CPH3461

Power MOSFET
250V, 6.5Ω, 350mA, Single N-Channel

ON Semiconductor®

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Features

- On-Resistance $R_{DS}(on)1$=5Ω (typ)
- 2.5V Drive
- Pb-Free, Halogen Free and RoHS Compliance
- ESD Diode - Protected Gate
- Low Ciss and High Speed Switching

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		350	mA
Drain Current (Pulse)	I_{DP}	PW≤10μs, duty cycle≤1%	1.4	A
Power Dissipation	P_D	When mounted on ceramic substrate (900mm^2 × 0.8mm)	1.0	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)	$R_{\theta JA}$	125	°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	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=170mA		1		S
Static Drain to Source On-State Resistance	$R_{DS}(on)1$	I_D=170mA, V_{GS}=4.5V		5	6.5	Ω
	$R_{DS}(on)2$	I_D=170mA, V_{GS}=2.5V		5.1	7.2	Ω

Continued on next page.

ORDERING INFORMATION

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

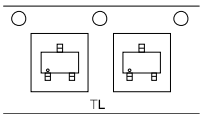
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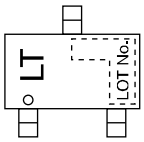
Parameter	Symbol	Conditions	Value			Unit
			min	typ	max	
Input Capacitance	Ciss	V_{DS}=20V, f=1MHz		140		pF
Output Capacitance	Coss			8		pF
Reverse Transfer Capacitance	Crss			3		pF
Turn-ON Delay Time	t_{d}(on)	See specified Test Circuit		7.5		ns
Rise Time	t_{r}			7.3		ns
Turn-OFF Delay Time	t_{d}(off)			23		ns
Fall Time	t_{f}			43		ns
Total Gate Charge	Qg	V_{DS}=125V, V_{GS}=4.5V, I_{D}=350mA		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}=350mA, V_{GS}=0V		0.79	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.

