Ordering number : EN*A0926A

1HP04CH

Advance Information

ON Semiconductor®

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P-Channel Small Signal MOSFET –100V, –170mA, 18Ω, Single CPH3

Features

- 4V 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}		–100	V
Gate to Source Voltage	V_{GSS}		±20	V
Drain Current (DC)	I_D		–170	mA
Drain Current (Pulse)	I_{DP}	PW≤10μs, duty cycle≤1%	–680	mA
Power Dissipation	P_D	When mounted on ceramic substrate (900mm^2×0.8mm)	0.6	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 Ambient When mounted on ceramic substrate (900mm^2×0.8mm)	$R_{\theta JA}$	208	°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	–100			V
Zero-Gate Voltage Drain Current	I_{DSS}	V_{DS}=–100V, V_{GS}=0V			–1	μA
Gate to Source Leakage Current	I_{GSS}	V_{GS}=±16V, V_{DS}=0V			±10	μA
Gate Threshold Voltage	$V_{GS}(th)$	V_{DS}=–10V, I_D=–100μA	–1.2		–2.6	V
Forward Transconductance	g_{FS}	V_{DS}=–10V, I_D=–80mA		170		mS
Static Drain to Source On-State Resistance	$R_{DS}(on)1$	I_D=–80mA, V_{GS}=–10V		12.5	18	Ω
	$R_{DS}(on)2$	I_D=–40mA, V_{GS}=–4V		14	21	Ω
Input Capacitance	Ciss	V_{DS}=–20V, f=1MHz		14		pF
Output Capacitance	Coss			2.8		pF
Reverse Transfer Capacitance	Crss			0.9		pF

Continued on next page.

This document contains information on a new product. Specifications and information herein are subject to change without notice.

ORDERING INFORMATION

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

Continued from preceding page.

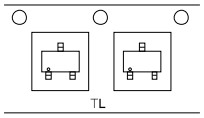
Parameter	Symbol	Conditions	Value			Unit
			min	typ	max	
Turn-ON Delay Time	t_{d}(on)	See specified Test Circuit		21		ns
Rise Time	t_{r}			18		ns
Turn-OFF Delay Time	t_{d}(off)			200		ns
Fall Time	t_{f}			81		ns
Total Gate Charge	Qg	V_{DS}=–50V, V_{GS}=–10V, I_{D}=–170mA		0.9		nC
Gate to Source Charge	Qgs			0.14		nC
Gate to Drain “Miller” Charge	Qgd			0.27		nC
Forward Diode Voltage	V_{SD}	I_{S}=–170mA, V_{GS}=0V		–0.88	–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.

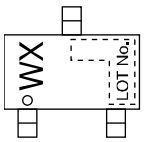
Ordering & Package Information

Device	Package	Shipping	note
1HP04CH-TL-W	CPH3, SC-59 SOT-23, TO-236	3,000 pcs. / reel	Pb-Free and Halogen Free

