



# CPH6610

— N-Channel and P-Channel Silicon MOSFETs

## Load Switching Applications

### Features

- The CPH6610 incorporates a P-channel MOSFET (MCH3335) and an N-channel MOSFET that feature low ON-resistance and ultrahigh-speed switching, thereby enabling high-density mounting.
- Excellent ON-resistance characteristic.

### Specifications

#### Absolute Maximum Ratings at Ta=25°C

Parameter	Symbol	Conditions	N-channel	P-channel	Unit
Drain-to-Source Voltage	V <sub>DSS</sub>		30	-30	V
Gate-to-Source Voltage (*1)	V <sub>GSS</sub>		±20	-9	V
Drain Current (DC)	I <sub>D</sub>		1.4	-0.4	A
Drain Current (Pulse)	I <sub>DP</sub>	PW≤10μs, duty cycle≤1%	5.6	-1.6	A
Allowable Power Dissipation	P <sub>D</sub>	Mounted on a ceramic board (900mm <sup>2</sup> ×0.8mm) 1unit	0.8		W
Channel Temperature	T <sub>ch</sub>		150		°C
Storage Temperature	T <sub>stg</sub>		-55 to +150		°C

(\*1) : When designing a circuit using this product, that this P-channel MOSFET has a gate (oxide film) protection diode connected only between its gate and source.

#### 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 <sub>D</sub> =1mA, V <sub>GS</sub> =0	30			V
Zero-Gate Voltage Drain Current	I <sub>DSS</sub>	V <sub>DS</sub> =30V, V <sub>GS</sub> =0			1	μA
Gate-to-Source Leakage Current	I <sub>GSS</sub>	V <sub>GS</sub> =±16V, V <sub>DS</sub> =0			±10	μA
Cutoff Voltage	V <sub>GS(off)</sub>	V <sub>DS</sub> =10V, I <sub>D</sub> =1mA	1.2		2.6	V
Forward Transfer Admittance	y <sub>fs</sub>	V <sub>DS</sub> =10V, I <sub>D</sub> =700mA	0.66	1.1		S
Static Drain-to-Source On-State Resistance	R <sub>DS(on)1</sub>	I <sub>D</sub> =700mA, V <sub>GS</sub> =10V		245	320	mΩ
	R <sub>DS(on)2</sub>	I <sub>D</sub> =400mA, V <sub>GS</sub> =4V		415	580	mΩ
Input Capacitance	C <sub>iss</sub>	V <sub>DS</sub> =10V, f=1MHz		65		pF
Output Capacitance	C <sub>oss</sub>	V <sub>DS</sub> =10V, f=1MHz		14		pF
Reverse Transfer Capacitance	C <sub>rss</sub>	V <sub>DS</sub> =10V, f=1MHz		8		pF

