Ordering number : ENN8069

SANYO Semiconductors
DATA SHEET

N-Channel and P-Channel Silicon MOSFETs

CPH6615 — General-Purpose Switching Device Applications

Features

- The CPH6615 incorporates a N-channel MOSFET and a P-channel MOSFET that feature low ON-resistance, Ultrahigh-speed switching, thereby enabling high-density mounting.
- Excellent ON-resistance characteristic.
- Best suited for load switches.
- 4V drive.

Specifications

Absolute Maximum Ratings at Ta=25°C

Parameter	Symbol	Conditions	N-channel	P-channel	Unit
Drain-to-Source Voltage	V_{DSS}		30	−30	V
Gate-to-Source Voltage	V_{GSS}		±20	±20	V
Drain Current (DC)	I_D		2.5	−1.8	A
Drain Current (Pulse)	I_{DP}	PW≤10μs, duty cycle≤1%	10	−7.2	A
Allowable Power Dissipation	P_D	Mounted on a ceramic board (900mm²X0.8mm)1unit	0.9		W
Channel Temperature	Tch		150		°C
Storage Temperature	Tstg		−55 to +150		°C

Electrical Characteristics at Ta=25°C

Parameter	Symbol	Conditions	Ratings			Unit
			min	typ	max	
[N-channel]						
Drain-to-Source Breakdown Voltage	$V_{(BR)DSS}$	I_D=1mA, V_{GS}=0	30			V
Zero-Gate Voltage Drain Current	I_{DSS}	V_{DS}=30V, V_{GS}=0			1	μA
Gate-to-Source Leakage Current	I_{GSS}	V_{GS}=±16V, V_{DS}=0			±10	μA
Cutoff Voltage	V_{GS}(off)	V_{DS}=10V, I_D=1mA	1.2		2.6	V
Forward Transfer Admittance	$\|yfs\|$	V_{DS}=10V, I_D=1.5A	1.2	2.0		S
Static Drain-to-Source On-State Resistance	R_{DS}(on)1	I_D=1.5A, V_{GS}=10V		79	105	mΩ
	R_{DS}(on)2	I_D=1A, V_{GS}=4V		150	210	mΩ
Input Capacitance	Ciss	V_{DS}=10V, f=1MHz		187		pF
Output Capacitance	Coss	V_{DS}=10V, f=1MHz		40		pF
Reverse Transfer Capacitance	Crss	V_{DS}=10V, f=1MHz		33		pF

Marking : WB

Continued on next page.

SANYO Electric Co.,Ltd. Semiconductor Company
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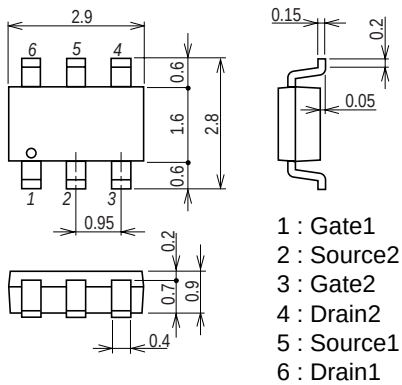
Continued from preceding page.

