Ordering number : ENA2326A

PCP1405

Power MOSFET
250V, 6.5Ω, 0.6A, Single N-Channel

ON Semiconductor®

http://onsemi.com

Features

- On-resistance $R_{DS}(on)1$=5Ω (typ)
- 2.5V drive
- Protection diode in
- Halogen free compliance

Specifications

Absolute Maximum Ratings at Ta = 25°C

Parameter	Symbol	Conditions	Value	Unit
Drain to Source Voltage	V_{DSS}		250	V
Gate to Source Voltage	V_{GSS}		±10	V
Drain to Gate Voltage	V_{DGS}		250	V
Gate to Drain Voltage	V_{GDS}		±10	V
Drain Current (DC)	I_D		0.6	A
Drain Current (Pulse)	I_{DP}	PW≤10μs, duty cycle≤1%	2.4	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	

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	250			V
Zero-Gate Voltage Drain Current	I_{DSS}	V_{DS}=250V, 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=0.3A		1.4		S

Continued on next page.

ORDERING INFORMATION

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

Continued from preceding page.

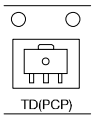
Parameter	Symbol	Conditions	Value			Unit
			min	typ	max	
Static Drain to Source On-State Resistance	$R_{DS}(on)1$	I_D=0.3A, V_{GS}=4.5V		5	6.5	Ω
	$R_{DS}(on)2$	I_D=0.3A, V_{GS}=2.5V		5.1	7.2	Ω
Input Capacitance	Ciss	V_{DS}=20V, f=1MHz		140		pF
Output Capacitance	Coss			8		pF
Reverse Transfer Capacitance	Crss			3		pF
Turn-ON Delay Time	$t_d(on)$	See specified Test Circuit		7.6		ns
Rise Time	t_r			7.8		ns
Turn-OFF Delay Time	$t_d(off)$			19		ns
Fall Time	t_f			26		ns
Total Gate Charge	Qg	V_{DS}=125V, V_{GS}=4.5V, I_D=0.6A		2.1		nC
Gate to Source Charge	Qgs			0.3		nC
Gate to Drain “Miller” Charge	Qgd			0.7		nC
Forward Diode Voltage	V_{SD}	I_S=0.6A, V_{GS}=0V		0.84	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.

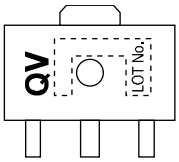
Ordering & Package Information

Device	Package	Shipping	note
PCP1405-TD-H	PCP, SC-62 SOT-89, TO-243	1,000 pcs. / reel	Pb-Free and Halogen Free

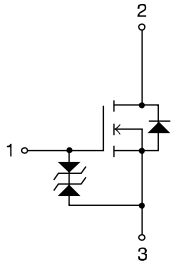
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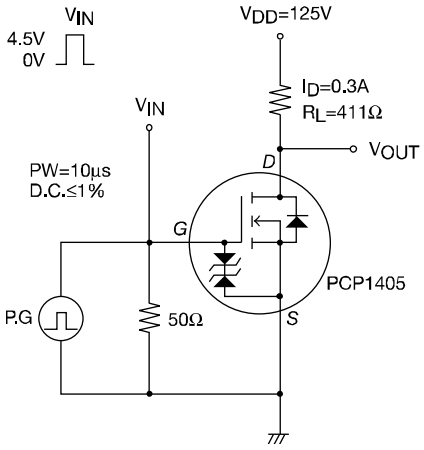
Marking