Marking : FQ

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# CPH6610

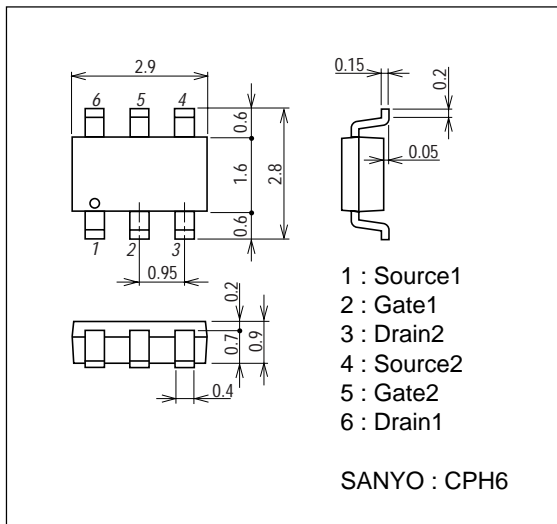
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Parameter	Symbol	Conditions	Ratings			Unit
			min	typ	max	
Turn-ON Delay Time	$t_{d(on)}$	See specified Test Circuit.		5		ns
Rise Time	$t_r$	See specified Test Circuit.		4		ns
Turn-OFF Delay Time	$t_{d(off)}$	See specified Test Circuit.		11		ns
Fall Time	$t_f$	See specified Test Circuit.		3		ns
Total Gate Charge	Qg	$V_{DS}=10V, V_{GS}=10V, I_D=1.4A$		2.5		nC
Gate-to-Source Charge	Qgs	$V_{DS}=10V, V_{GS}=10V, I_D=1.4A$		0.6		nC
Gate-to-Drain "Miller" Charge	Qgd	$V_{DS}=10V, V_{GS}=10V, I_D=1.4A$		0.3		nC
Diode Forward Voltage	VSD	$I_S=1.4A, V_{GS}=0$		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	$\mu A$
Gate-to-Source Leakage Current	$I_{GSS}$	$V_{GS}=\pm 8V, V_{DS}=0$			$\pm 1$	$\mu A$
Cutoff Voltage	$V_{GS(off)}$	$V_{DS}=-10V, I_D=-100\mu A$	-0.4		-1.4	V
Forward Transfer Admittance	$ y_{fs} $	$V_{DS}=-10V, I_D=-200mA$	0.2	0.42		S
Static Drain-to-Source On-State Resistance	$R_{DS(on)1}$	$I_D=-200mA, V_{GS}=-4.5V$		1.4	1.8	$\Omega$
	$R_{DS(on)2}$	$I_D=-100mA, V_{GS}=-2.5V$		2.0	2.8	$\Omega$
Input Capacitance	Ciss	$V_{DS}=-10V, f=1MHz$		40		pF
Output Capacitance	Coss	$V_{DS}=-10V, f=1MHz$		8		pF
Reverse Transfer Capacitance	Crss	$V_{DS}=-10V, f=1MHz$		4.5		pF
Turn-ON Delay Time	$t_{d(on)}$	See specified Test Circuit.		10		ns
Rise Time	$t_r$	See specified Test Circuit.		5		ns
Turn-OFF Delay Time	$t_{d(off)}$	See specified Test Circuit.		10		ns
Fall Time	$t_f$	See specified Test Circuit.		5		ns
Total Gate Charge	Qg	$V_{DS}=-10V, V_{GS}=-4.5V, I_D=-400mA$		0.83		nC
Gate-to-Source Charge	Qgs	$V_{DS}=-10V, V_{GS}=-4.5V, I_D=-400mA$		0.25		nC
Gate-to-Drain "Miller" Charge	Qgd	$V_{DS}=-10V, V_{GS}=-4.5V, I_D=-400mA$		0.17		nC
Diode Forward Voltage	VSD	$I_S=-400mA, V_{GS}=0$		-1.0	-1.5	V