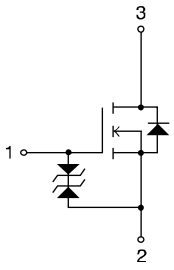
Packing Type : TL



Marking

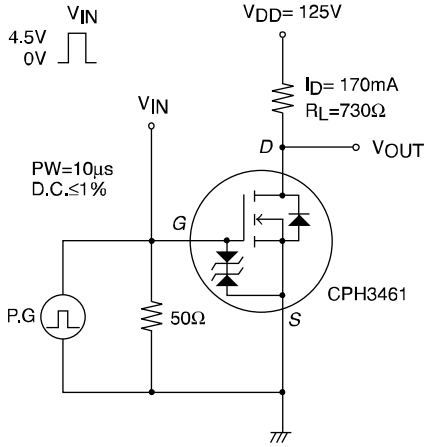


Electrical Connection



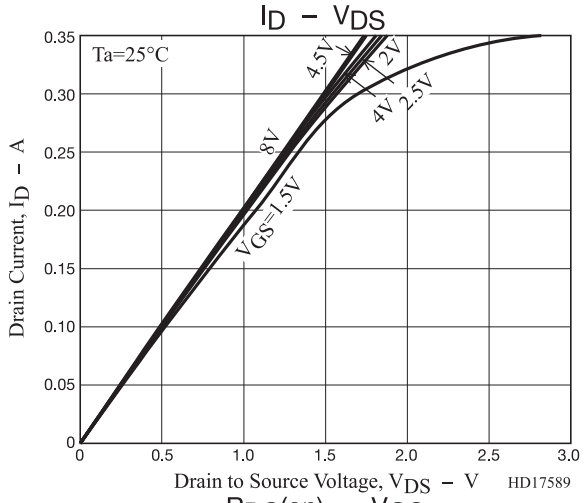
1 : Gate
2 : Source
3 : Drain

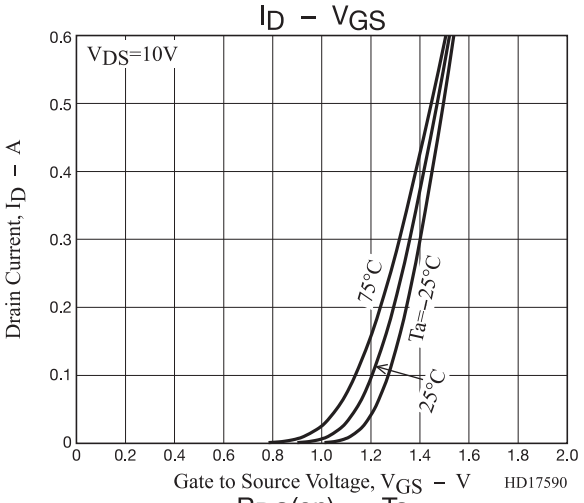
Switching Time Test Circuit

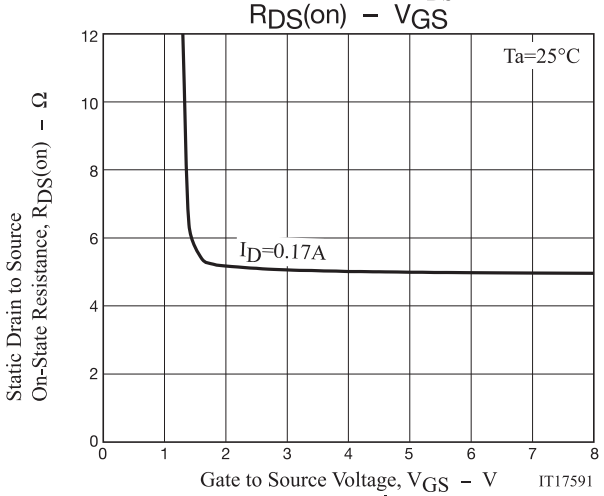


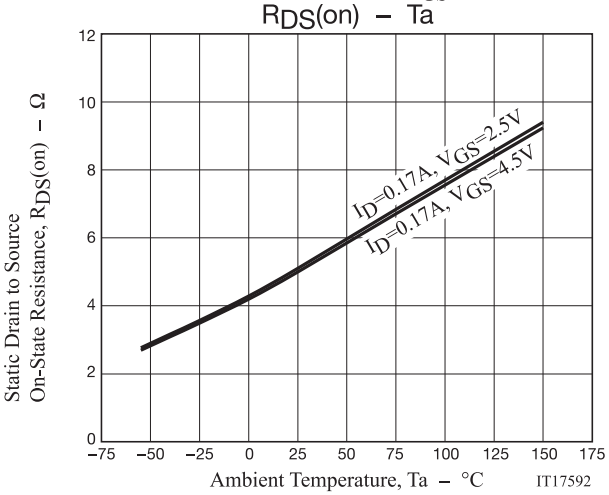
ORDERING INFORMATION

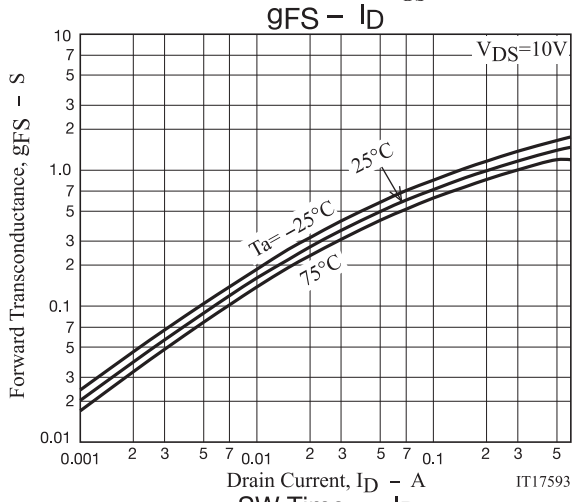
Device	Package	Shipping	Note
CPH3461-TL-H	CPH3,SC-59 SOT-23,TO-236	3,000pcs. / Tape & Reel	Pb-Free and Halogen Free
CPH3461-TL-W			