Parameter	Symbol	Conditions	Ratings			Unit
			min	typ	max	
Turn-ON Delay Time	$t_{d(on)}$	See specified Test Circuit.		7.8		ns
Rise Time	t_r	See specified Test Circuit.		18.5		ns
Turn-OFF Delay Time	$t_{d(off)}$	See specified Test Circuit.		22		ns
Fall Time	t_f	See specified Test Circuit.		12		ns
Total Gate Charge	Qg	V_{DS}=10V, V_{GS}=10V, I_D=2.5A		5.2		nC
Gate-to-Source Charge	Qgs	V_{DS}=10V, V_{GS}=10V, I_D=2.5A		1		nC
Gate-to-Drain “Miller” Charge	Qgd	V_{DS}=10V, V_{GS}=10V, I_D=2.5A		0.97		nC
Diode Forward Voltage	V_{SD}	I_S=2.5A, V_{GS}=0		0.9	1.2	V
[P-channel]						
Drain-to-Source Breakdown Voltage	$V_{(BR)DSS}$	I_D=–1mA, V_{GS}=0	–30			V
Zero-Gate Voltage Drain Current	I_{DSS}	V_{DS}=–30V, V_{GS}=0			–1	μA
Gate-to-Source Leakage Current	I_{GSS}	V_{GS}=±16V, V_{DS}=0			±10	μA
Cutoff Voltage	$V_{GS(off)}$	V_{DS}=–10V, I_D=–1mA	–1.2		–2.6	V
Forward Transfer Admittance	$\|yfs\|$	V_{DS}=–10V, I_D=–1A	1.1	1.8		S
Static Drain-to-Source On-State Resistance	$R_{DS(on)1}$	I_D=–1A, V_{GS}=–10V		180	235	mΩ
	$R_{DS(on)2}$	I_D=–0.5A, V_{GS}=–4V		320	450	mΩ
Input Capacitance	Ciss	V_{DS}=–10V, f=1MHz		226		pF
Output Capacitance	Coss	V_{DS}=–10V, f=1MHz		43		pF
Reverse Transfer Capacitance	Crss	V_{DS}=–10V, f=1MHz		36		pF
Turn-ON Delay Time	$t_{d(on)}$	See specified Test Circuit.		8.5		ns
Rise Time	t_r	See specified Test Circuit.		10.5		ns
Turn-OFF Delay Time	$t_{d(off)}$	See specified Test Circuit.		29		ns
Fall Time	t_f	See specified Test Circuit.		22		ns
Total Gate Charge	Qg	V_{DS}=–10V, V_{GS}=–10V, I_D=–1.8A		5.5		nC
Gate-to-Source Charge	Qgs	V_{DS}=–10V, V_{GS}=–10V, I_D=–1.8A		1		nC
Gate-to-Drain “Miller” Charge	Qgd	V_{DS}=–10V, V_{GS}=–10V, I_D=–1.8A		0.97		nC
Diode Forward Voltage	V_{SD}	I_S=–1.8A, V_{GS}=0		–0.91	–1.5	V

