# µPA572CT

## N-CHANNEL MOSFET FOR SWITCHING

R07DS1281EJ0300
Rev.3.00
Dec 22, 2015

### Description

The UPA572CT, N-channel vertical type MOSFET designed for general-purpose switch, is a device which can be driven directly by a 4.5 V power source.

### Features

- Two MOSFET circuits (Two source common)
- Directly driven by a 4.5 V power source.
- Low on-state resistance
  $R_{DS(on)1}$ = 2.7 Ω MAX. ($V_{GS}$ = 10 V, $I_D$ = 100 mA)
  $R_{DS(on)2}$ = 3.2 Ω MAX. ($V_{GS}$ = 4.5 V, $I_D$ = 50 mA)

### Ordering Information

| Part Number | Lead Plating | Packing | Package |
|---|---|---|---|
| UPA572CT-T1-A/AT | -A : Sn-Bi , -AT : Pure Sn | 3000p/Reel | SC-88A (5pSSP) |

**Remark** "-A/AT" indicates Pb-free. This product does not contain Pb in external electrode and other parts.

### Marking UG

### Absolute Maximum Ratings ($T_A$ = 25°C)

| | | | |
|---|---|---|---|
| Drain to Source Voltage ($V_{GS}$ = 0 V) | $V_{DSS}$ | 60 | V |
| Gate to Source Voltage ($V_{DS}$ = 0 V) | $V_{GSS}$ | ±20 | V |
| Drain Current (DC) | $I_{D(DC)}$ | ±100 | mA |
| Drain Current (pulse) **Note** | $I_{D(pulse)}$ | ±200 | mA |
| Total Power Dissipation | $P_T$ | 200 (Total) | mW |
| Channel Temperature | $T_{ch}$ | 150 | °C |
| Storage Temperature | $T_{stg}$ | −55 to +150 | °C |

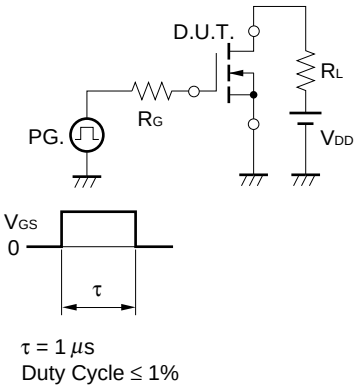
**Note** PW ≤ 10 µs, Duty Cycle ≤ 1%

## Electrical Characteristics ($T_A$ = 25°C)

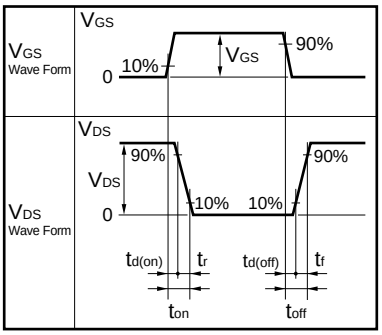
| Characteristics | Symbol | Test Conditions | MIN. | TYP. | MAX. | UNIT |
|---|---|---|---|---|---|---|
| Zero Gate Voltage Drain Current | $I_{DSS}$ | $V_{DS}$ = 60 V, $V_{GS}$ = 0 V | | | 1 | µA |
| Gate Leakage Current | $I_{GSS}$ | $V_{GS}$ = ±20 V, $V_{DS}$ = 0 V | | | ±10 | µA |
| Gate to Source Cut-off Voltage | $V_{GS(off)}$ | $V_{DS}$ = $V_{GS}$, $I_D$ = 250 µA | 1.0 | | 2.5 | V |
| Forward Transfer Admittance **Note** | $\|y_{fs}\|$ | $V_{DS}$ = 10 V, $I_D$ = 100 mA | 150 | | | mS |
| Drain to Source On-state Resistance **Note** | $R_{DS(on)1}$ | $V_{GS}$ = 10 V, $I_D$ = 100 mA | | 2.1 | 2.7 | Ω |
| | $R_{DS(on)2}$ | $V_{GS}$ = 4.5 V, $I_D$ = 50 mA | | 2.4 | 3.2 | Ω |
| Input Capacitance | $C_{iss}$ | $V_{DS}$ = 10 V, | | 20 | | pF |
| Output Capacitance | $C_{oss}$ | $V_{GS}$ = 0 V, | | 9 | | pF |
| Reverse Transfer Capacitance | $C_{rss}$ | f = 1.0 MHz | | 2 | | pF |
| Turn-on Delay Time | $t_{d(on)}$ | $V_{DD}$ = 10 V, | | 16 | | ns |
| Rise Time | $t_r$ | $I_D$ = 200 mA, | | 6.5 | | ns |
| Turn-off Delay Time | $t_{d(off)}$ | $V_{GS}$ = 10 V, | | 82 | | ns |
| Fall Time | $t_f$ | $R_G$ = 10 Ω | | 32 | | ns |
| Total Gate Charge | $Q_G$ | $I_D$ = 200 mA, $V_{DD}$ = 25 V, $V_{GS}$ = 10 V | | 2 | | nC |
| Body Diode Forward Voltage **Note** | $V_{F(S-D)}$ | $I_F$ = 200 mA, $V_{GS}$ = 0 V | | 0.86 | | V |