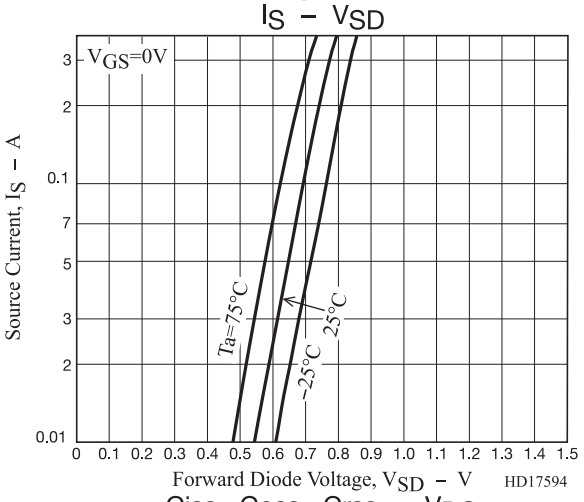

ID – VDS
Ta=25°C
4.5V
4V
2.5V
2V
8V
VGS=1.5V
Drain Current, ID – A
Drain to Source Voltage, VDS – V
HD17589

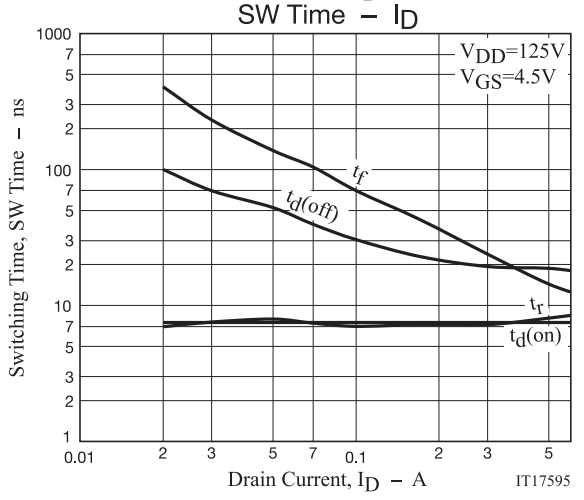

ID – VGS
VDS=10V
75°C
Ta=–25°C
25°C
Drain Current, ID – A
Gate to Source Voltage, VGS – V
HD17590

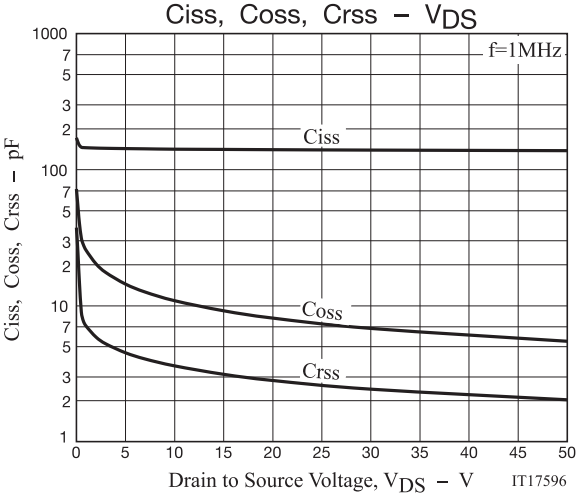

RDS(on) – VGS
Ta=25°C
ID=0.17A
Static Drain to Source
On-State Resistance, RDS(on) – Ω
Gate to Source Voltage, VGS – V
IT17591

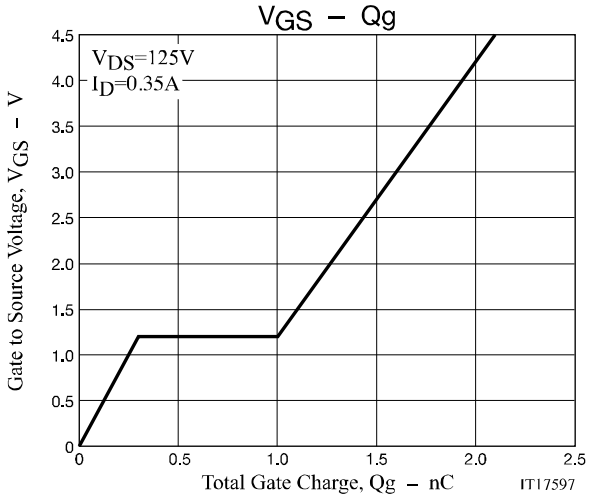

RDS(on) – Ta
ID=0.17A, VGS=2.5V
ID=0.17A, VGS=4.5V
Static Drain to Source
On-State Resistance, RDS(on) – Ω
Ambient Temperature, Ta – °C
IT17592