Package Dimensions

unit : mm

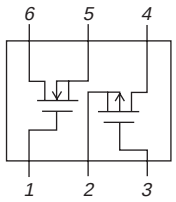
2238



1 : Gate1
2 : Source2
3 : Gate2
4 : Drain2
5 : Source1
6 : Drain1

SANYO : CPH6

Electrical Connection

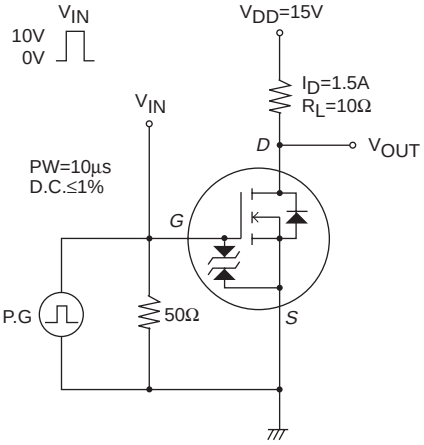


1 : Gate1
2 : Source2
3 : Gate2
4 : Drain2
5 : Source1
6 : Drain1

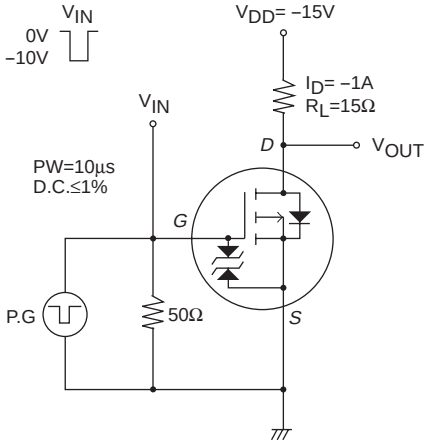
Top view

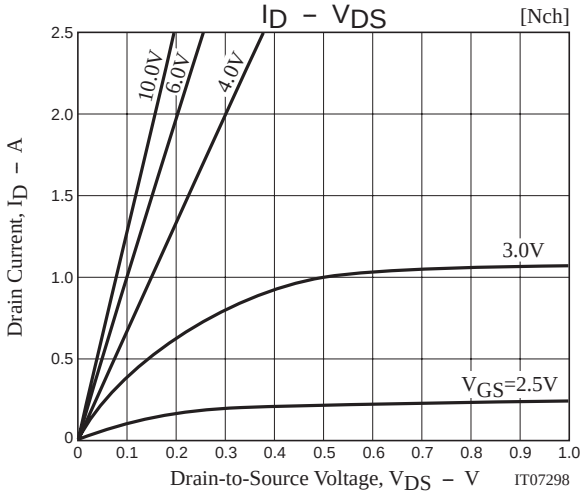
Switching Time Test Circuit

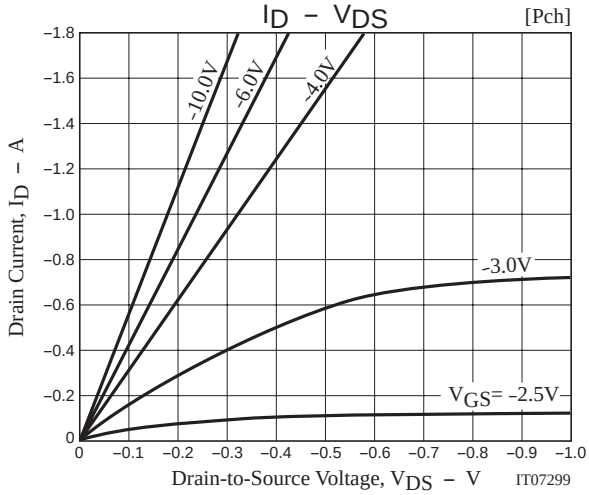
[N-channel]

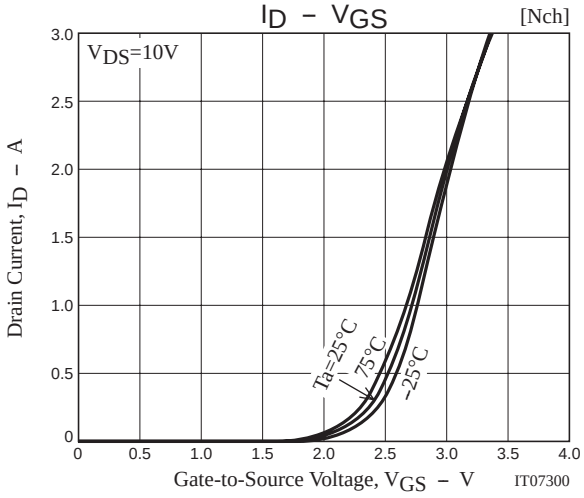


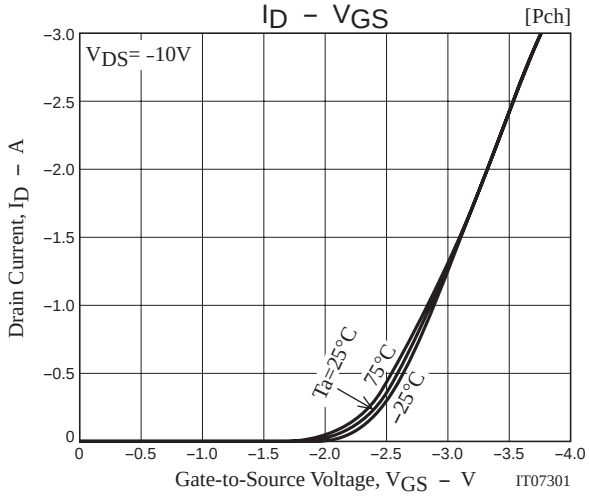
[P-channel]

