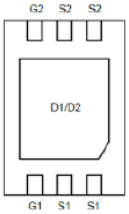
# GPCD2007

## 20V Dual N-Channel MOSFET

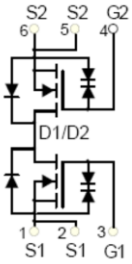
### Product Summary

| $V_{(BR)DSS}$ | $R_{DS(on)TYP}$ | $I_D$ |
|---|---|---|
| 20V | 12.5mΩ@4.5V | 8A |
| | 13mΩ@4.0V | |
| | 13.5mΩ@3.8V | |
| | 14.5mΩ@3.1V | |
| | 17mΩ@2.5V | |

**DFN2X3-6L**



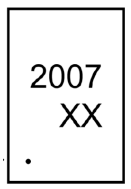

**Schematic diagram**



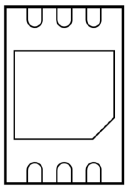

### Description

The GPCD2007 uses advanced trench technology to provide excellent $R_{DS(ON)}$ and low gate charge. It is ESD protected. This device is suitable for use as a uni-directional or bi-directional load switch,facilitated by its common-drain configuration.

### Marking:




Top



back

2007 = Device Code

XX = Date Code

### ABSOLUTE MAXIMUM RATINGS ($T_A$=25°C unless otherwise noted)

| Parameter | Symbol | Value | Unit |
|---|---|---|---|
| Drain-Source Voltage | $V_{DS}$ | 20 | V |
| Gate-Source Voltage | $V_{GS}$ | ±12 | V |
| Continuous Drain Current | $I_D$ | 8 | A |
| Pulsed Drain Current | $I_{DM}^*$ | 45 | A |
| Power Dissipation | $P_D$ | 1.5 | W |
| Thermal Resistance from Junction to Ambient | $R_{\theta JA}$ | 83.3 | °C/W |
| Junction Temperature | $T_J$ | 150 | °C |
| Storage Temperature | $T_{STG}$ | -55~ +150 | °C |
| Lead Temperature for Soldering Purposes(1/8'' from case for 10 s) | $T_L$ | 260 | °C |

## MOSFET ELECTRICAL CHARACTERISTICS ($T_A$ = 25°C unless otherwise noted)

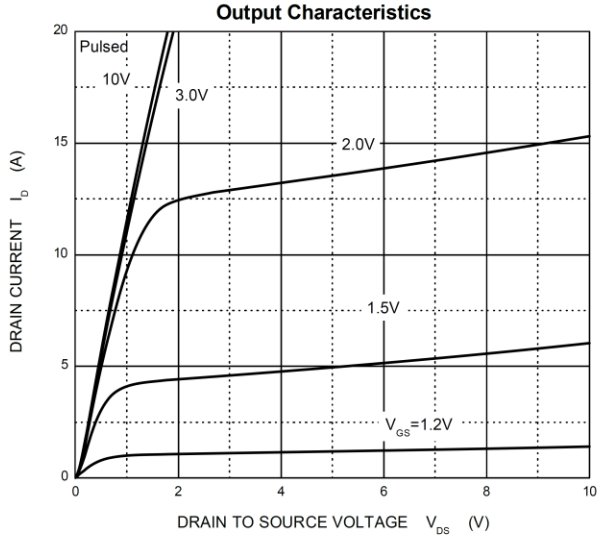
| Parameter | Symbol | Test Condition | Min | Type | Max | Unit |
|---|---|---|---|---|---|---|
| **Off Characteristics** | | | | | | |
| Drain-Source Breakdown Voltage | $V_{(BR)DSS}$ | $V_{GS}$ = 0V, $I_D$ = 250μA | 20 | | | V |
| Zero Gate Voltage Drain Current | $I_{DSS}$ | $V_{DS}$ = 16V, $V_{GS}$ = 0V | | | 1 | μA |
| Gate-Body Leakage Current | $I_{GSS}$ | $V_{GS}$ = ±4.5V, $V_{DS}$ = 0V | | | ±1 | μA |
| | | $V_{GS}$ = ±8.0V, $V_{DS}$ = 0V | | | ±10 | μA |
| **On Characteristics**[1] | | | | | | |
| Gate Threshold Voltage | $V_{GS(th)}$ | $V_{DS}$ = $V_{GS}$, $I_D$ = 250μA | 0.4 | 0.7 | 1.0 | V |
| Drain-Source On-Resistance | $R_{DS(on)}$ | $V_{GS}$ = 4.5V, $I_D$ = 3.0A | 10 | 12.5 | 15 | mΩ |
| | | $V_{GS}$ = 4.0V, $I_D$ = 3.0A | 10.5 | 13 | 16 | |
| | | $V_{GS}$ = 3.8V, $I_D$ = 3.0A | 10.8 | 13.5 | 16.5 | |
| | | $V_{GS}$ = 3.1V, $I_D$ = 3.0A | 12 | 14.5 | 18 | |
| | | $V_{GS}$ = 2.5V, $I_D$ = 3.0A | 13 | 17 | 23 | |
| Forward Transconductance | $g_{FS}$ | $V_{DS}$ = 5V, $I_D$ = 7A | 9 | | | S |
| **Dynamic Characteristics**[2] | | | | | | |
| Input Capacitance | $C_{iss}$ | $V_{DS}$ = 10V, $V_{GS}$ = 0V, f = 1MHz | | 1150 | | pF |
| Output Capacitance | $C_{oss}$ | | | 185 | | |
| Reverse Transfer Capacitance | $C_{rss}$ | | | 145 | | |
| **Switching Characteristics**[2] | | | | | | |
| Total Gate Charge | $Q_g$ | $V_{DS}$ = 10V, $V_{GS}$ = 4.5V, $I_D$ = 7A | | 15 | | nC |
| Gate-Source Charge | $Q_{gs}$ | | | 0.8 | | |
| Gate-Drain Charge | $Q_{gd}$ | | | 3.2 | | |
| Turn-On Delay Time | $t_{d(on)}$ | $V_{DD}$ = 10V, $V_{GS}$ = 5V, $R_G$ = 3Ω, $R_L$ = 1.35Ω | | 6 | | ns |
| Turn-On Rise Time | $t_r$ | | | 13 | | |
| Turn-Off Delay Time | $t_{d(off)}$ | | | 52 | | |
| Turn-Off Fall Time | $t_f$ | | | 16 | | |
| **Source-Drain Diode Characteristics** | | | | | | |
| Diode Forward Voltage[1] | $V_{SD}$ | $V_{GS}$ = 0V, $I_S$ = 1.0A | | | 1.0 | V |
| Diode Forward Current | $I_S$ | | | | 6.0 | A |