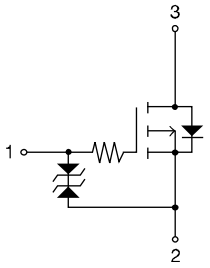
Packing Type:TL



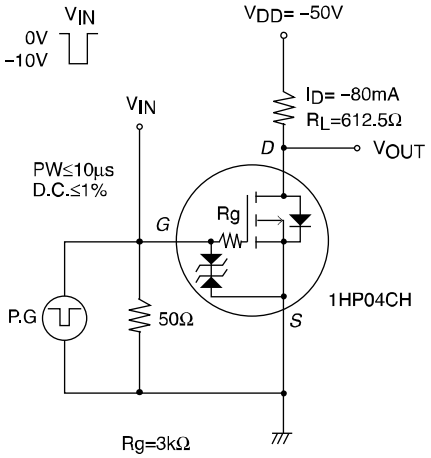
Marking

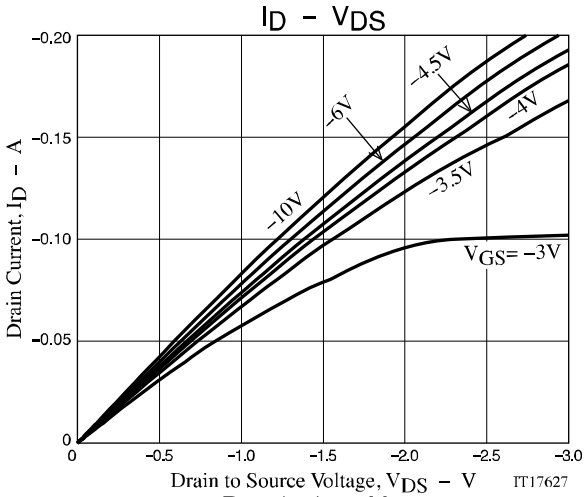


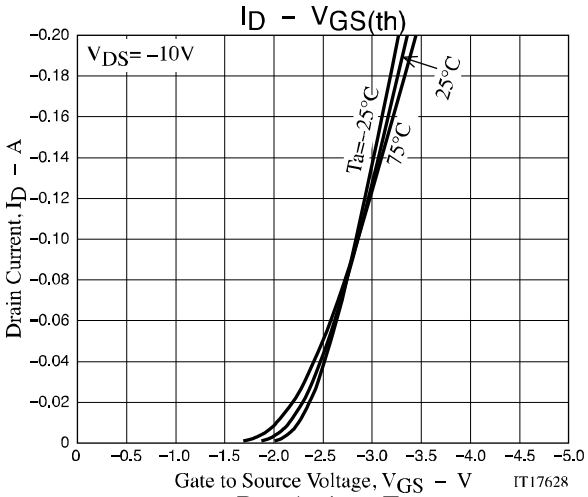
Electrical Connection

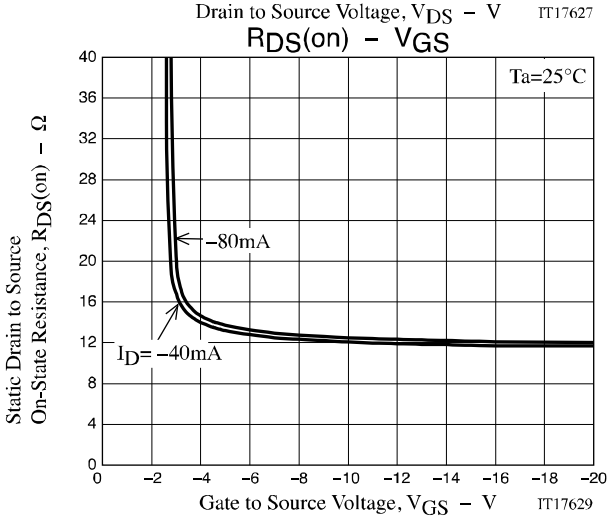


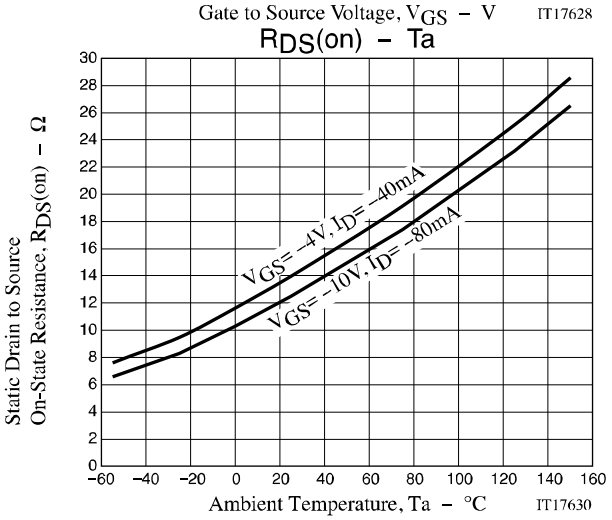
Switching Time Test Circuit

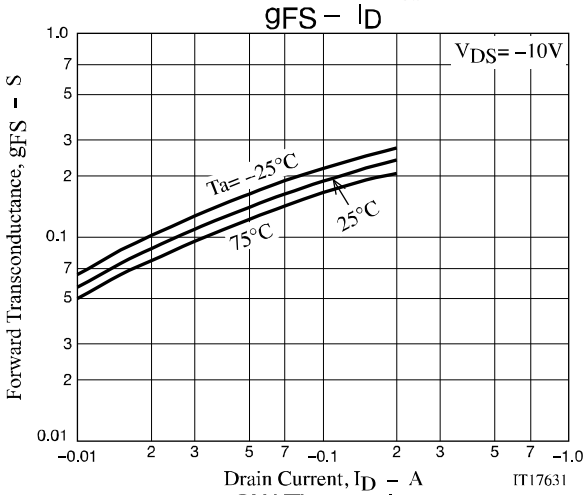


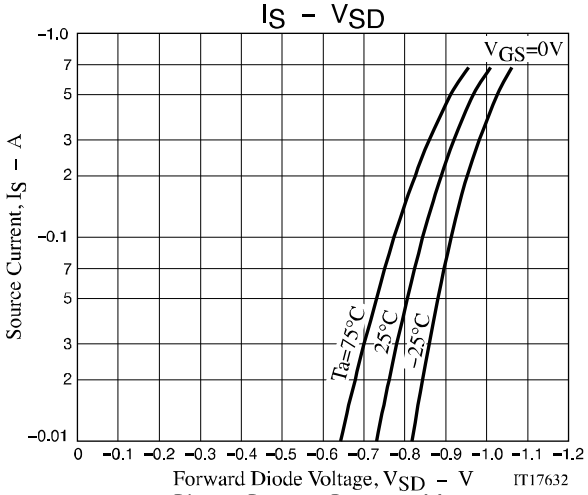

ID – VDS
Drain Current, ID – A
Drain to Source Voltage, VDS – V
IT17627
–4.5V
–6V
–4V
–3.5V
–10V
VGS= –3V