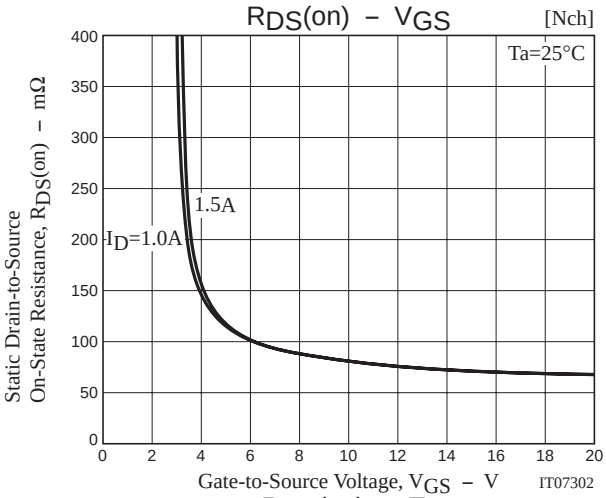


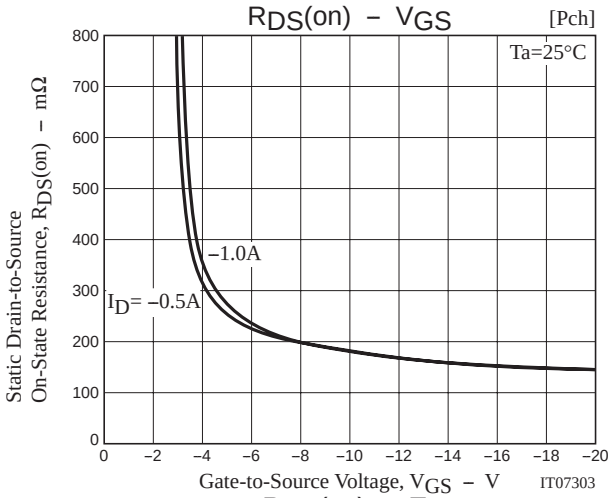


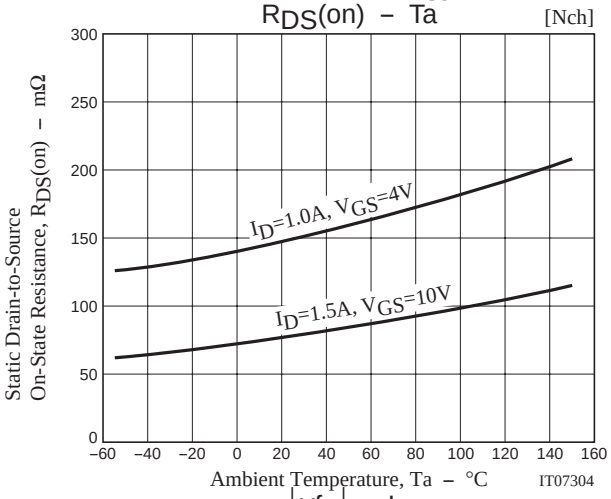


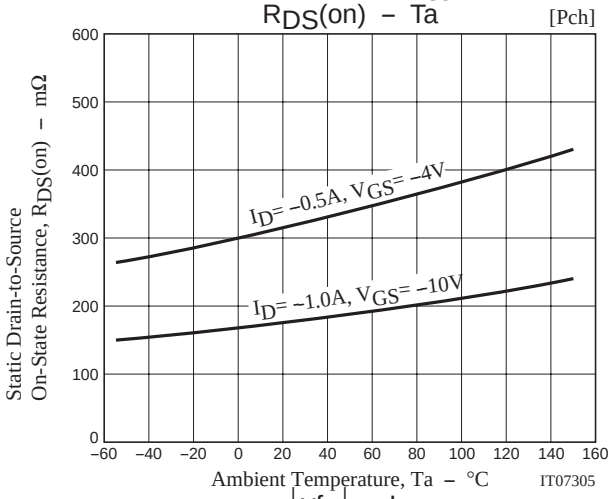


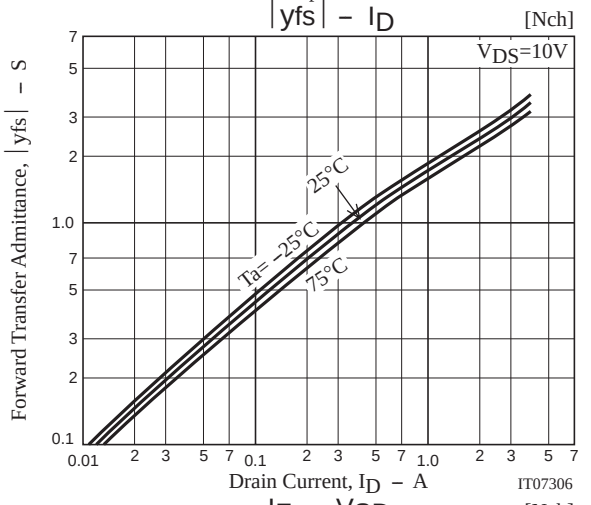


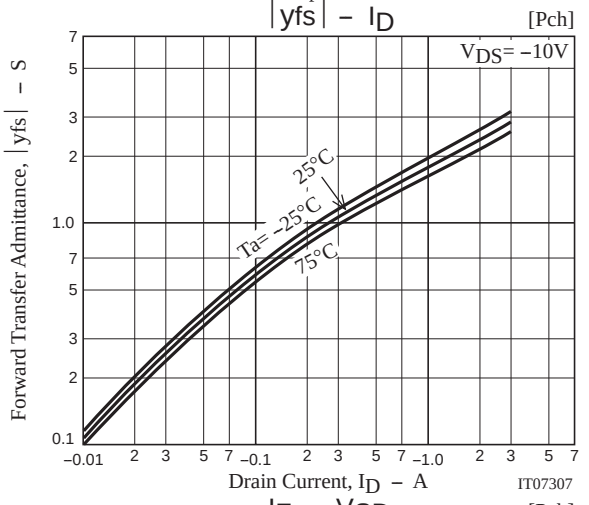

RDS(on) – VGS
[Nch]
Ta=25°C
1.5A
ID=1.0A
Static Drain-to-Source On-State Resistance, RDS(on) – mΩ
Gate-to-Source Voltage, VGS – V