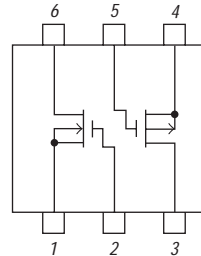
## Package Dimensions

unit : mm

2202



## Electrical Connection

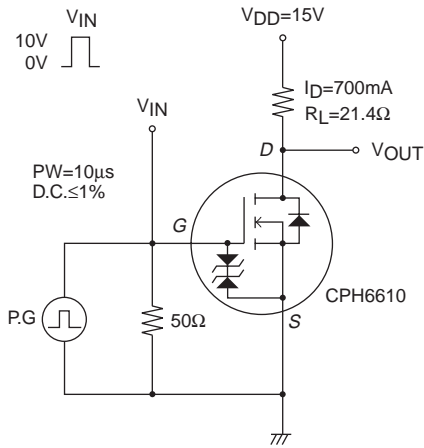


- 1 : Source1
- 2 : Gate1
- 3 : Drain2
- 4 : Source2
- 5 : Gate2
- 6 : Drain1

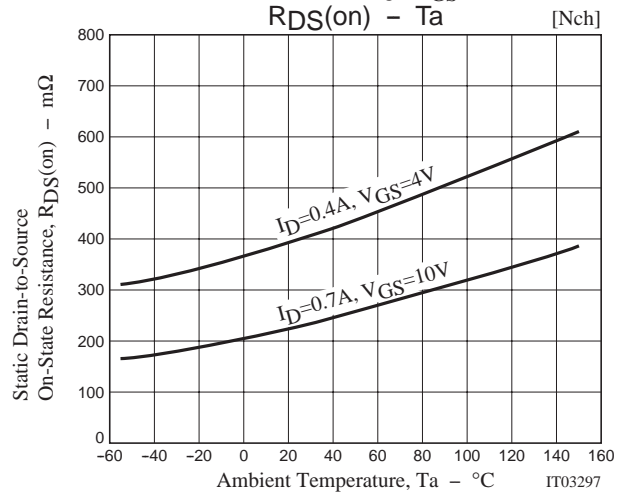
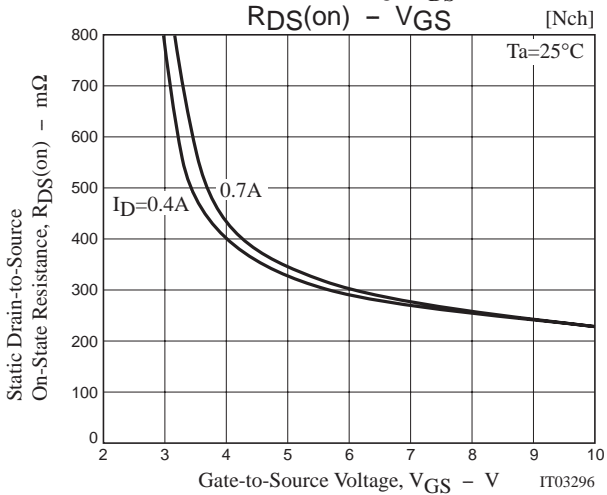
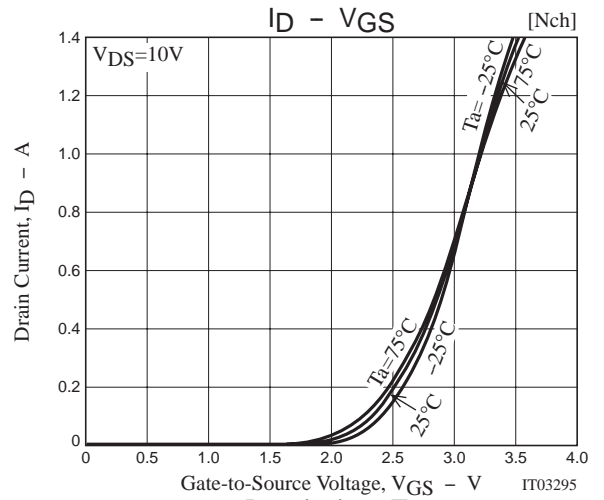
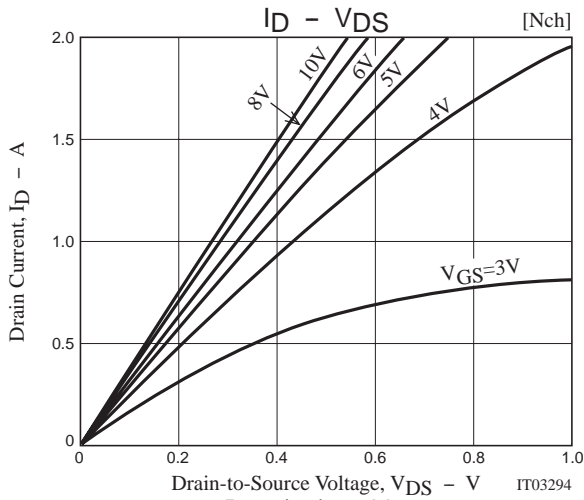
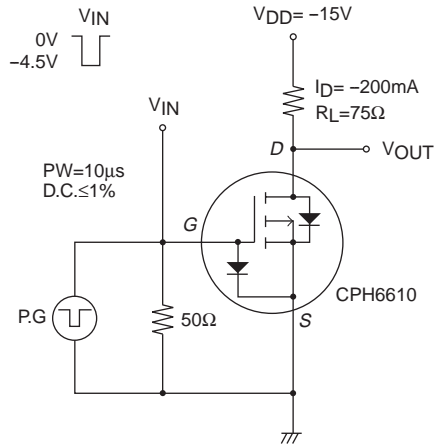
Top view