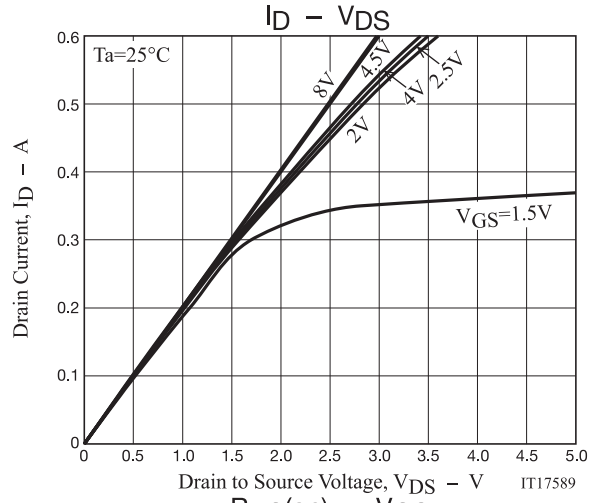


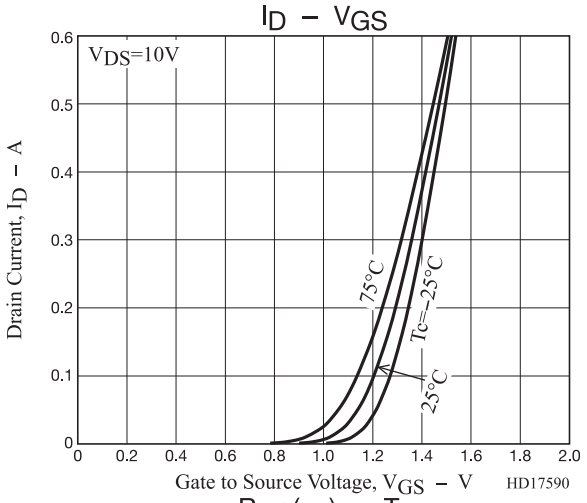
Electrical Connection

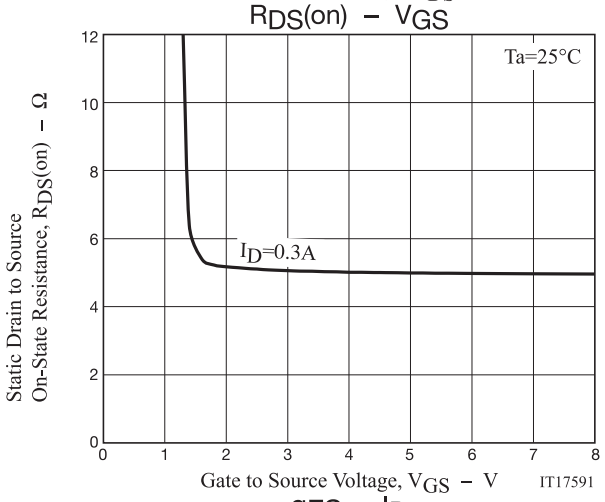


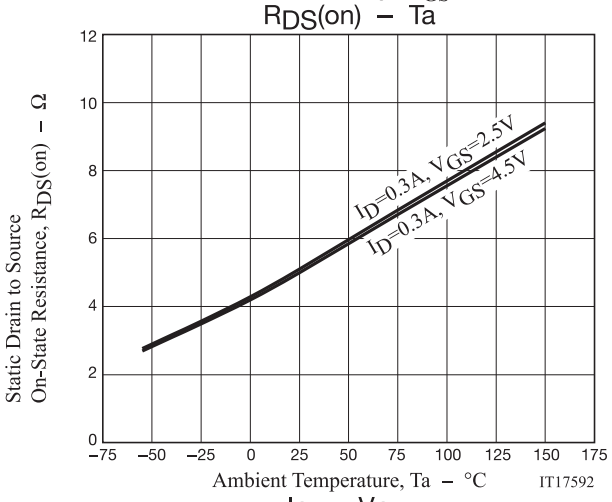
Switching Time Test Circuit

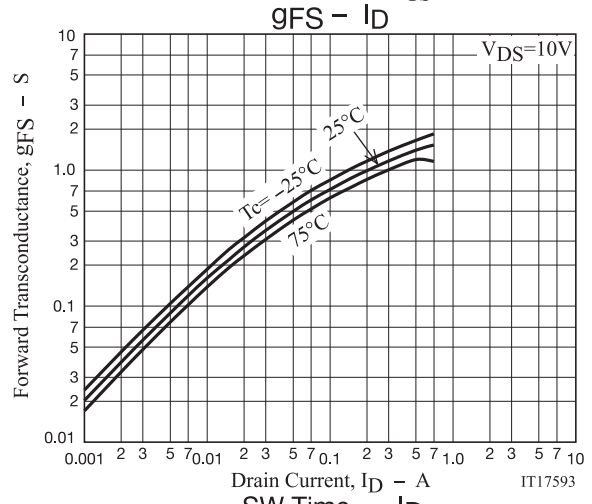


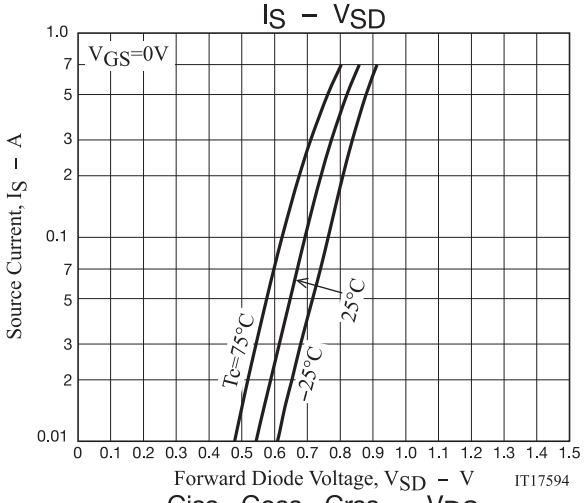

ID – VDS
Ta=25°C
8V
4.5V
4V
2.5V
2V
VGS=1.5V
Drain Current, ID – A