IT07302

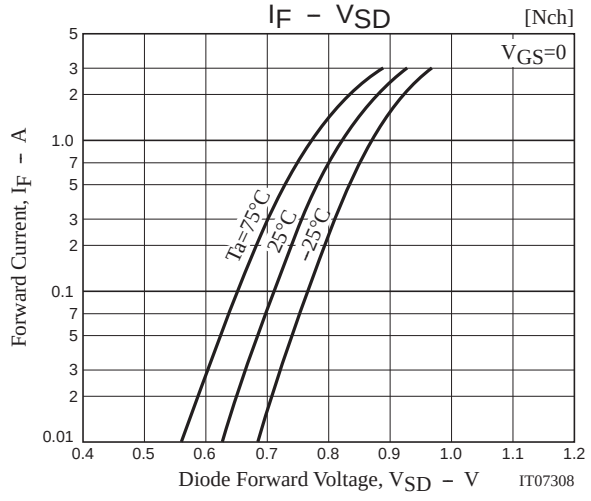

RDS(on) – VGS
[Pch]
Ta=25°C
–1.0A
ID= –0.5A
Static Drain-to-Source On-State Resistance, RDS(on) – mΩ
Gate-to-Source Voltage, VGS – V
IT07303

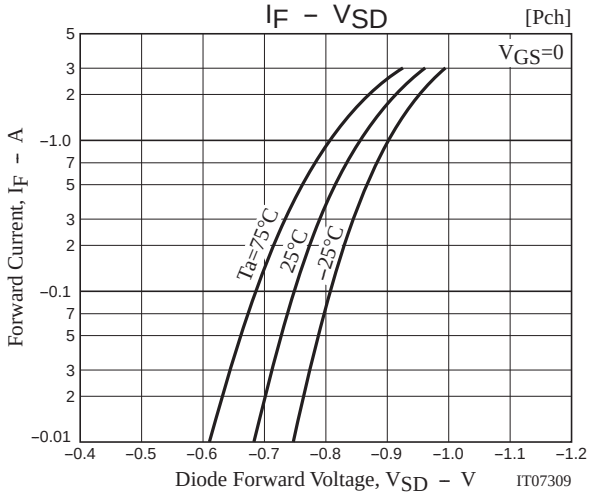

RDS(on) – Ta
[Nch]
ID=1.0A, VGS=4V
ID=1.5A, VGS=10V
Static Drain-to-Source On-State Resistance, RDS(on) – mΩ
Ambient Temperature, Ta – °C
IT07304