Switching Time Test Circuit

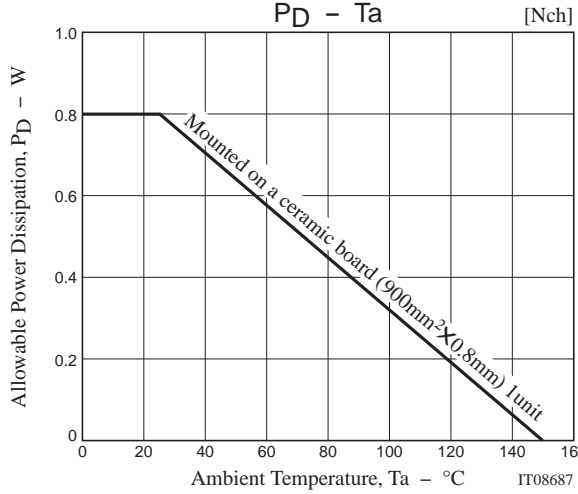
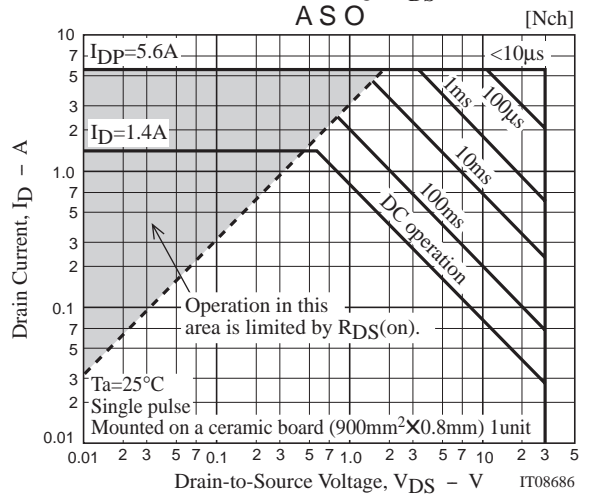
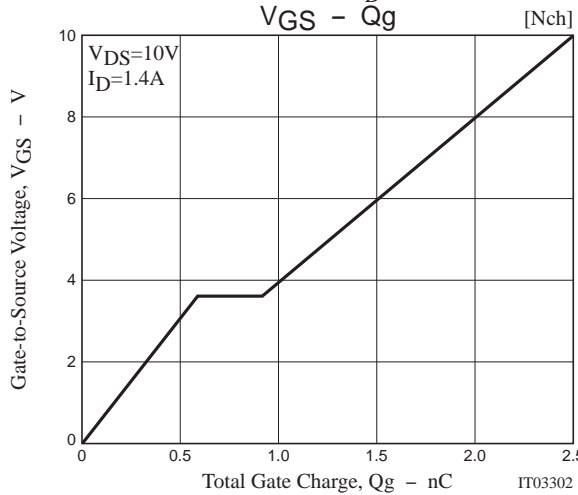
