Ordering number : ENA2227

PCP1302

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

ON Semiconductor®

http://onsemi.com

Features

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

Specifications

Absolute Maximum Ratings at Ta = 25°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≤10μs, duty cycle≤1%	–12	A
Power Dissipation	P_D	Tc=25°C	3.5	W
		When mounted on ceramic substrate (600mm^2×0.8mm)	1.3	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 Case Steady State	$R_{\theta JC}$	35.7	°C /W
Junction to Ambient When mounted on ceramic substrate (600mm^2×0.8mm)	$R_{\theta JA}$	96.1	°C /W

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	–60			V
Zero-Gate Voltage Drain Current	I_{DSS}	V_{DS}=–60V, V_{GS}=0V			–1	μA
Gate to Source Leakage Current	I_{GSS}	V_{GS}=±20V, V_{DS}=0V			±10	μA
Gate Threshold Voltage	V_{GS}(th)	V_{DS}=–10V, I_D=–1mA	–1.2		–2.6	V
Forward Transconductance	g_{FS}	V_{DS}=–10V, I_D=–1.5A		3.2		S
Static Drain to Source On-State Resistance	R_{DS}(on)1	I_D=–1.5A, V_{GS}=–10V		200	266	mΩ
	R_{DS}(on)2	I_D=–1A, V_{GS}=–4.5V		245	334	mΩ
	R_{DS}(on)3	I_D=–1A, V_{GS}=–4V		260	374	mΩ
Input Capacitance	Ciss	V_{DS}=–20V, f=1MHz		262		pF
Output Capacitance	Coss			29		pF
Reverse Transfer Capacitance	Crss			19		pF

Continued on next page.

ORDERING INFORMATION

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

Continued from preceding page.

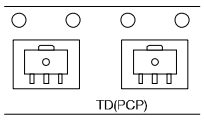
Parameter	Symbol	Conditions	Value			Unit
			min	typ	max	
Turn-ON Delay Time	t_{d}(on)	See specified Test Circuit.		5.1		ns
Rise Time	t_{r}			6.0		ns
Turn-OFF Delay Time	t_{d}(off)			34		ns
Fall Time	t_{f}			21		ns
Total Gate Charge	Qg	V_{DS}=–30V, V_{GS}=–10V, I_{D}=–3A		6.4		nC
Gate to Source Charge	Qgs			0.8		nC
Gate to Drain “Miller” Charge	Qgd			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.

