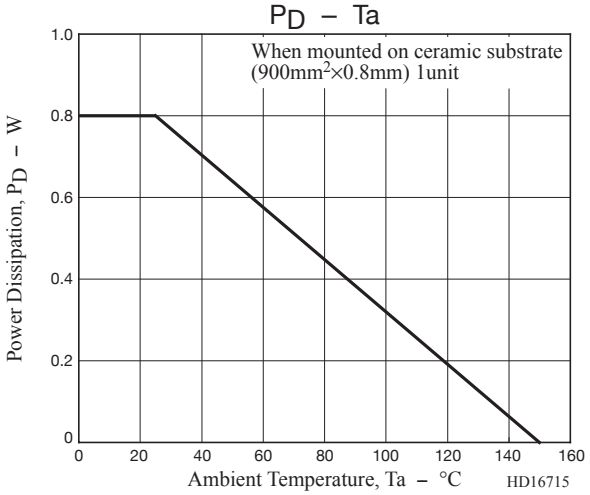

IS – VSD
VGS=0V
Ta=75°C
25°C
–25°C
Source Current, IS – A
Forward Diode Voltage, VSD – V
HD16377

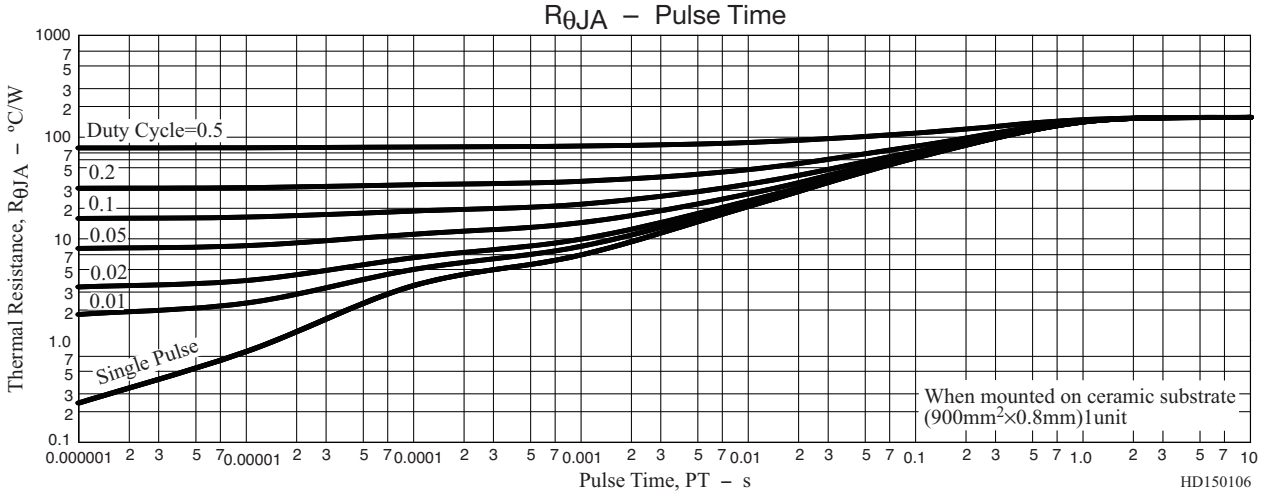

SW Time – ID
VDD=10V
VGS=4.5V
tf
td(off)
td(on)
tr
Switching Time, SW Time – ns
Drain Current, ID – A
IT16644


Ciss, Coss, Crss – VDS
f=1MHz
Ciss
Coss
Crss
Ciss, Coss, Crss – pF
Drain-to-Source Voltage, VDS – V
IT16379


VGS – Qg
VDS=10V
ID=2A
Gate-to-Source Voltage, VGS – V
Total Gate Charge, Qg – nC
IT16380


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) 1unit
Drain Current, ID – A
Drain-to-Source Voltage, VDS – V
HD16714


PD – Ta
When mounted on ceramic substrate (900mm2×0.8mm) 1unit
Power Dissipation, PD – W
Ambient Temperature, Ta – °C
HD16715