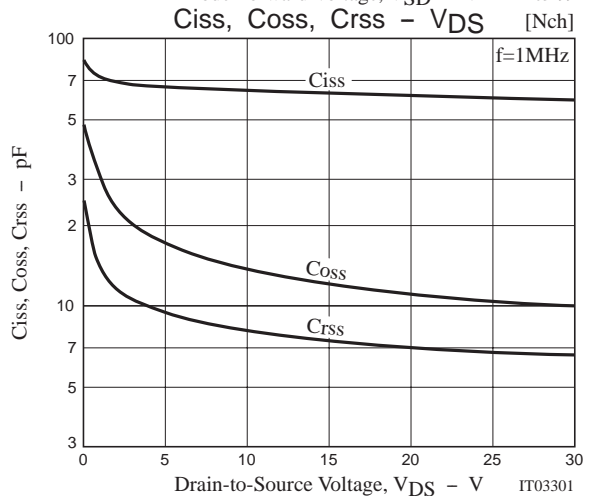
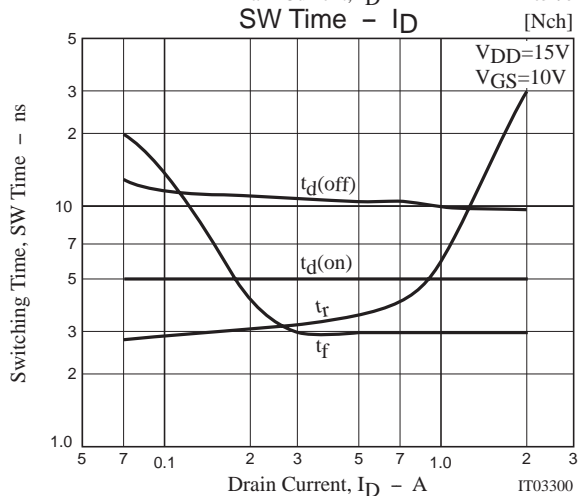
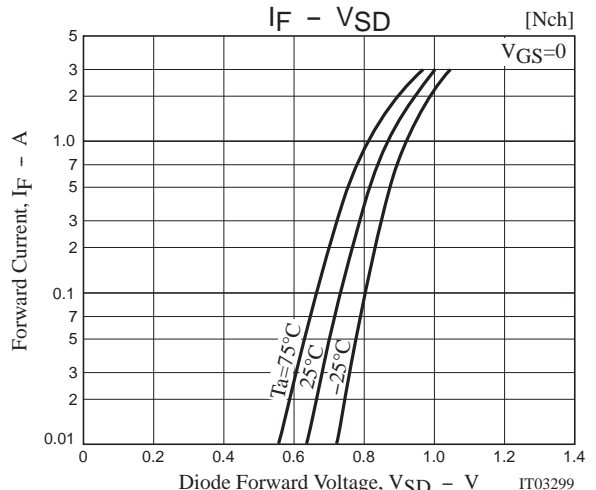
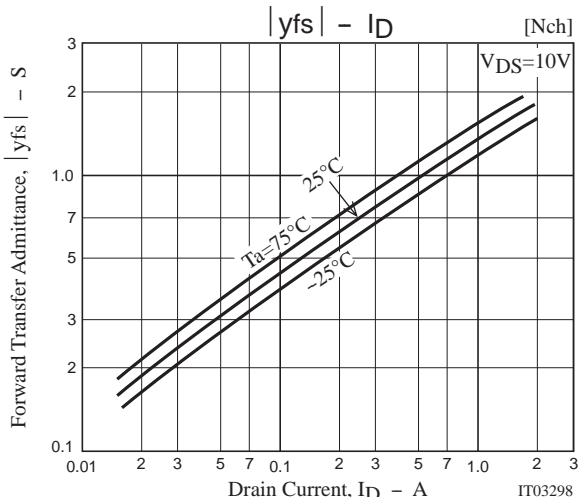
[N-channel]