Notes :

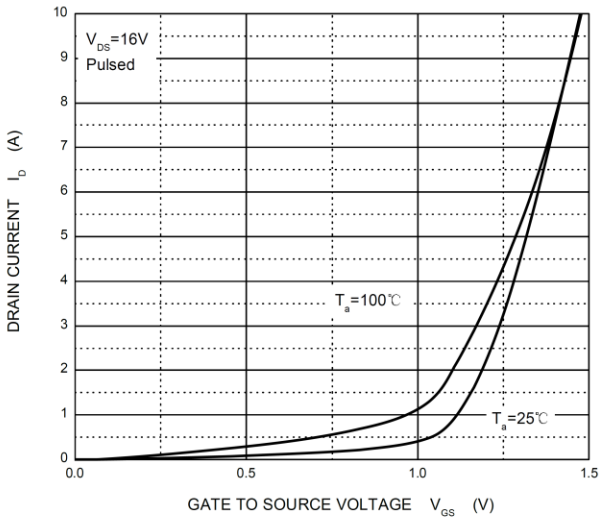
1. Pulse Test: Pulse width≤300μs, duty cycle≤0.5%.
2. Guaranteed by design, not subject to production testing.

## Typical Electrical and Thermal Characteristics

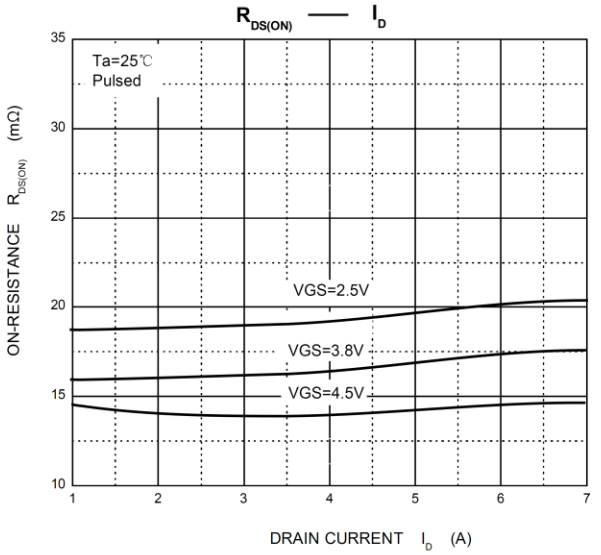
**Output Characteristics**



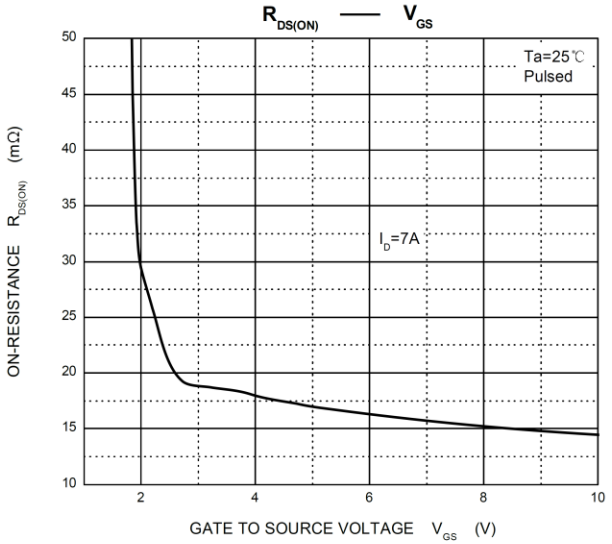

**Transfer Characteristics**



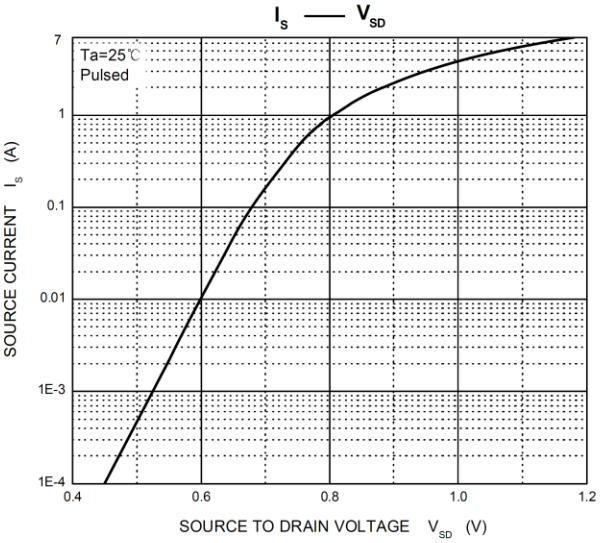

**$R_{DS(ON)}$ — $I_D$**



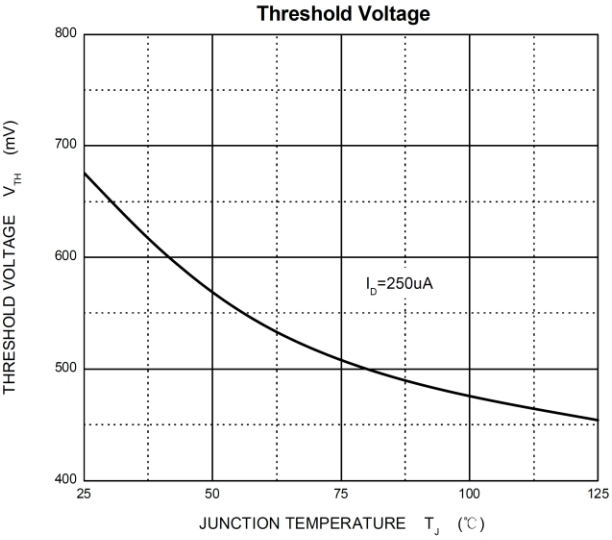

**$R_{DS(ON)}$ — $V_{GS}$**

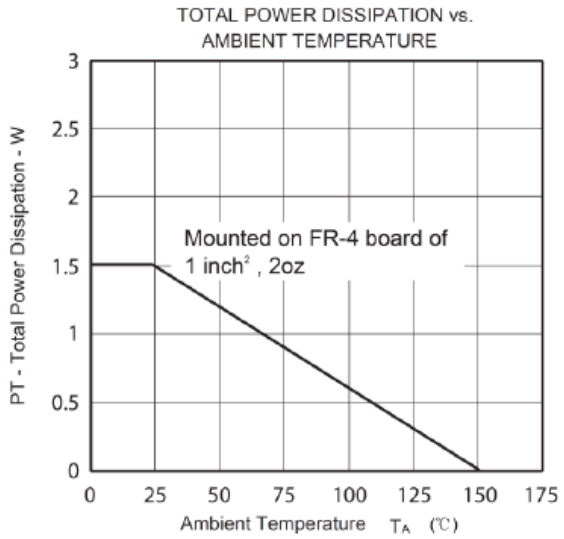


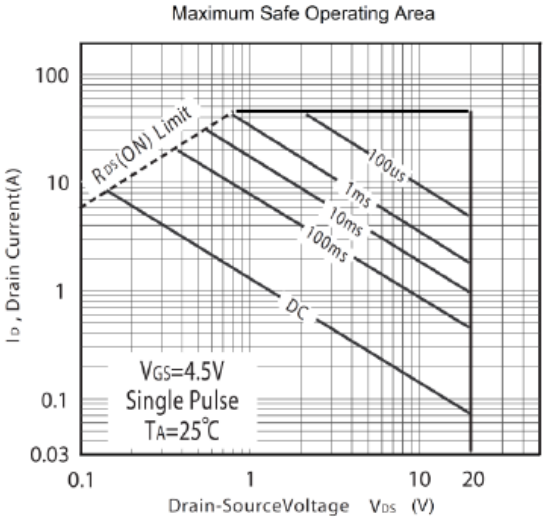

**$I_S$ — $V_{SD}$**

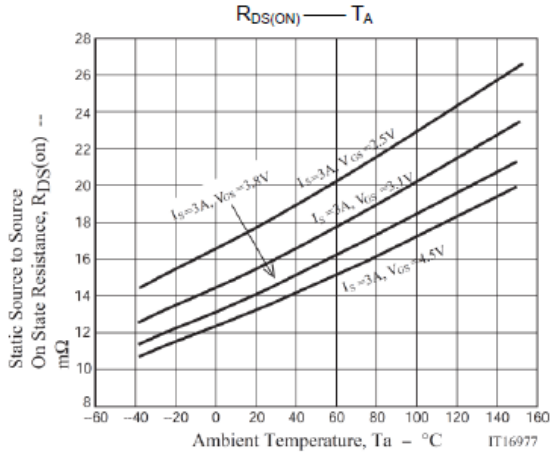