Drain to Source Voltage, VDS – V
IT17589

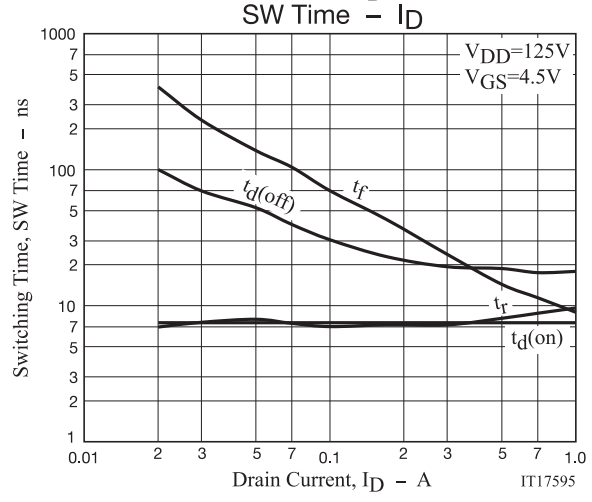

ID – VGS
VDS=10V
75°C
Tc=–25°C
25°C
Drain Current, ID – A
Gate to Source Voltage, VGS – V
HD17590

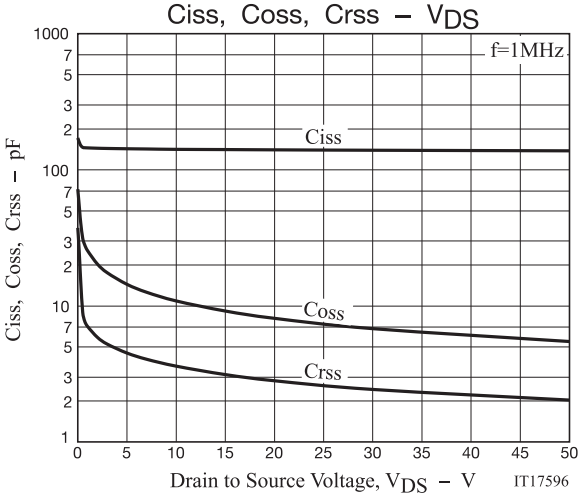

RDS(on) – VGS
Ta=25°C
ID=0.3A
Static Drain to Source
On-State Resistance, RDS(on) – Ω
Gate to Source Voltage, VGS – V
IT17591