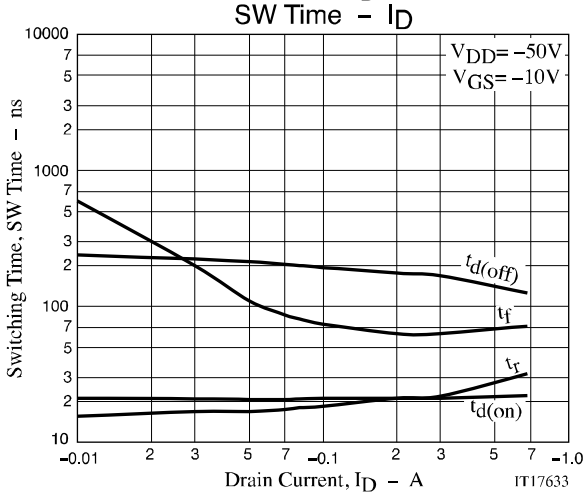

ID – VGS(th)
VDS= –10V
Drain Current, ID – A
Gate to Source Voltage, VGS – V
IT17628
Ta=–25°C
75°C
25°C

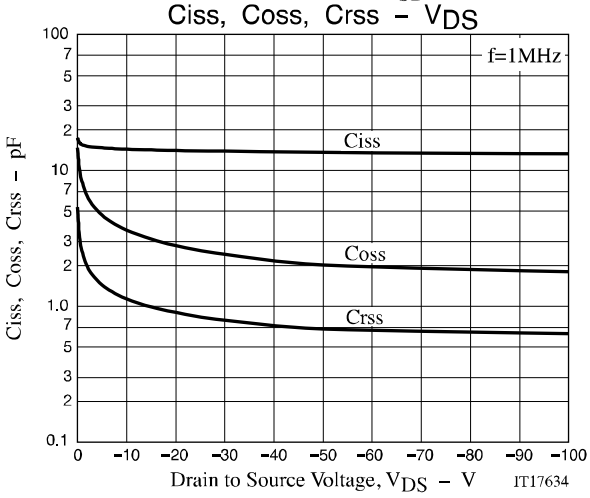

RDS(on) – VGS
Ta=25°C
Static Drain to Source
On-State Resistance, RDS(on) – Ω
Gate to Source Voltage, VGS – V
IT17629
–80mA
ID= –40mA

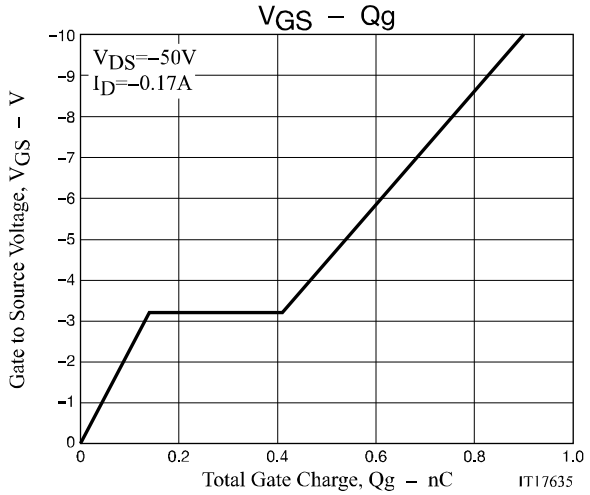

RDS(on) – Ta
Static Drain to Source
On-State Resistance, RDS(on) – Ω
Ambient Temperature, Ta – °C
IT17630
VGS= –4V, ID= –40mA
VGS= –10V, ID= –80mA