**Threshold Voltage**

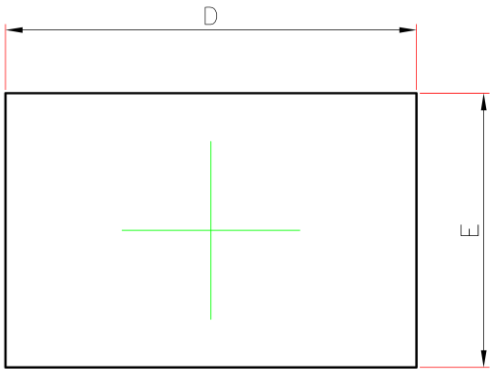



TOTAL POWER DISSIPATION vs.
AMBIENT TEMPERATURE
PT - Total Power Dissipation - W
Mounted on FR-4 board of
1 inch², 2oz
Ambient Temperature TA (℃)

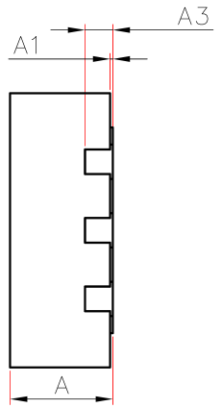

Maximum Safe Operating Area
ID, Drain Current(A)
RDS(ON) Limit
100us
1ms
10ms
100ms
DC
VGS=4.5V
Single Pulse
TA=25℃
Drain-SourceVoltage VDS (V)


RDS(ON) —— TA
Static Source to Source
On State Resistance, RDS(on) --
mΩ
Ambient Temperature, Ta – °C
IT16977

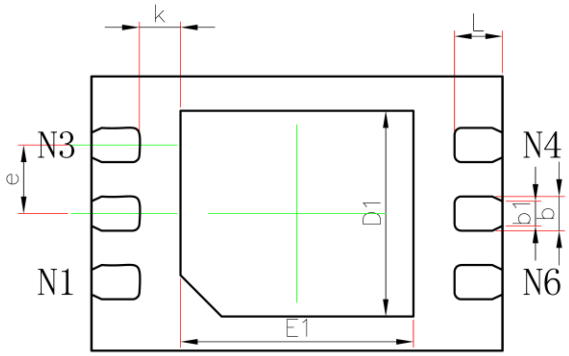
## DFN2X3-6L Package Information




TOP VIEW




SIDE VIEW




BOTTOM VIEW

| Symbol | Dimensions In Millimeters | | Dimensions In Inches | |
|---|---|---|---|---|
| | Min. | Max. | Min. | Max. |
| A | 0.700 | 0.800 | 0.028 | 0.031 |
| A1 | 0.000 | 0.050 | 0.000 | 0.002 |
| A3 | 0.203REF | | 0.008REF | |
| D | 2.900 | 3.100 | 0.114 | 0.122 |
| E | 1.900 | 2.100 | 0.075 | 0.083 |
| D1 | 1.400 | 1.600 | 0.055 | 0.063 |
| E1 | 1.600 | 1.800 | 0.063 | 0.071 |
| b | 0.200 | 0.300 | 0.008 | 0.012 |
| k | 0.150 | 0.350 | 0.006 | 0.014 |
| b1 | 0.180REF | | 0.007REF | |
| e | 0.500BSC | | 0.020BSC | |
| L | 0.300 | 0.450 | 0.012 | 0.018 |

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