**Note** Pulsed

## Test Circuit Switching Time

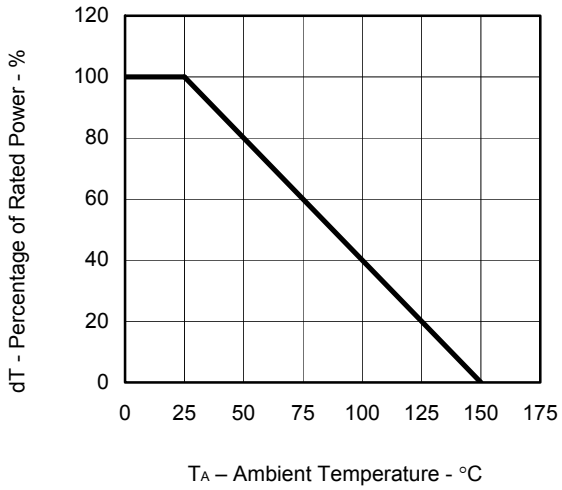



τ = 1 µs
Duty Cycle ≤ 1%

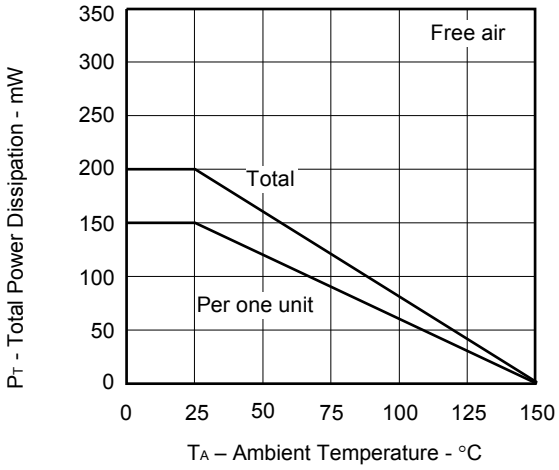


## Typical Characteristics ($T_A$ = 25°C)

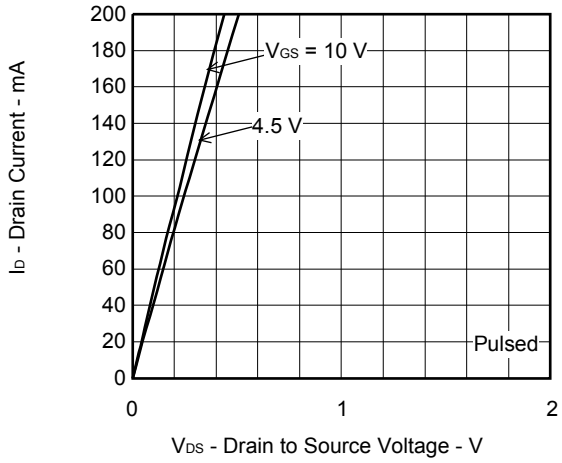
DERATING FACTOR OF FORWARD BIAS SAFE OPERATING AREA



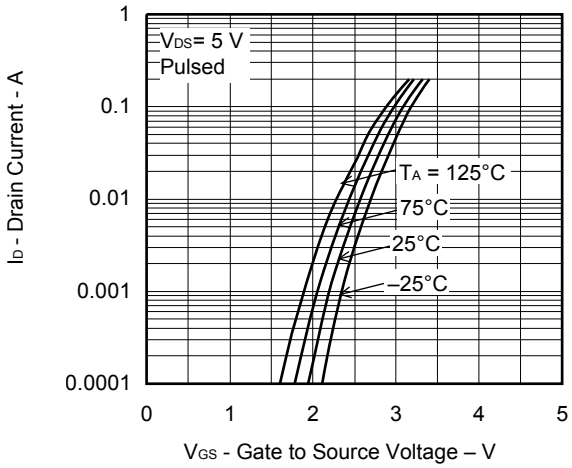

TOTAL POWER DISSIPATION vs. AMBIENT TEMPERATURE



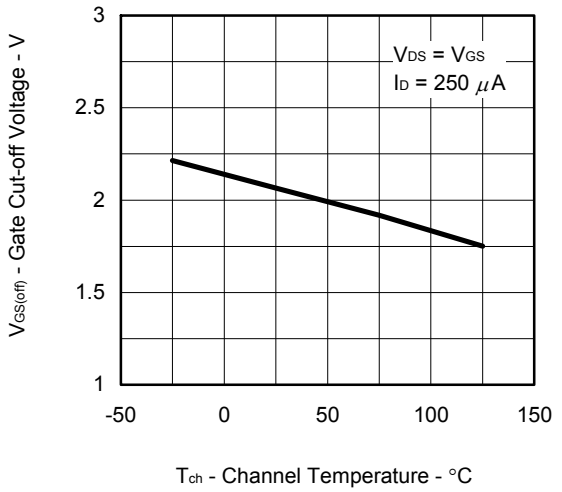

DRAIN CURRENT vs. DRAIN TO SOURCE VOLTAGE



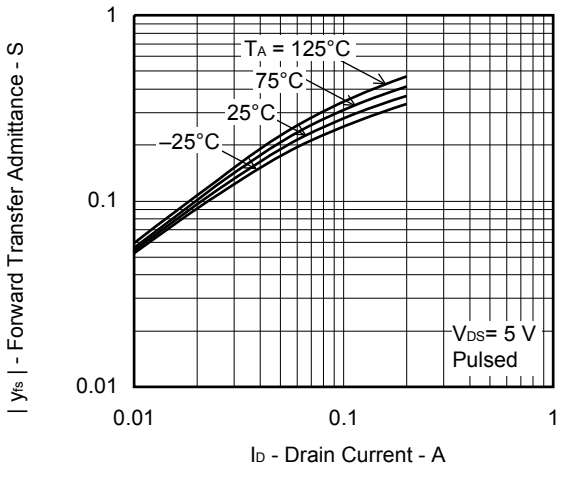

FORWARD TRANSFER CHARACTERISTICS



