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PCP1302

P-Channel Power MOSFET –60V, –3A, 266mΩ, Single PCP

Features

- On-resistance $R_{DS(on)1}=200\text{m}\Omega(\text{typ.})$
- 4V drive
- Halogen free compliance
- Protection Diode in

Specifications

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

| Parameter | Symbol | Conditions | Value | Unit |
|-------------------------|-----------|--|-------------|------------------|
| Drain to Source Voltage | V_{DSS} | | –60 | V |
| Gate to Source Voltage | V_{GSS} | | ± 20 | V |
| Drain Current (DC) | I_D | | –3 | A |
| Drain Current (Pulse) | I_{DP} | $PW \leq 10\mu\text{s}$, duty cycles $\leq 1\%$ | –12 | A |
| Power Dissipation | P_D | $T_c = 25^\circ\text{C}$ | 3.5 | W |
| | | When mounted on ceramic substrate ($600\text{mm}^2 \times 0.8\text{mm}$) | 1.3 | W |
| Junction Temperature | T_j | | 150 | $^\circ\text{C}$ |
| Storage Temperature | T_{stg} | | –55 to +150 | $^\circ\text{C}$ |

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 Case Steady State | $R_{\theta JC}$ | 35.7 | $^\circ\text{C}/\text{W}$ |
| Junction to Ambient When mounted on ceramic substrate ($600\text{mm}^2 \times 0.8\text{mm}$) | $R_{\theta JA}$ | 96.1 | $^\circ\text{C}/\text{W}$ |

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

| Parameter | Symbol | Conditions | Value | | | Unit |
|--|---------------|--|-------|-----|----------|------------------|
| | | | min | typ | max | |
| Drain to Source Breakdown Voltage | $V_{(BR)DSS}$ | $I_D = -1\text{mA}$, $V_{GS} = 0\text{V}$ | –60 | | | V |
| Zero-Gate Voltage Drain Current | I_{DSS} | $V_{DS} = -60\text{V}$, $V_{GS} = 0\text{V}$ | | | –1 | μA |
| Gate to Source Leakage Current | I_{GSS} | $V_{GS} = \pm 20\text{V}$, $V_{DS} = 0\text{V}$ | | | ± 10 | μA |
| Gate Threshold Voltage | $V_{GS(th)}$ | $V_{DS} = -10\text{V}$, $I_D = -1\text{mA}$ | –1.2 | | –2.6 | V |
| Forward Transconductance | g_{FS} | $V_{DS} = -10\text{V}$, $I_D = -1.5\text{A}$ | | 3.2 | | S |
| Static Drain to Source On-State Resistance | $R_{DS(on)1}$ | $I_D = -1.5\text{A}$, $V_{GS} = -10\text{V}$ | | 200 | 266 | $\text{m}\Omega$ |
| | $R_{DS(on)2}$ | $I_D = -1\text{A}$, $V_{GS} = -4.5\text{V}$ | | 245 | 334 | $\text{m}\Omega$ |
| | $R_{DS(on)3}$ | $I_D = -1\text{A}$, $V_{GS} = -4\text{V}$ | | 260 | 374 | $\text{m}\Omega$ |
| Input Capacitance | C_{iss} | $V_{DS} = -20\text{V}$, $f = 1\text{MHz}$ | | 262 | | pF |
| Output Capacitance | C_{oss} | | | 29 | | pF |
| Reverse Transfer Capacitance | C_{rss} | | | 19 | | pF |

Continued on next page.

ORDERING INFORMATION

See detailed ordering and shipping information on page 2 of this data sheet.

PCP1302

Continued from preceding page.

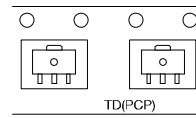
| Parameter | Symbol | Conditions | Value | | | Unit |
|-------------------------------|--------------|-------------------------------------|-------|------|------|------|
| | | | min | typ | max | |
| Turn-ON Delay Time | $t_{d(on)}$ | See specified Test Circuit. | | 5.1 | | ns |
| Rise Time | t_r | | | 6.0 | | ns |
| Turn-OFF Delay Time | $t_{d(off)}$ | | | 34 | | ns |
| Fall Time | t_f | | | 21 | | ns |
| Total Gate Charge | Q_g | $V_{DS}=-30V, V_{GS}=-10V, I_D=-3A$ | | 6.4 | | nC |
| Gate to Source Charge | Q_{gs} | | | 0.8 | | nC |
| Gate to Drain "Miller" Charge | Q_{gd} | | | 1.4 | | nC |
| Forward Diode Voltage | V_{SD} | $I_S=-3A, V_{GS}=0V$ | | -0.9 | -1.5 | 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.