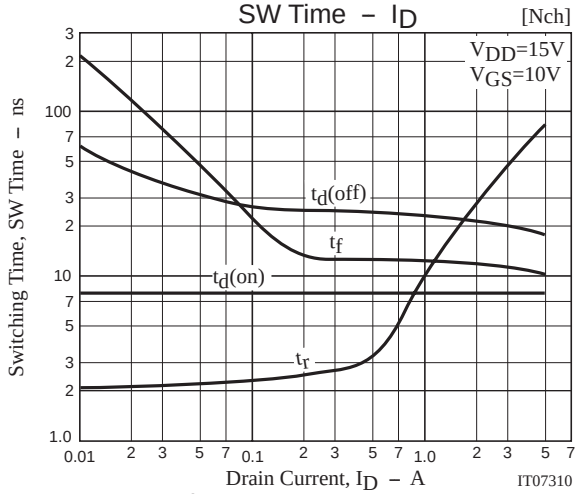

RDS(on) – Ta
[Pch]
ID= –0.5A, VGS= –4V
ID= –1.0A, VGS= –10V
Static Drain-to-Source On-State Resistance, RDS(on) – mΩ
Ambient Temperature, Ta – °C
IT07305

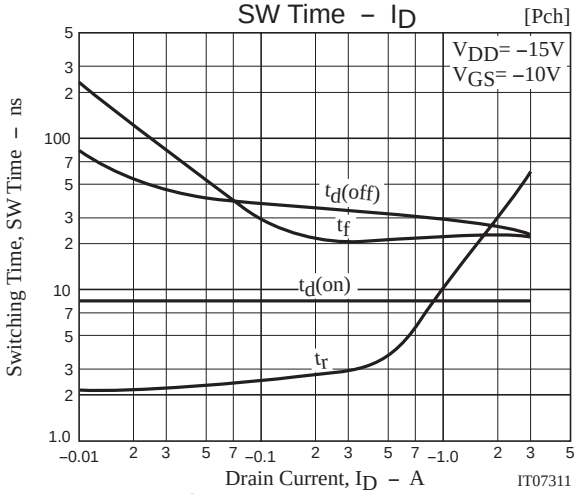

|yfs| – ID
[Nch]
VDS=10V
25°C
Ta= –25°C
75°C
Forward Transfer Admittance, |yfs| – S
Drain Current, ID – A
IT07306

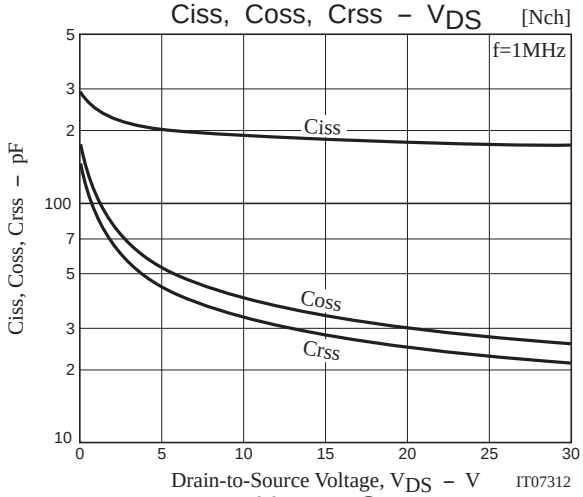

|yfs| – ID
[Pch]
VDS= –10V
25°C
Ta= –25°C
75°C
Forward Transfer Admittance, |yfs| – S
Drain Current, ID – A
IT07307