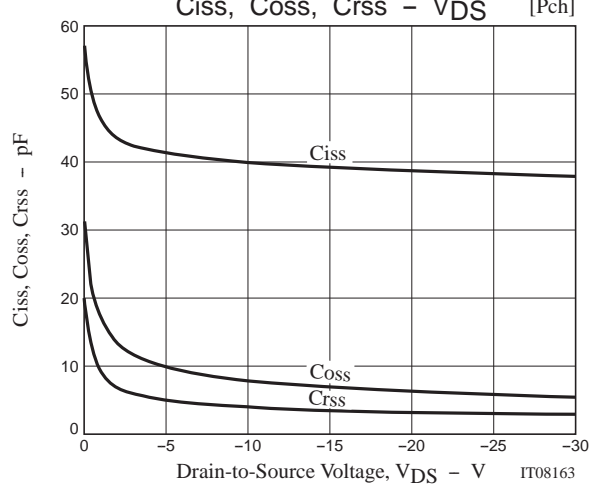
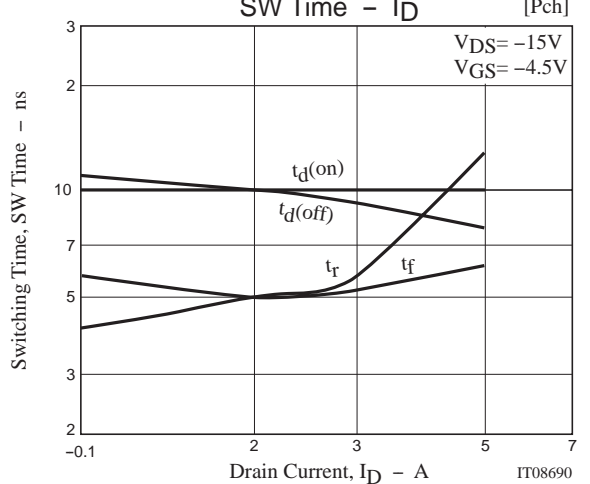
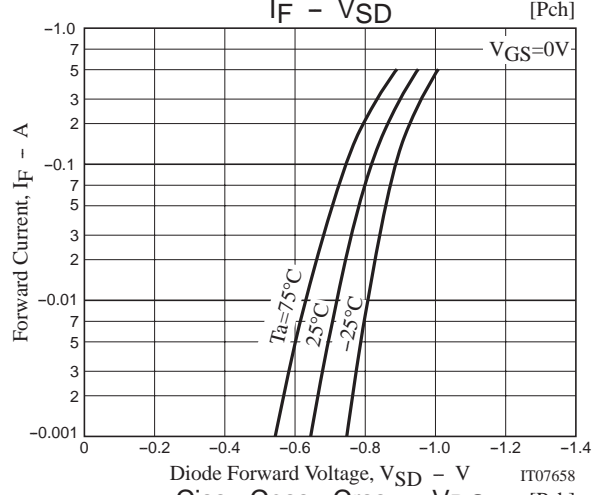
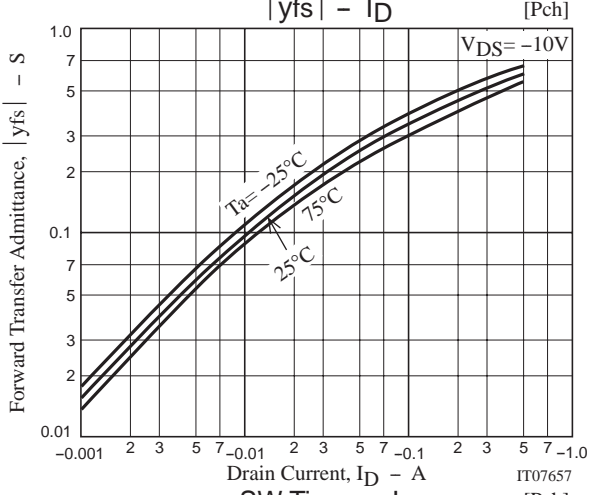
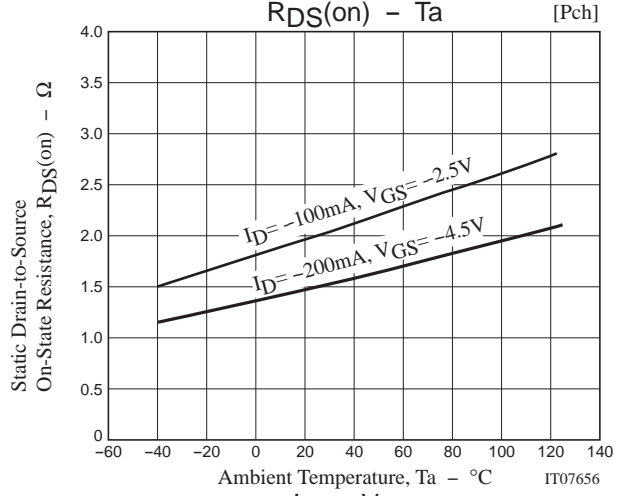
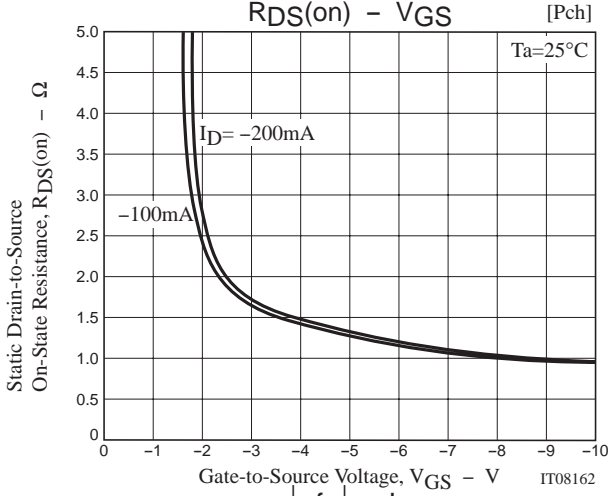
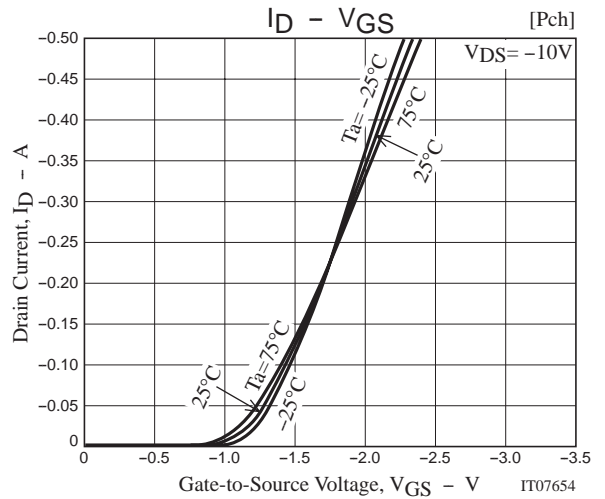