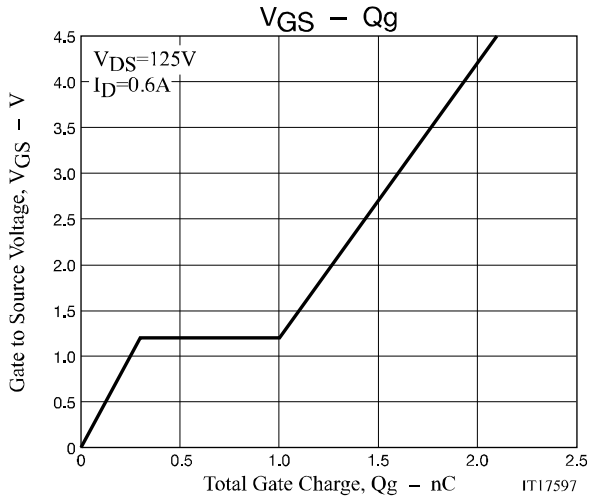

RDS(on) – Ta
ID=0.3A, VGS=2.5V
ID=0.3A, VGS=4.5V
Static Drain to Source
On-State Resistance, RDS(on) – Ω
Ambient Temperature, Ta – °C
IT17592

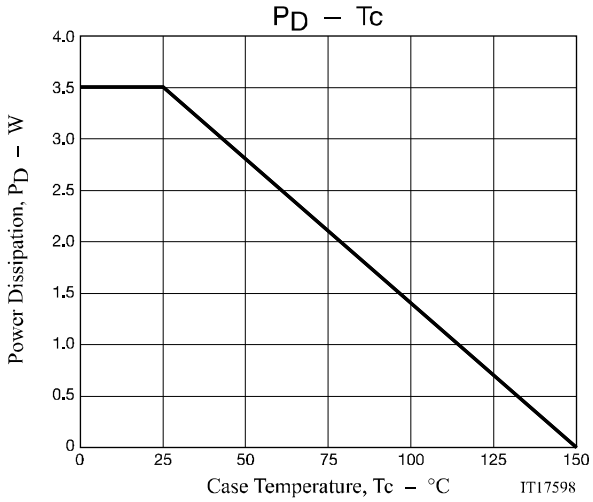

gFS – ID
VDS=10V
25°C
Tc=–25°C
75°C
Forward Transconductance, gFS – S
Drain Current, ID – A
IT17593

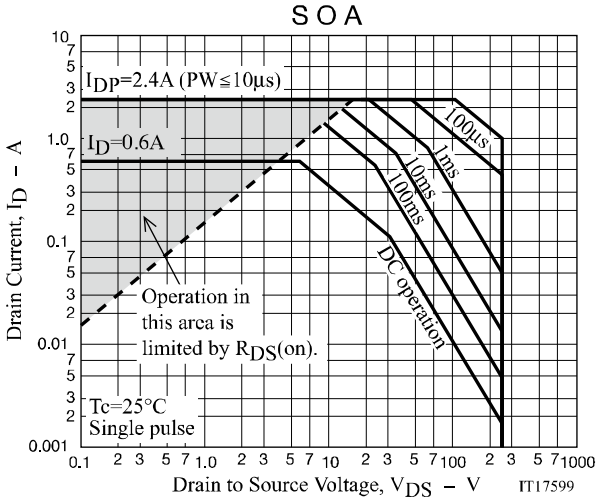

IS – VSD
VGS=0V
Tc=75°C
25°C
–25°C
Source Current, IS – A
Forward Diode Voltage, VSD – V
IT17594