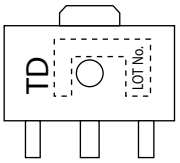
Ordering & Package Information

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

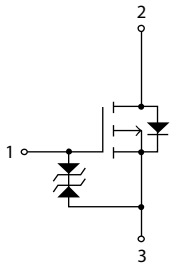
Packing Type:TD



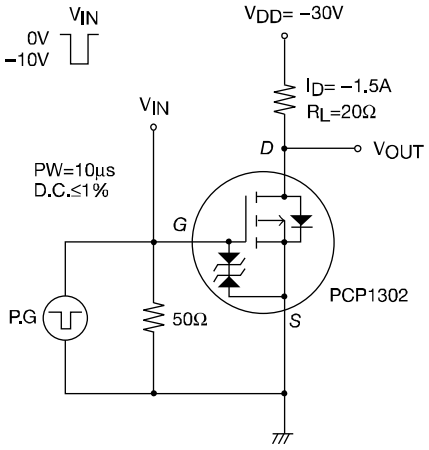
Marking

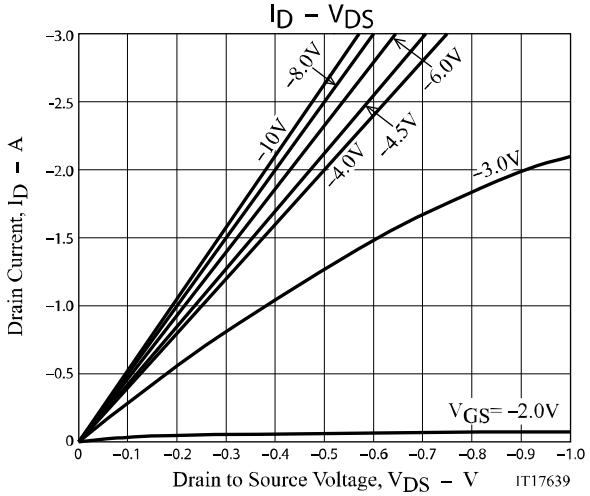


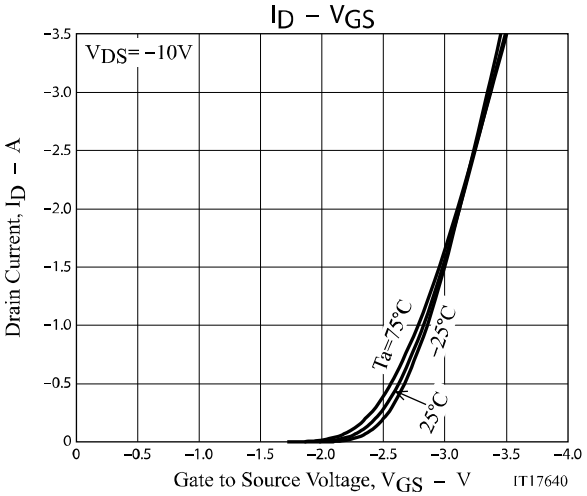
Electrical Connection

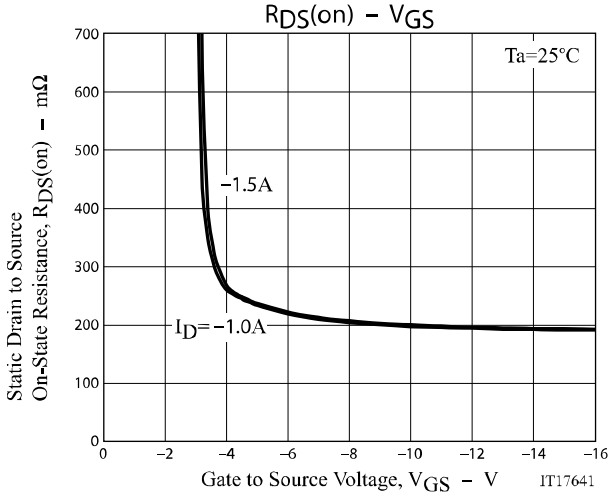


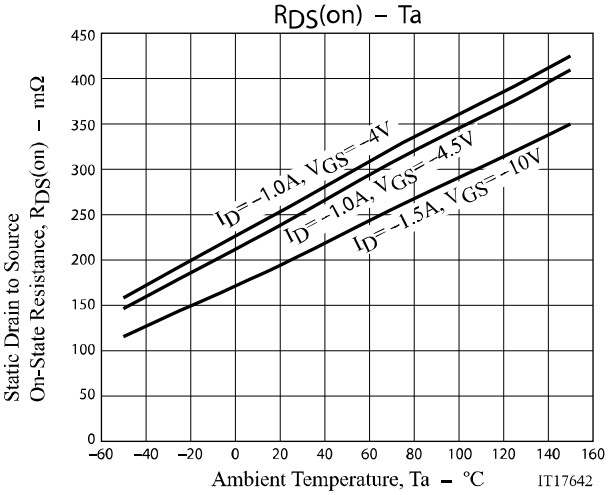
Switching Time Test Circuit

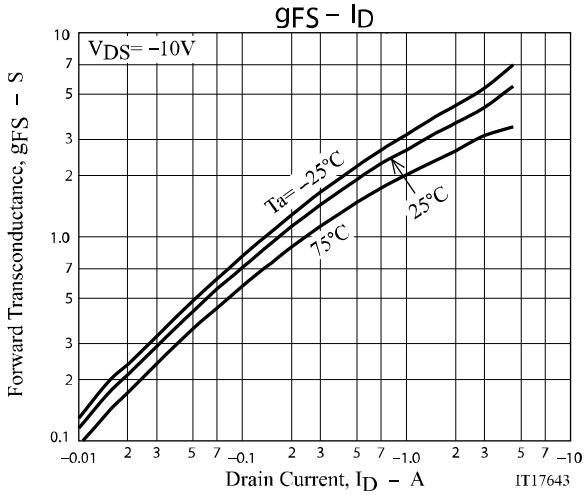


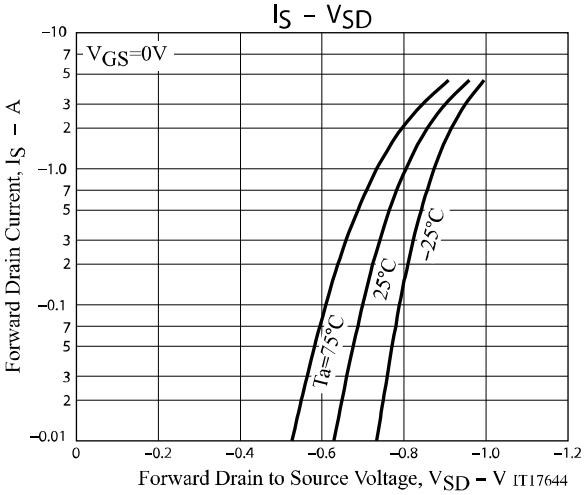

ID – VDS
Drain Current, ID – A
Drain to Source Voltage, VDS – V