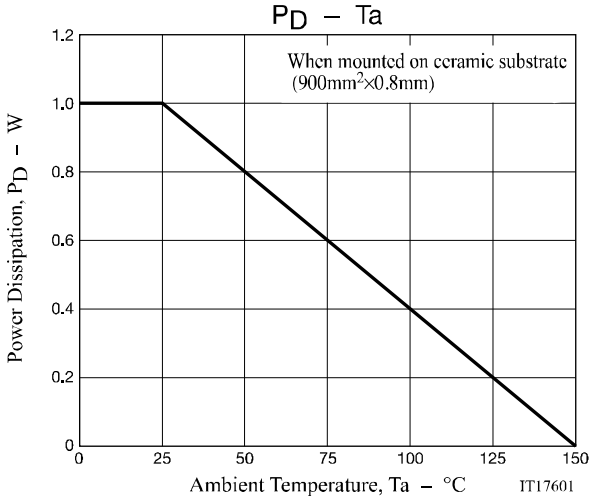

gFS – ID
VDS=10V
25°C
Ta=–25°C
75°C
Forward Transconductance, gFS – S
Drain Current, ID – A
IT17593

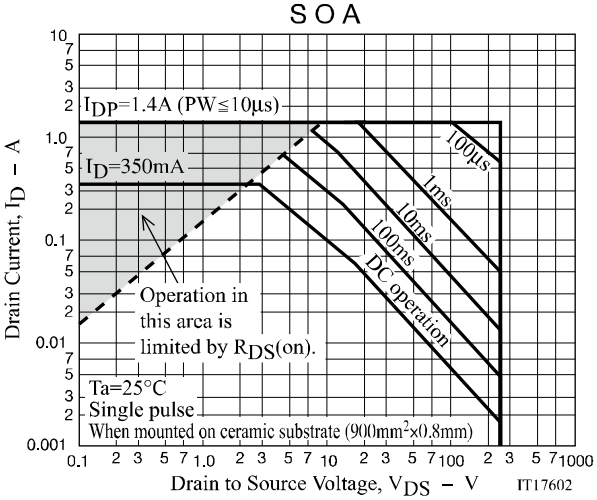

IS – VSD
VGS=0V
Ta=75°C
25°C
–25°C
Source Current, IS – A
Forward Diode Voltage, VSD – V
HD17594