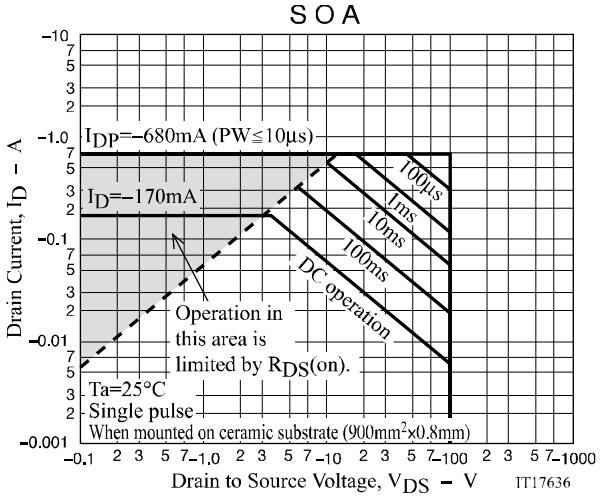

gFS – ID
VDS= –10V
Forward Transconductance, gFS – S
Drain Current, ID – A
IT17631
Ta= –25°C
75°C
25°C

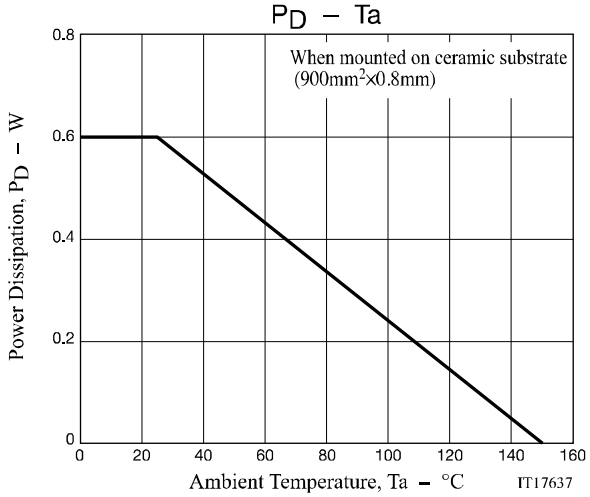

IS – VSD
VGS=0V
Source Current, IS – A
Forward Diode Voltage, VSD – V
IT17632
Ta=75°C
25°C
–25°C