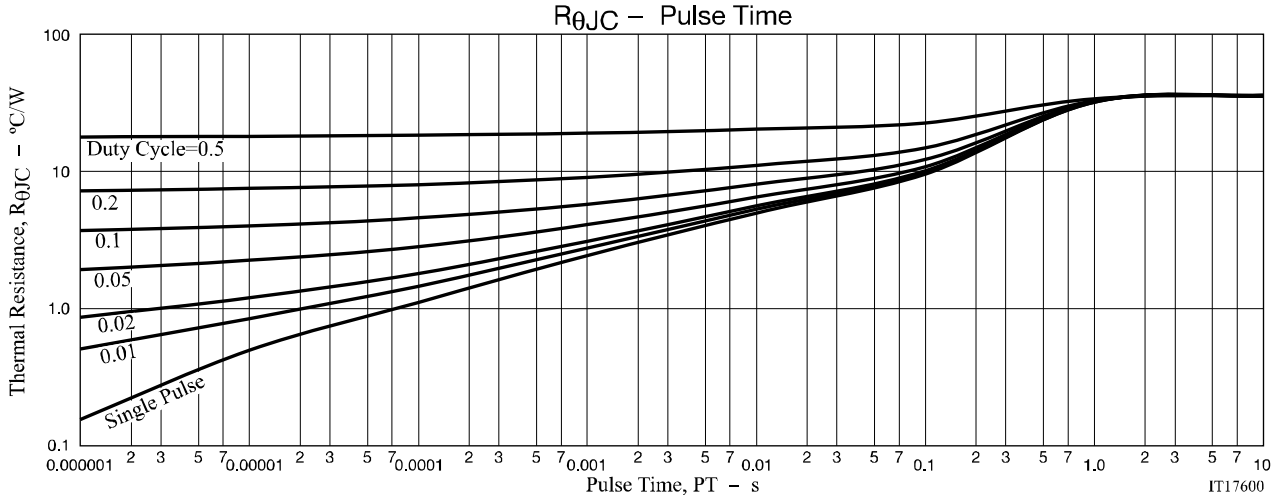

SW Time – ID
VDD=125V
VGS=4.5V
td(off)
tf
tr
td(on)
Switching Time, SW Time – ns
Drain Current, ID – A
IT17595


Ciss, Coss, Crss – VDS
f=1MHz
Ciss
Coss
Crss
Ciss, Coss, Crss – pF
Drain to Source Voltage, VDS – V
IT17596


VGS – Qg
VDS=125V
ID=0.6A
Gate to Source Voltage, VGS – V
Total Gate Charge, Qg – nC
IT17597


PD – Tc
Power Dissipation, PD – W
Case Temperature, Tc – °C
IT17598


SOA
IDP=2.4A (PW≤10μs)
ID=0.6A
100μs
1ms
10ms
100ms
DC operation
Operation in
this area is
limited by RDS(on).
Tc=25°C
Single pulse
Drain Current, ID – A
Drain to Source Voltage, VDS – V
IT17599


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
IT17600

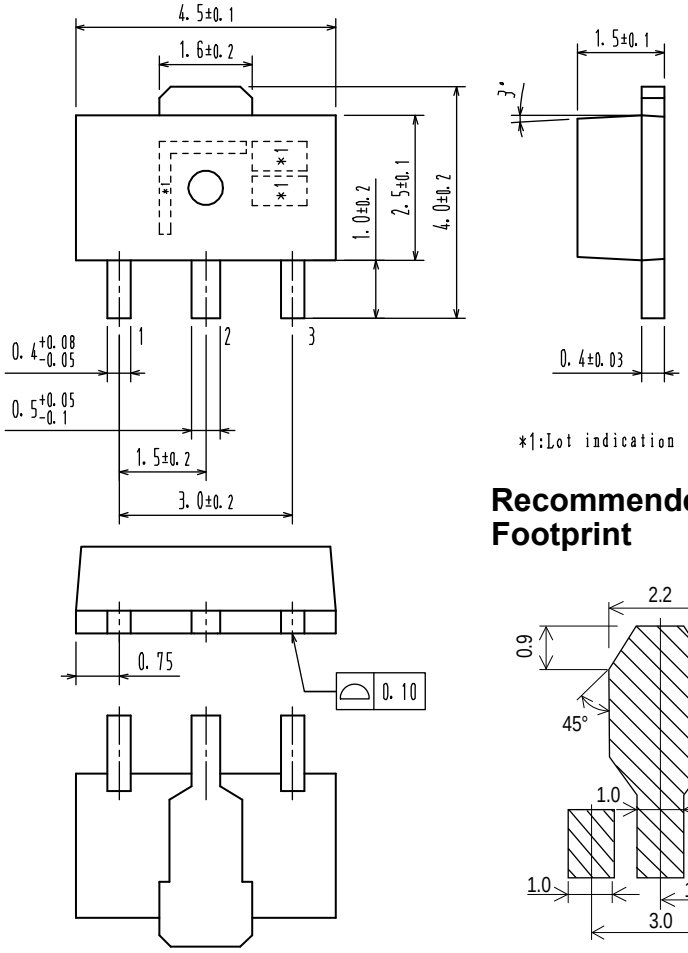
Package Dimensions

PCP1405-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 PCP1405 is a MOSFET product, please avoid using this device in the vicinity of highly charged objects.

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