IT17639
–8.0V
–6.0V
–10V
–4.5V
–4.0V
–3.0V
VGS= –2.0V

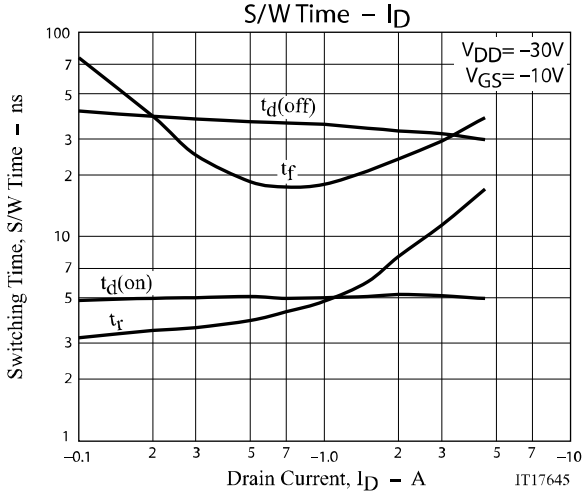

ID – VGS
VDS= –10V
Drain Current, ID – A
Gate to Source Voltage, VGS – V
IT17640
Ta=75°C
–25°C
25°C

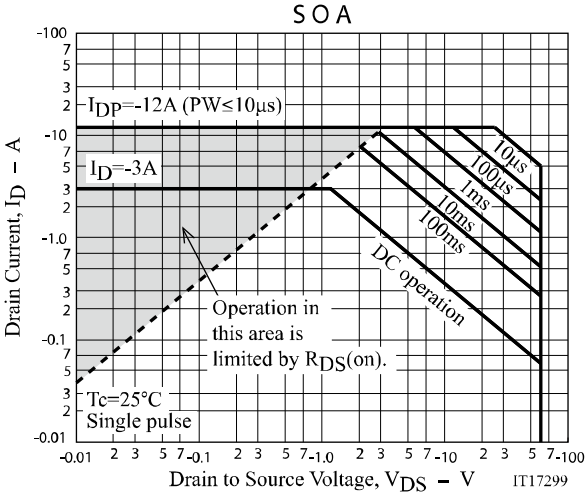

RDS(on) – VGS
Ta=25°C
Static Drain to Source
On-State Resistance, RDS(on) – mΩ
Gate to Source Voltage, VGS – V
IT17641
–1.5A
ID= –1.0A

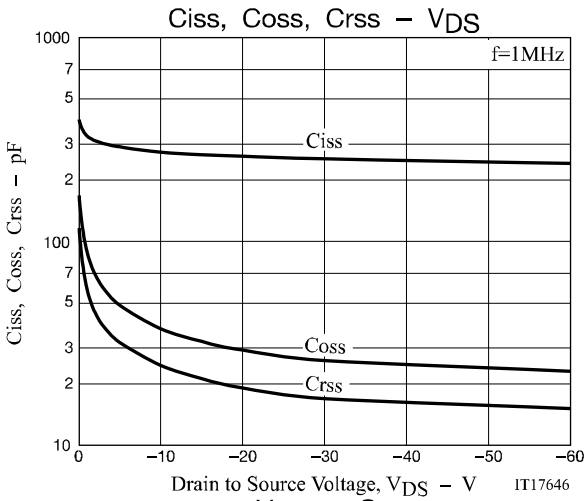

RDS(on) – Ta
Static Drain to Source
On-State Resistance, RDS(on) – mΩ
Ambient Temperature, Ta – °C
IT17642
ID= –1.0A, VGS= –4V
ID= –1.0A, VGS= –4.5V
ID= –1.5A, VGS= –10V