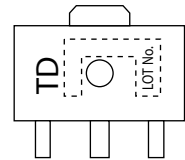
Ordering & Package Information

| Device | Package | Shipping | note |
|--------------|------------------------------|----------------------|--------------------------------|
| PCP1302-TD-H | PCP, SC-62 SOT-89, TO-243 | 1,000 pcs. / reel | Pb-Free And Halogen Free |

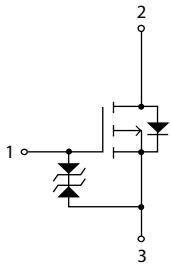
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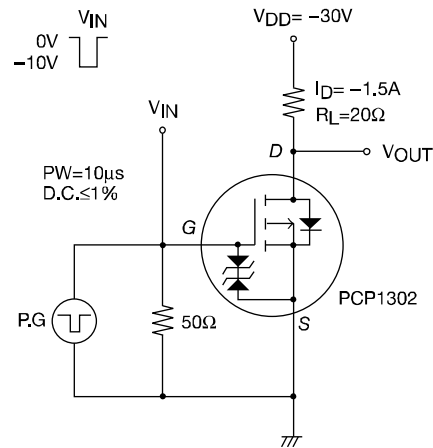
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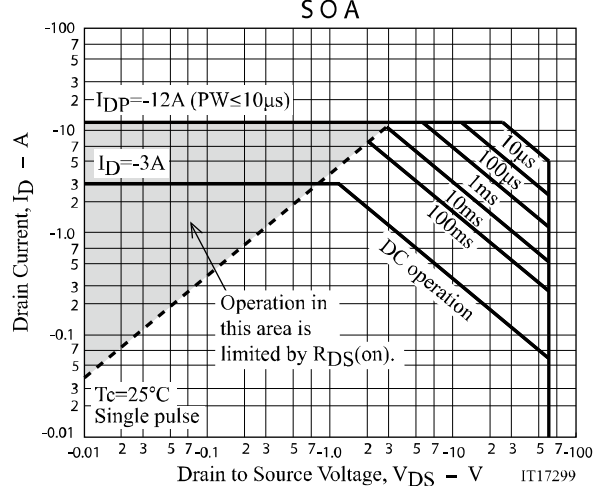
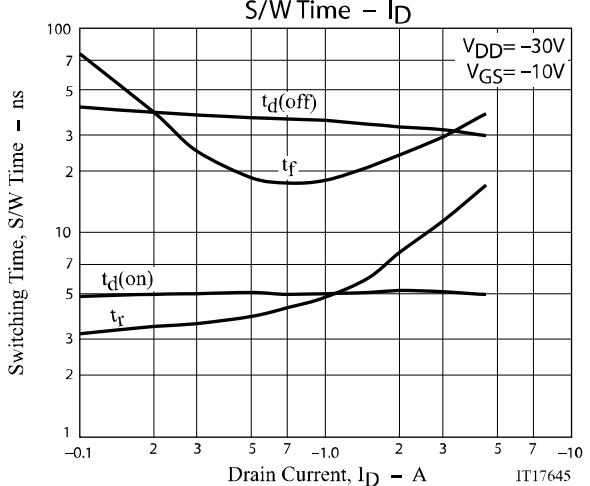
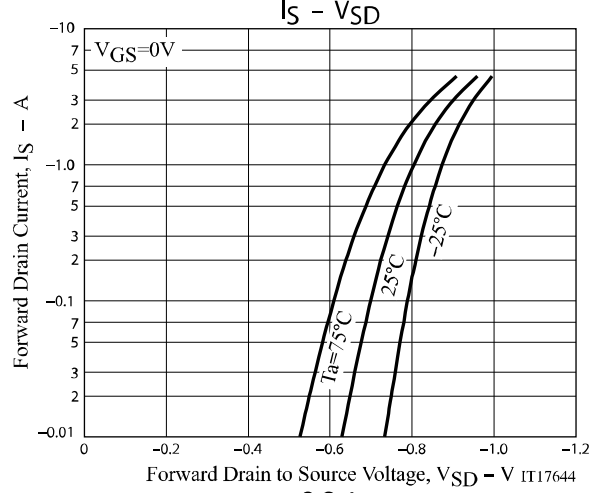
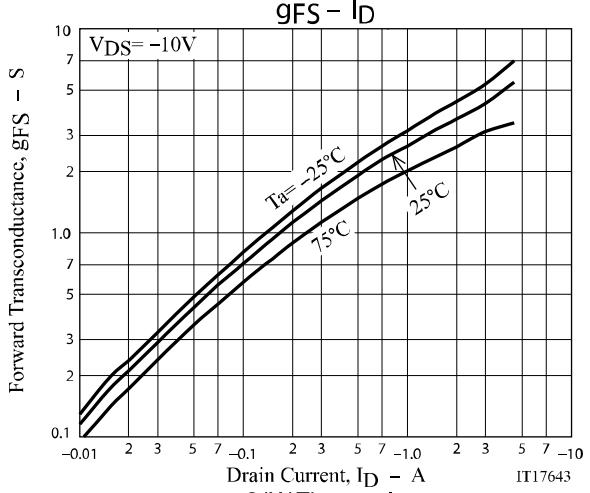
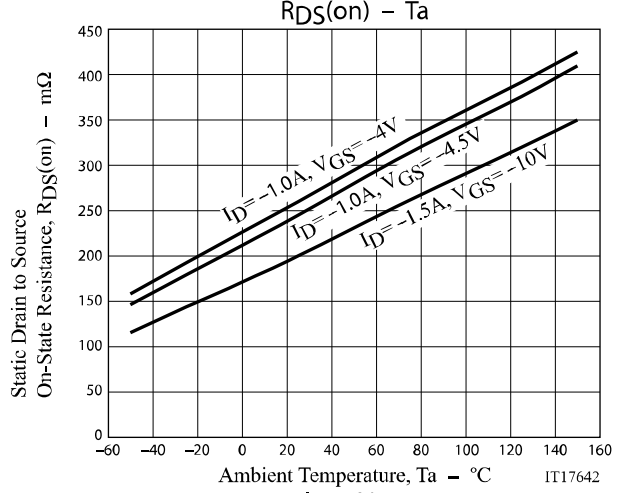
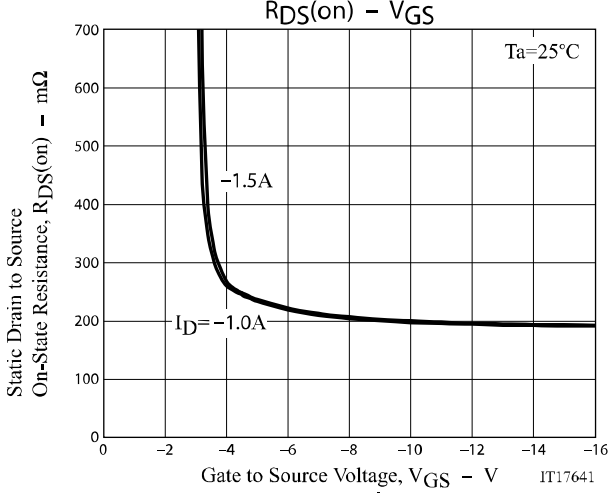
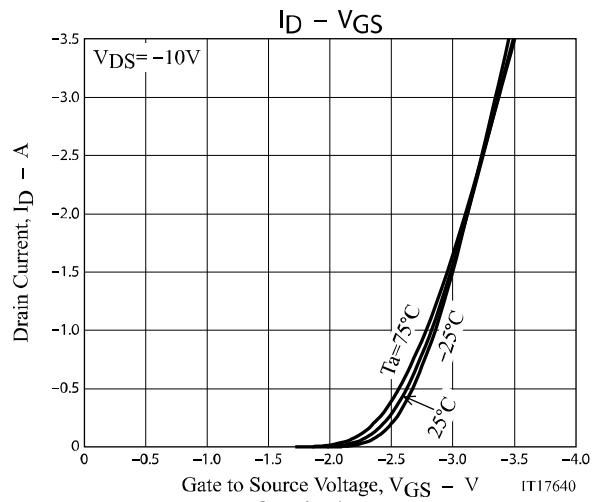
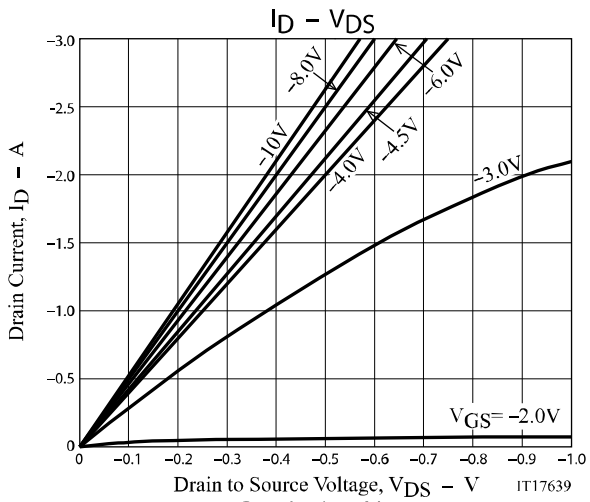