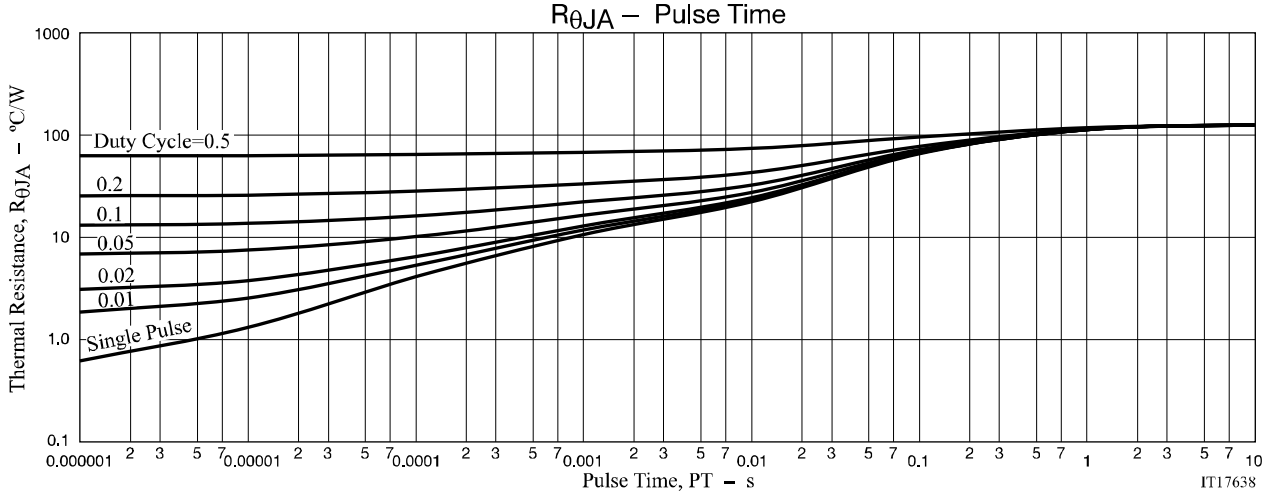

SW Time – ID
VDD= –50V
VGS= –10V
Switching Time, SW Time – ns
Drain Current, ID – A
IT17633
td(off)
tf
tr
td(on)


Ciss, Coss, Crss – VDS
f=1MHz
Ciss, Coss, Crss – pF
Drain to Source Voltage, VDS – V
IT17634
Ciss
Coss
Crss


VGS – Qg
VDS=–50V
ID=–0.17A
Gate to Source Voltage, VGS – V
Total Gate Charge, Qg – nC
IT17635


S O A
IDP=–680mA (PW≤10μs)
ID=–170mA
100μs
1ms
10ms
100ms
DC operation
Operation in
this area is
limited by RDS(on).
Ta=25°C
Single pulse
When mounted on ceramic substrate (900mm2×0.8mm)
Drain Current, ID – A
Drain to Source Voltage, VDS – V
IT17636


PD – Ta
When mounted on ceramic substrate
(900mm2×0.8mm)
Power Dissipation, PD – W
Ambient Temperature, Ta – °C
IT17637


RθJA – Pulse Time
Duty Cycle=0.5
0.2
0.1
0.05
0.02
0.01
Single Pulse
Thermal Resistance, RθJA – °C/W
Pulse Time, PT – s
IT17638

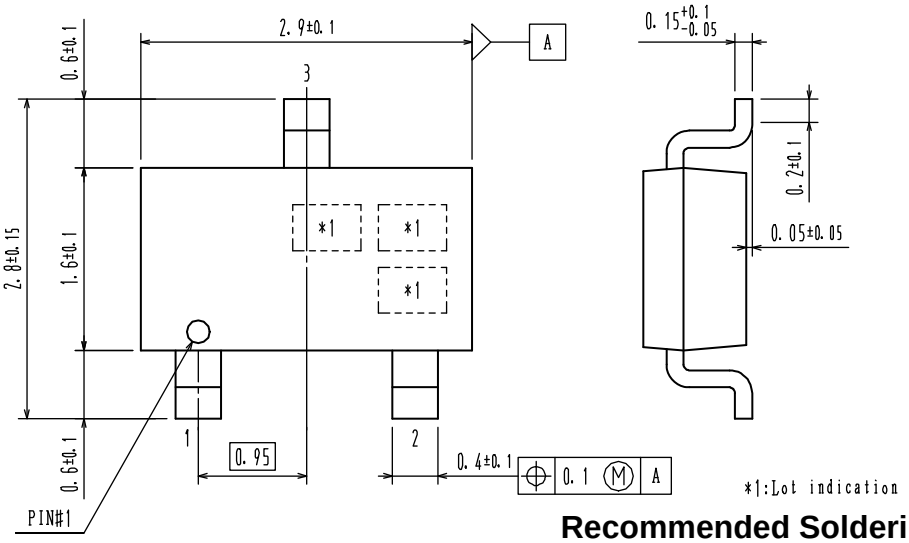
Package Dimensions

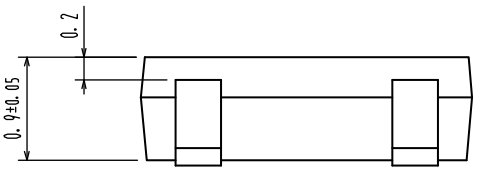
1HP04CH-TL-W

CPH3

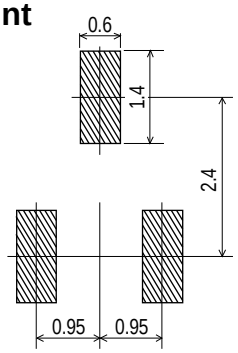
CASE 318BA
ISSUE O
unit : mm

1: Gate
2: Source
3: Drain





Recommended Soldering Footprint



Note on usage : Since the 1HP04CH is a MOSFET product, please avoid using this device in the vicinity of highly charged objects.