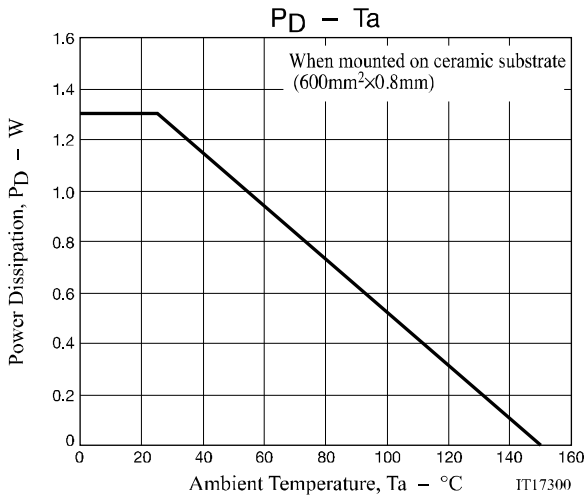

gFS – ID
VDS= –10V
Forward Transconductance, gFS – S
Drain Current, ID – A
IT17643
Ta= –25°C
25°C
75°C

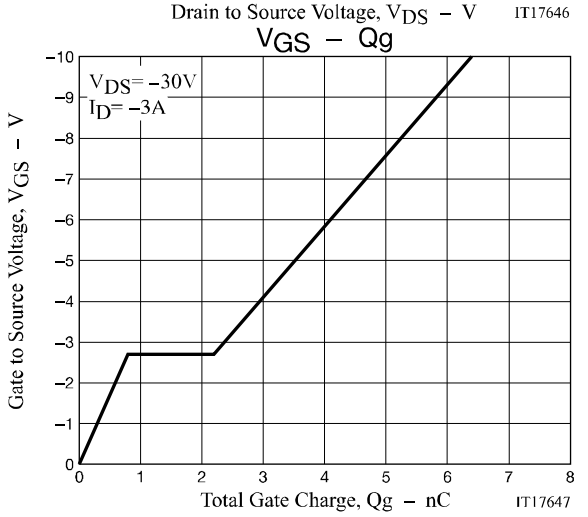

IS – VSD
VGS=0V
Forward Drain Current, IS – A
Forward Drain to Source Voltage, VSD – V
IT17644
Ta=75°C
25°C
–25°C

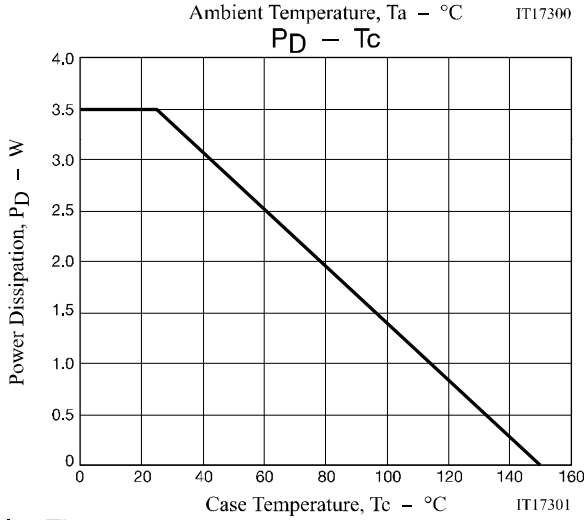

S/W Time – ID
VDD= –30V
VGS= –10V
Switching Time, S/W Time – ns
Drain Current, ID – A
IT17645
td(off)
tf
td(on)
tr