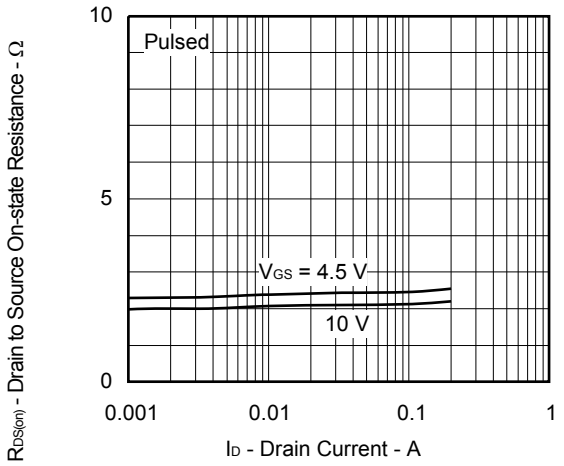

GATE CUT-OFF VOLTAGE vs. CHANNEL TEMPERATURE



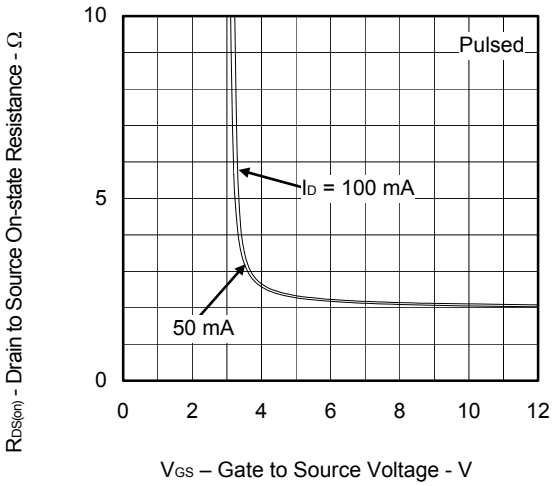

FORWARD TRANSFER ADMITTANCE vs. DRAIN CURRENT



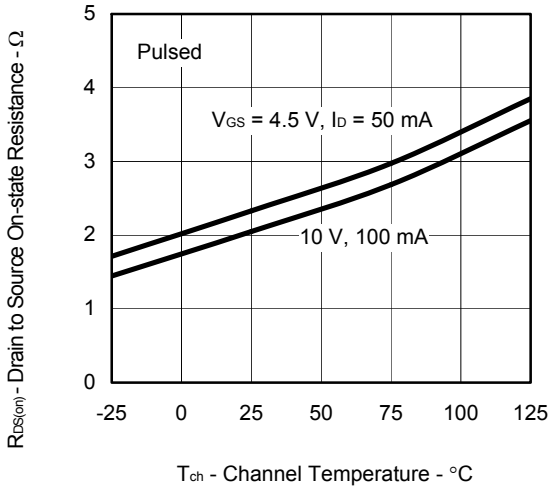
DRAIN TO SOURCE ON-STATE RESISTANCE vs.
DRAIN CURRENT



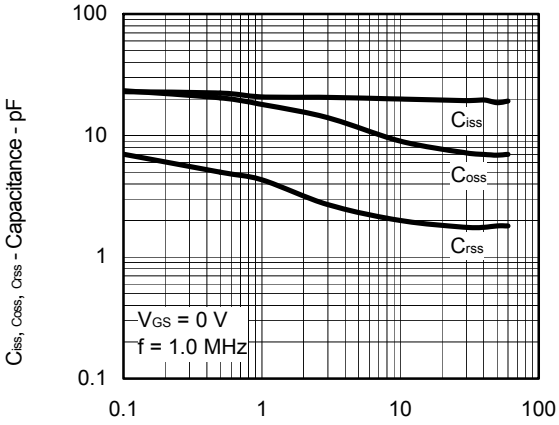

DRAIN TO SOURCE ON-STATE RESISTANCE vs.
GATE TO SOURCE VOLTAGE



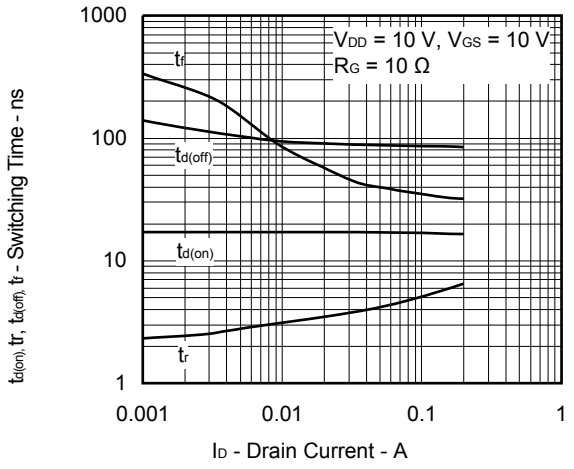

DRAIN TO SOURCE ON-STATE RESISTANCE vs.
CHANNEL TEMPERATURE



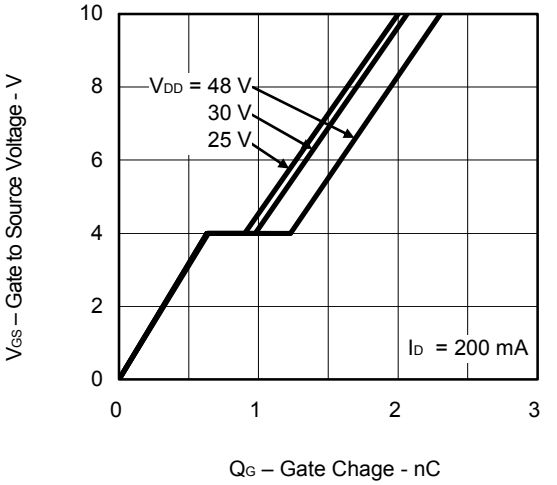