Electrical Connection

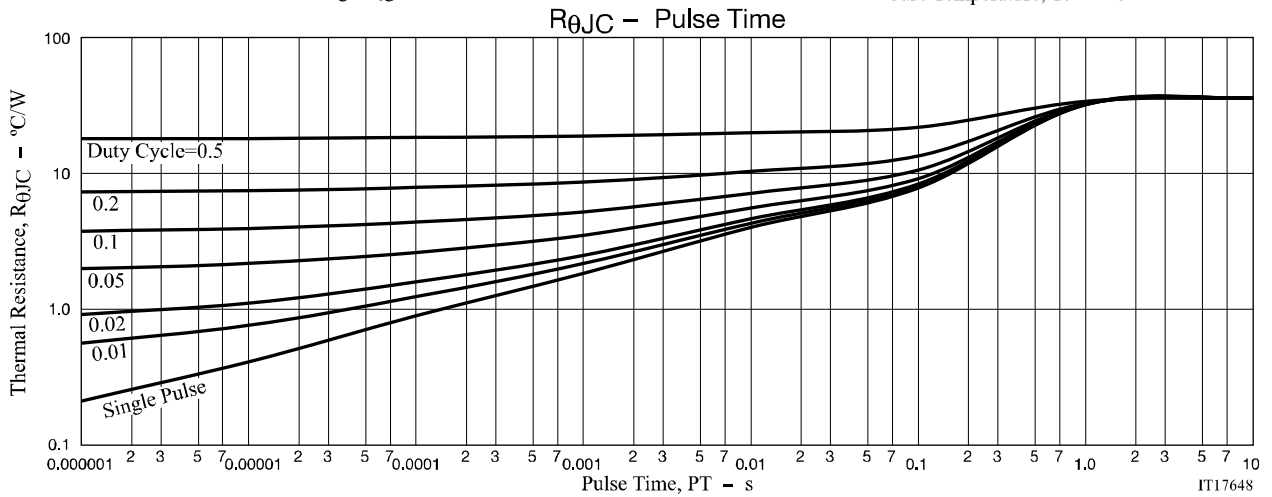
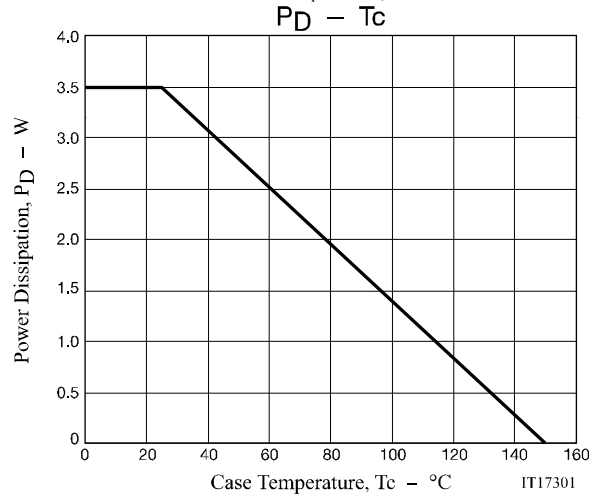
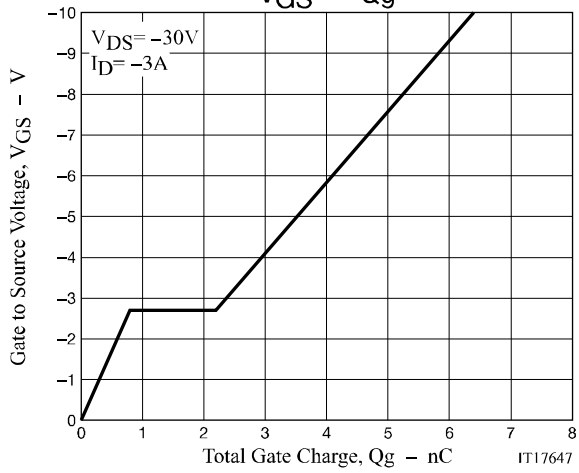
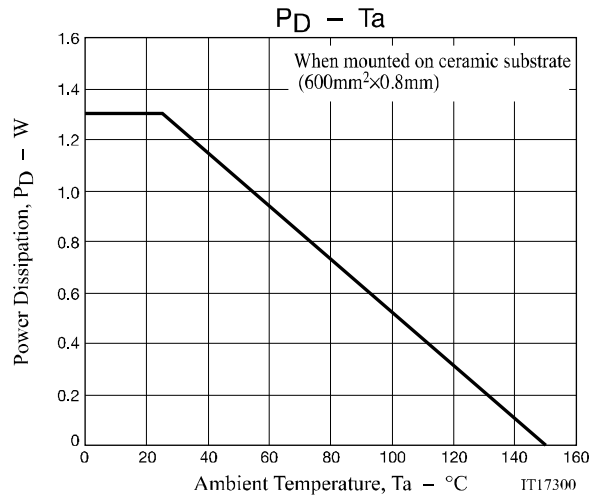
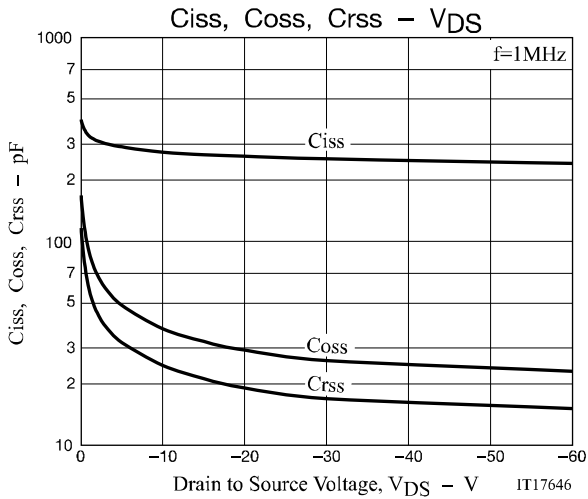