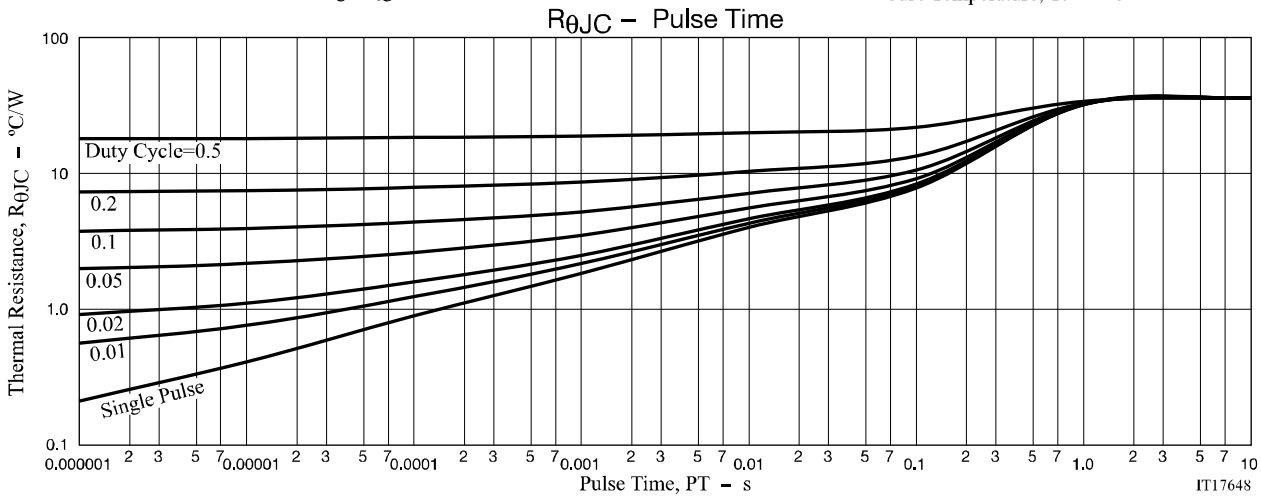

SOA
IDP=-12A (PW≤10μs)
ID=-3A
Drain Current, ID – A
Drain to Source Voltage, VDS – V
IT17299
10μs
100μs
1ms
10ms
100ms
DC operation
Operation in
this area is
limited by RDS(on).
Tc=25°C
Single pulse


Ciss, Coss, Crss – VDS
f=1MHz
Ciss
Coss
Crss
Ciss, Coss, Crss – pF
Drain to Source Voltage, VDS – V
IT17646


PD – Ta
When mounted on ceramic substrate
(600mm²×0.8mm)
Power Dissipation, PD – W
Ambient Temperature, Ta – °C
IT17300


VGS – Qg
VDS= –30V
ID= –3A
Gate to Source Voltage, VGS – V
Total Gate Charge, Qg – nC
IT17647


PD – Tc
Power Dissipation, PD – W
Case Temperature, Tc – °C
IT17301


RθJC – Pulse Time
Duty Cycle=0.5
0.2
0.1
0.05
0.02
0.01
Single Pulse
Thermal Resistance, RθJC – °C/W
Pulse Time, PT – s
IT17648

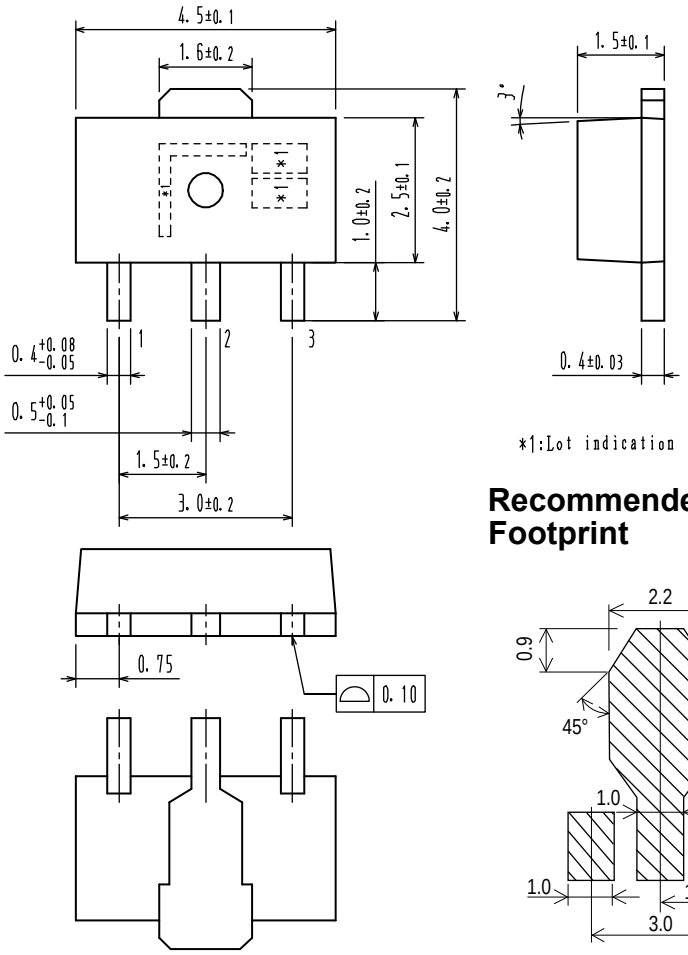
Package Dimensions

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.