CAPACITANCE vs.
DRAIN TO SOURCE VOLTAGE



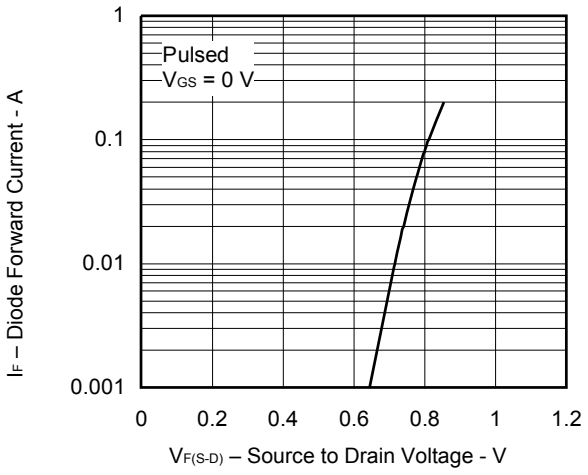

SWITCHING CHARACTERISTICS



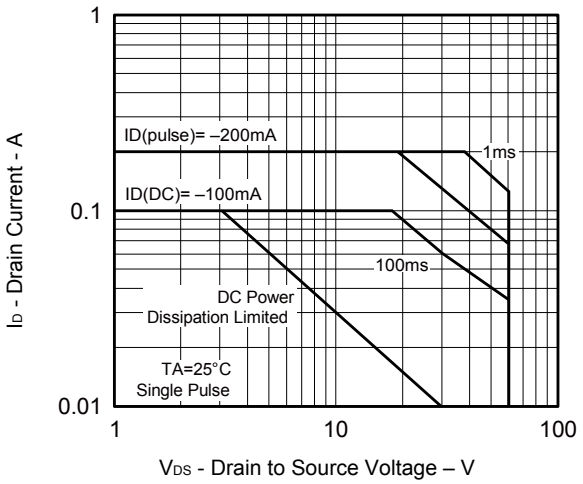

DYNAMIC INPUT CHARACTERISTICS



SOURCE TO DRAIN DIODE FORWARD VOLTAGE

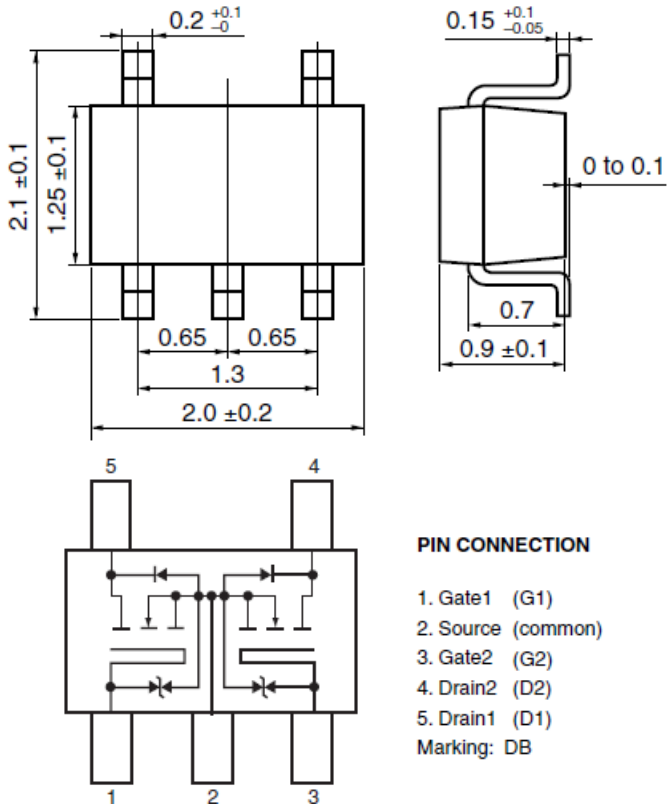



FORWARD BIAS SAFE OPERATING AREA

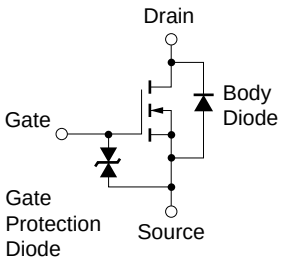


**Package Drawings (Unit: mm)**

**SC-88A (5pSSP)**




**Equivalent Circuit**




Remark **The diode connected between the gate and source of the transistor serves as a protector against ESD. When this device actually used, an additional protection circuit is externally required if a voltage exceeding the rated voltage may be applied to this device.**

| Rev. | Date | Description | |
|---|---|---|---|
| | | Page | Summary |
| 1.00 | Sep , 2013 | – | First Edition Issued |
| 2.00 | Jun, 2015 | 2 | - Changed Electrical Characteristics<br>- Changed Test Circuit Switching Time |
| | | 3, 4, 5 | Changed all graphs |
| | | 5 | Added FORWARD BIAS SAFE OPERATING AREA |

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