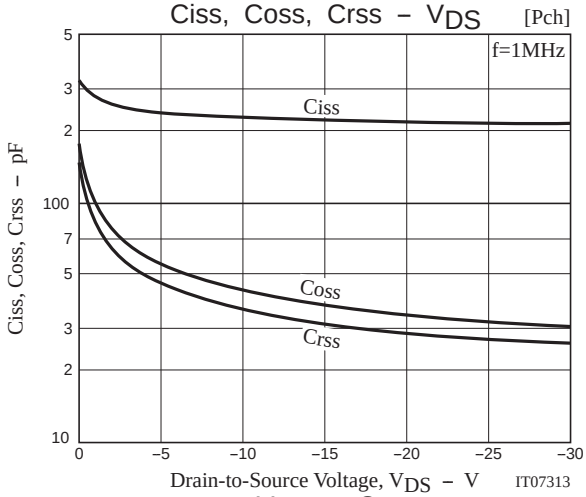

IF – VSD
[Nch]
VGS=0
Ta=75°C
25°C
–25°C
Forward Current, IF – A
Diode Forward Voltage, VSD – V
IT07308

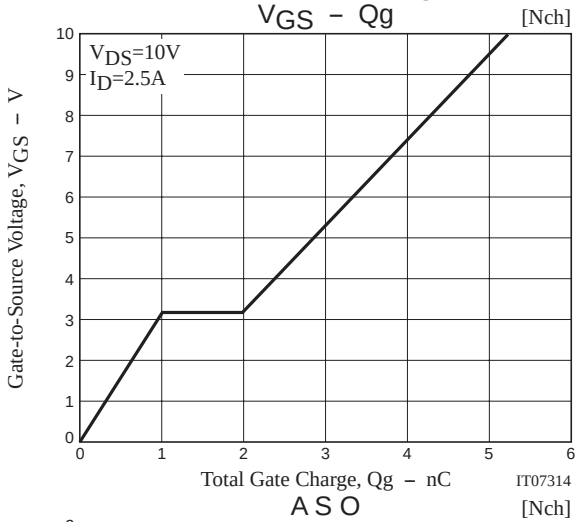

IF – VSD
[Pch]
VGS=0
Ta=75°C
25°C
–25°C
Forward Current, IF – A
Diode Forward Voltage, VSD – V
IT07309

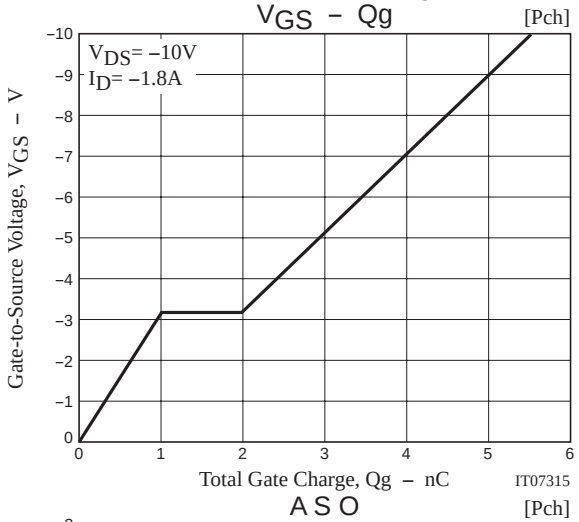

SW Time – ID
[Nch]
VDD=15V
VGS=10V
td(off)
tf
td(on)
tr
Switching Time, SW Time – ns
Drain Current, ID – A
IT07310

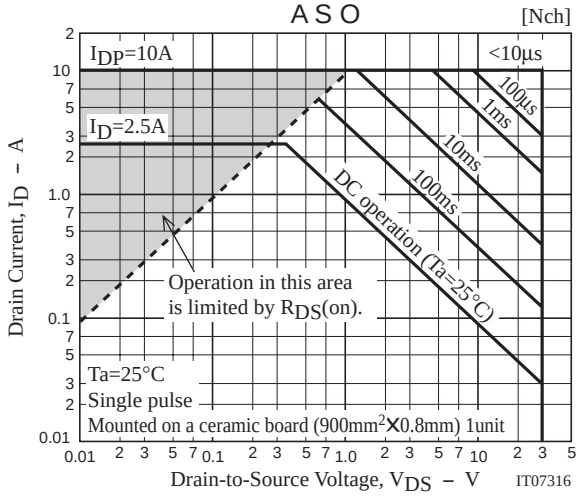

SW Time – ID
[Pch]
VDD= –15V
VGS= –10V
td(off)
tf
td(on)
tr
Switching Time, SW Time – ns
Drain Current, ID – A
IT07311