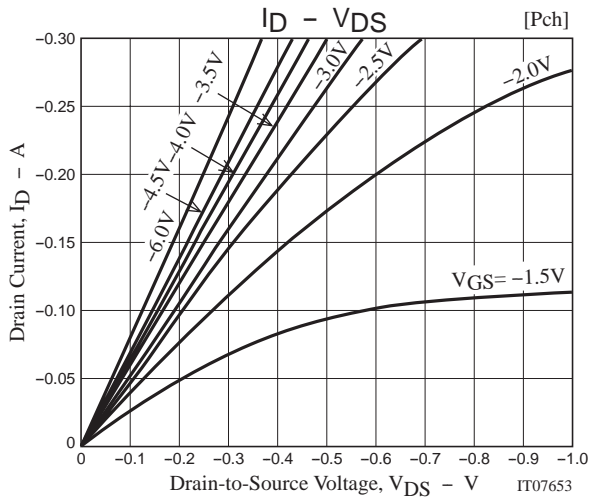
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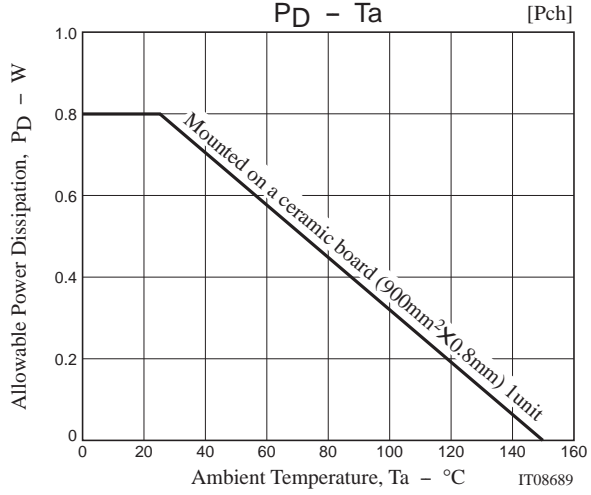
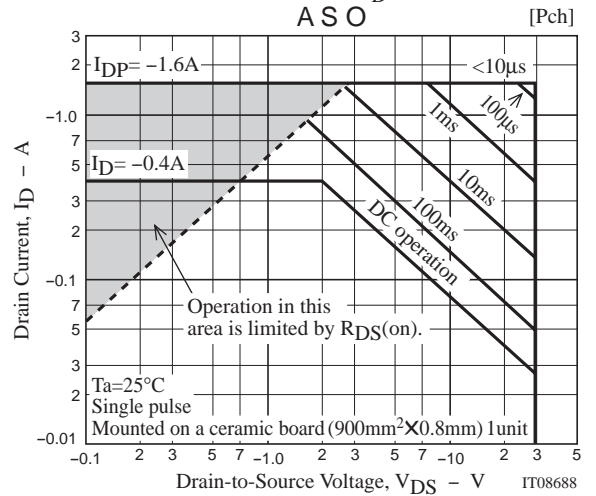
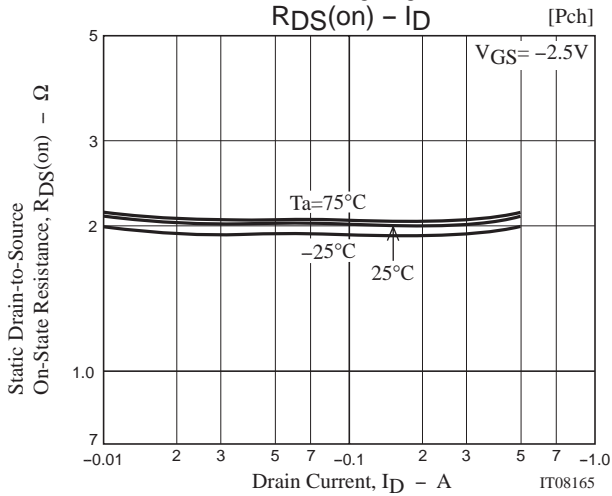
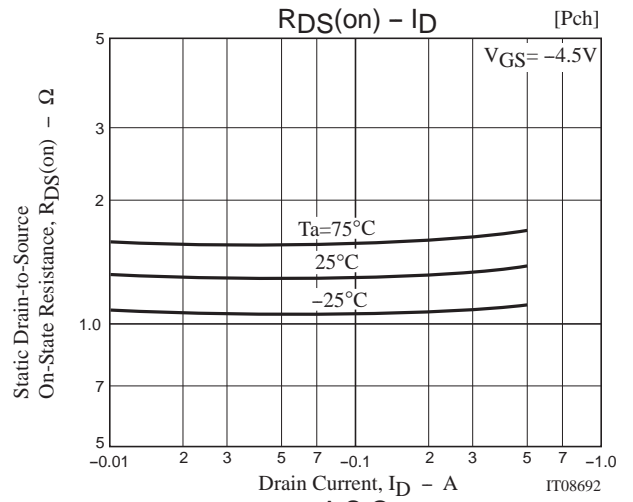
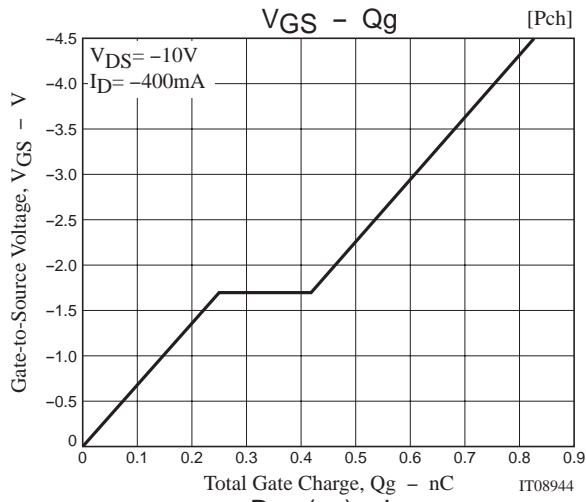
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Note on usage : Since the CPH6610 is a MOSFET product, please avoid using this device in the vicinity of highly charged objects.

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