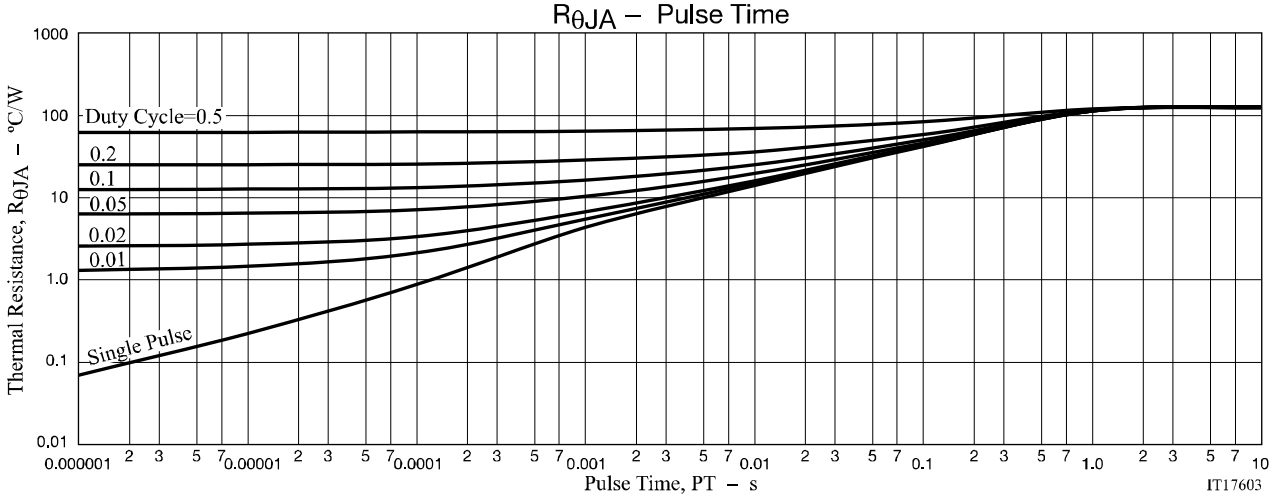

SW Time – ID
VDD=125V
VGS=4.5V
tf
td(off)
tr
td(on)
Switching Time, SW Time – ns
Drain Current, ID – A
IT17595


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=0.35A
Gate to Source Voltage, VGS – V
Total Gate Charge, Qg – nC
IT17597


PD – Ta
When mounted on ceramic substrate
(900mm2×0.8mm)
Power Dissipation, PD – W
Ambient Temperature, Ta – °C
IT17601


SOA
IDP=1.4A (PW≤10μs)
ID=350mA
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
IT17602


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
IT17603

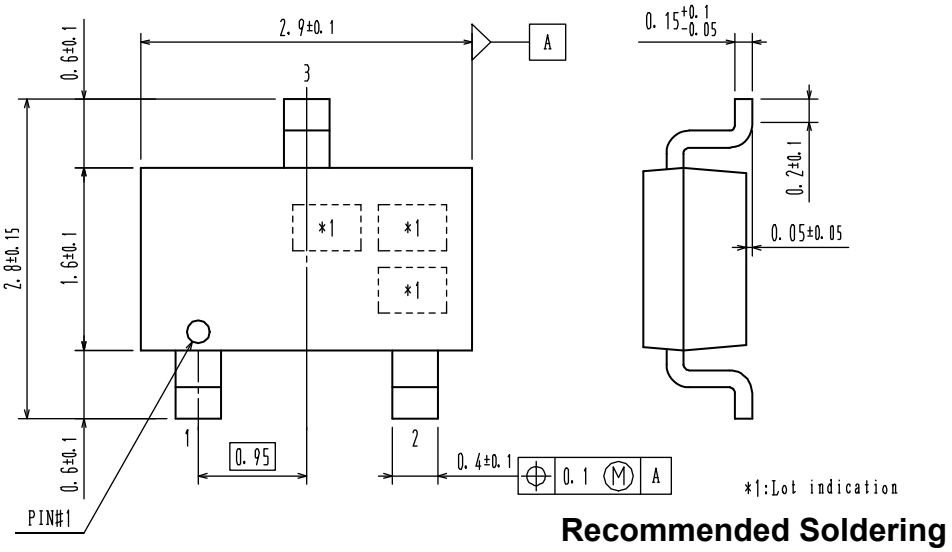
Package Dimensions

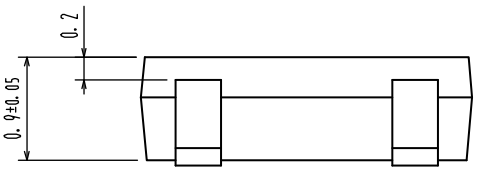
CPH3461-TL-H, CPH3461-TL-W

CPH3

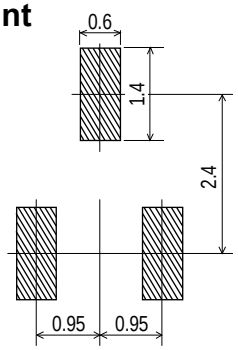
CASE 318BA
ISSUE O
unit : mm

1: Gate
2: Source
3: Drain





Recommended Soldering Footprint



Note on usage : Since the CPH3461 is a MOSFET product, please avoid using this device in the vicinity of highly charged objects.

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