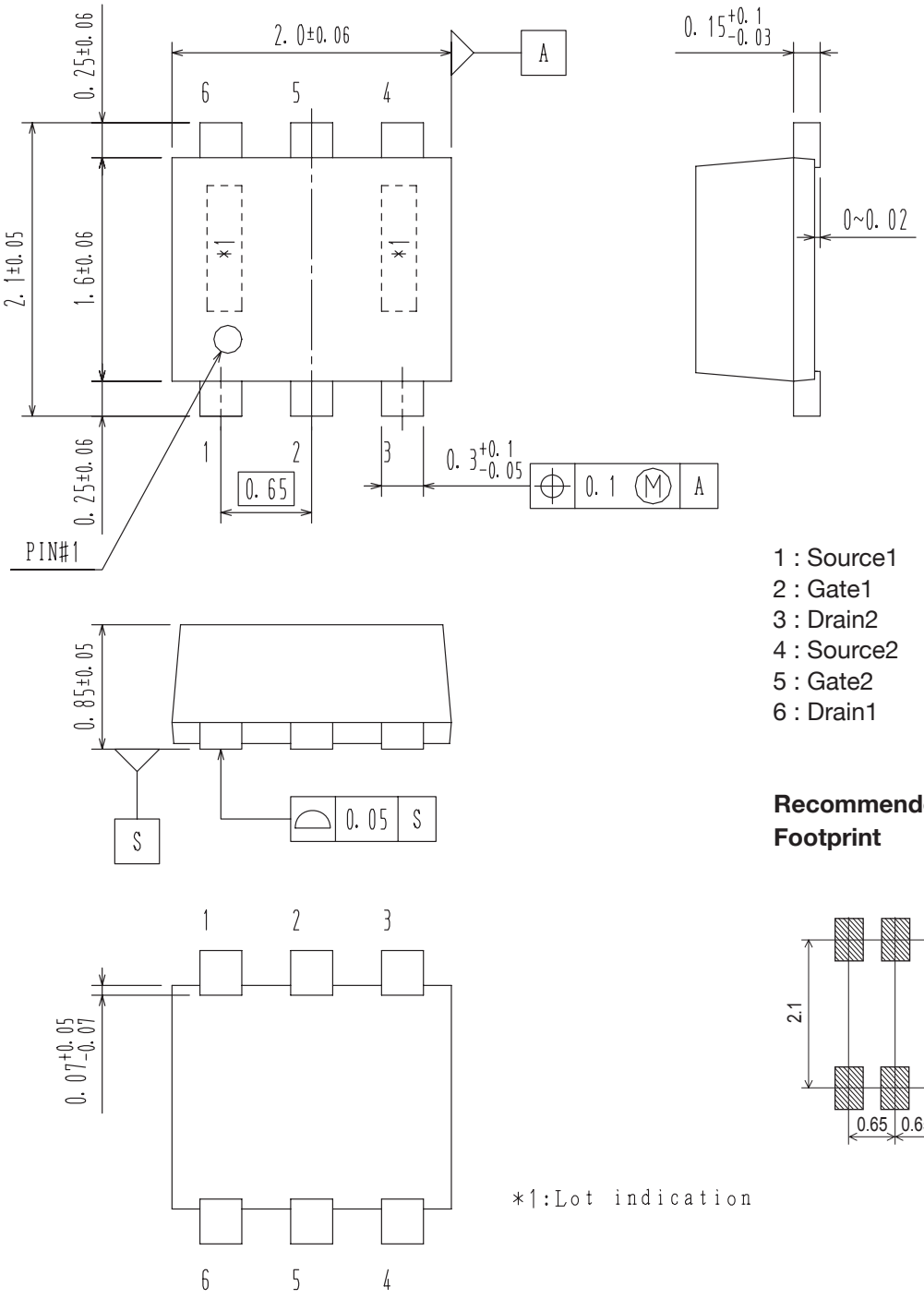

RθJA – Pulse Time
Duty Cycle=0.5
0.2
0.1
0.05
0.02
0.01
Single Pulse
When mounted on ceramic substrate (900mm2×0.8mm)1unit
Thermal Resistance, RθJA – °C/W
Pulse Time, PT – s
HD150106

## Package Dimensions

unit : mm

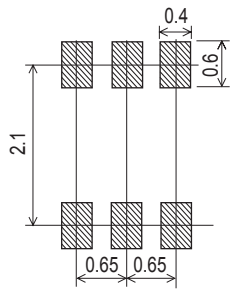
MCH6662-TL-H, MCH6662-TL-W

**SC-88FL / MCPH6**
CASE 419AS
ISSUE O




1 : Source1
2 : Gate1
3 : Drain2
4 : Source2
5 : Gate2
6 : Drain1

**Recommended Soldering Footprint**




*1:Lot indication

## ORDERING INFORMATION

| Device | Package | Shipping | memo |
|---|---|---|---|
| MCH6662-TL-H | MCPH6 | 3,000pcs./reel | Pb-Free and Halogen Free |
| MCH6662-TL-W | | | |

Note on usage : Since the MCH6662 is a MOSFET product, please avoid using this device in the vicinity of highly charged objects.