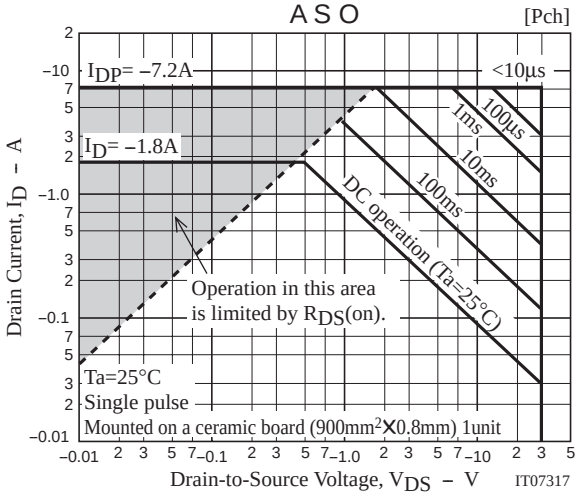

Ciss, Coss, Crss – VDS
[Nch]
f=1MHz
Ciss
Coss
Crss
Ciss, Coss, Crss – pF
Drain-to-Source Voltage, VDS – V
IT07312

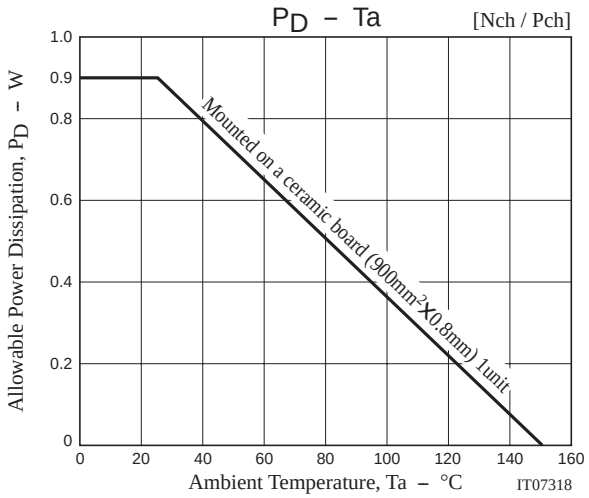

Ciss, Coss, Crss – VDS
[Pch]
f=1MHz
Ciss
Coss
Crss
Ciss, Coss, Crss – pF
Drain-to-Source Voltage, VDS – V
IT07313


VGS – Qg
[Nch]
VDS=10V
ID=2.5A
Gate-to-Source Voltage, VGS – V
Total Gate Charge, Qg – nC
IT07314


VGS – Qg
[Pch]
VDS= –10V
ID= –1.8A
Gate-to-Source Voltage, VGS – V
Total Gate Charge, Qg – nC
IT07315


A S O
[Nch]
IDP=10A
ID=2.5A
<10µs
100µs
1ms
10ms
100ms
DC operation (Ta=25°C)
Operation in this area
is limited by RDS(on).
Ta=25°C
Single pulse
Mounted on a ceramic board (900mm2×0.8mm) 1unit
Drain Current, ID – A
Drain-to-Source Voltage, VDS – V
IT07316


A S O
[Pch]
IDP= –7.2A
ID= –1.8A
<10µs
100µs
1ms
10ms
100ms
DC operation (Ta=25°C)
Operation in this area
is limited by RDS(on).
Ta=25°C
Single pulse
Mounted on a ceramic board (900mm2×0.8mm) 1unit
Drain Current, ID – A
Drain-to-Source Voltage, VDS – V
IT07317



Note on usage : Since the CPH6615 is a MOSFET product, please avoid using this device in the vicinity of highly charged objects.