Switching Time Test Circuit





PCP1302



PCP1302

Package Dimensions

PCP1302-TD-H

SOT-89/PCP-1

CASE 419AU

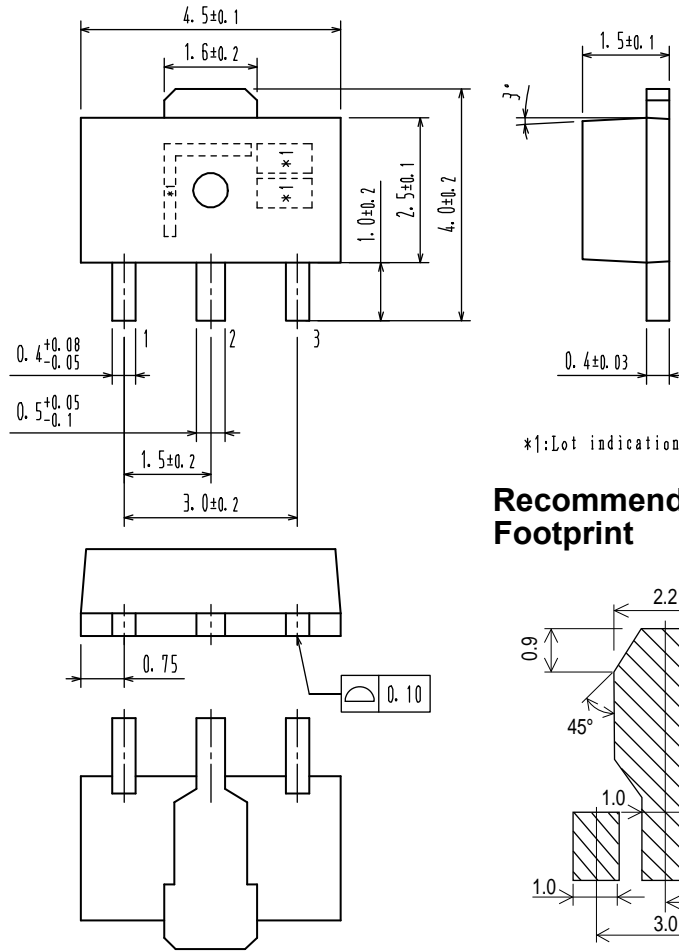
ISSUE O

Unit : mm

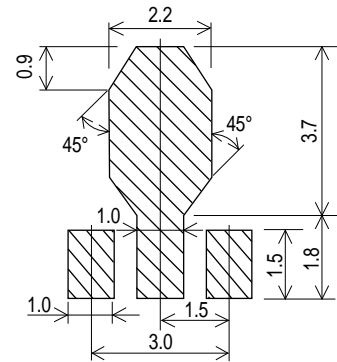
1: Gate

2: Drain

3: Source



Recommended Soldering Footprint



Note on usage : Since the PCP1302 is a MOSFET product, please avoid using this device in the vicinity of highly charged objects.

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