

**CPH5605**

## Ultrahigh-Speed Switching Applications

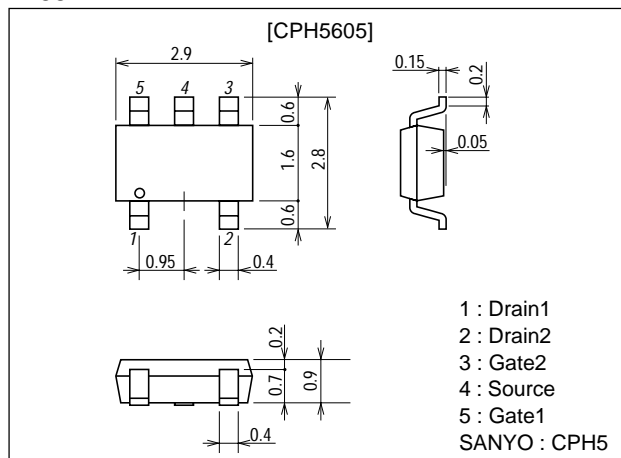
### Features

- The CPH5605 incorporates an N-channel MOSFET and a P-channel MOSFET that feature low ON resistance and high-speed switching, thereby enabling high-density mounting.
- 2.5V drive.

### Package Dimensions

unit:mm

2168



### Specifications

Absolute Maximum Ratings at  $T_a = 25^\circ\text{C}$ 

Parameter	Symbol	Conditions	Ratings		Unit
			N-channel	P-channel	
Drain-to-Source Voltage	$V_{DSS}$		20	-20	V
Gate-to-Source Voltage	$V_{GSS}$		$\pm 10$	$\pm 10$	V
Drain Current (DC)	$I_D$		1.4	-1	A
Drain Current (pulse)	$I_{DP}$	$PW \leq 10\mu\text{s}$ , duty cycle $\leq 1\%$	5.6	-4	A
Allowable Power Dissipation	$P_D$	Mounted on a ceramic board (600mm $\times$ 0.8mm) 1unit	0.9		W
Channel Temperature	$T_{ch}$		150		$^\circ\text{C}$
Storage Temperature	$T_{stg}$		-55 to +150		$^\circ\text{C}$

Electrical Characteristics at  $T_a = 25^\circ\text{C}$ 

Parameter	Symbol	Conditions	Ratings			Unit
			min	typ	max	
[N-channel]						
Drain-to-Source Breakdown Voltage	$V_{(BR)DSS}$	$I_D=1mA, V_{GS}=0$	20			V
Zero-Gate Voltage Drain Current	$I_{DSS}$	$V_{DS}=20V, V_{GS}=0$			10	$\mu A$
Gate-to-Source Leakage Current	$I_{GSS}$	$V_{GS}=\pm 8V, V_{DS}=0$			$\pm 10$	$\mu A$
Cutoff Voltage	$V_{GS(off)}$	$V_{DS}=10V, I_D=1mA$	0.4		1.3	V
Forward Transfer Admittance	$ y_{fs} $	$V_{DS}=10V, I_D=700mA$	1.8	2.5		S
Static Drain-to-Source On-State Resistance	$R_{DS(on)1}$	$I_D=700mA, V_{GS}=4V$		200	260	$m\Omega$
	$R_{DS(on)2}$	$I_D=400mA, V_{GS}=2.5V$		260	360	$m\Omega$

Marking : FE

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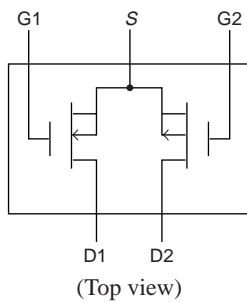
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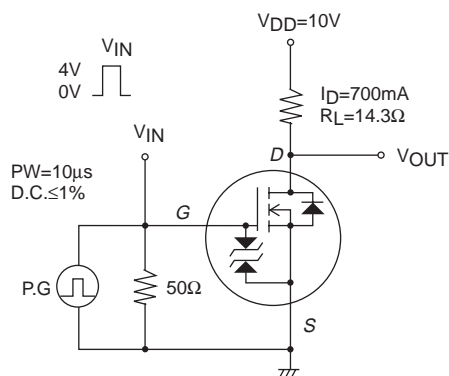
Parameter	Symbol	Conditions	Ratings			Unit
			min	typ	max	
Input Capacitance	$C_{iss}$	$V_{DS}=10V, f=1MHz$		90		pF
Output Capacitance	$C_{oss}$	$V_{DS}=10V, f=1MHz$		60		pF
Reverse Transfer Capacitance	$C_{rss}$	$V_{DS}=10V, f=1MHz$		28		pF
Turn-ON Delay Time	$t_{d(on)}$	See specified Test Circuit		10		ns
Rise Time	$t_r$	See specified Test Circuit		20		ns
Turn-OFF Delay Time	$t_{d(off)}$	See specified Test Circuit		20		ns
Fall Time	$t_f$	See specified Test Circuit		20		ns
Total Gate Charge	$Q_g$	$V_{DS}=10V, V_{GS}=10V, I_D=1.4A$		6		nC
Gate-to-Source Charge	$Q_{gs}$	$V_{DS}=10V, V_{GS}=10V, I_D=1.4A$		1		nC
Gate-to-Drain "Miller" Charge	$Q_{gd}$	$V_{DS}=10V, V_{GS}=10V, I_D=1.4A$		2		nC
Diode Forward Voltage	$V_{SD}$	$I_S=1.4A, V_{GS}=0$		0.9	1.2	V
[P-channel]						
Drain-to-Source Breakdown Voltage	$V_{(BR)DSS}$	$I_D=-1mA, V_{GS}=0$	-20			V
Zero-Gate Voltage Drain Current	$I_{DSS}$	$V_{DS}=-20V, V_{GS}=0$			-10	$\mu A$
Gate-to-Source Leakage Current	$I_{GSS}$	$V_{GS}=\pm 8V, V_{DS}=0$			$\pm 10$	$\mu A$
Cutoff Voltage	$V_{GS(off)}$	$V_{DS}=-10V, I_D=-1mA$	-0.4		-1.4	V
Forward Transfer Admittance	$ y_{fs} $	$V_{DS}=-10V, I_D=-500mA$	1.0	1.4		S
Static Drain-to-Source On-State Resistance	$R_{DS(on)1}$	$I_D=-500mA, V_{GS}=-4V$		420	550	$m\Omega$
	$R_{DS(on)2}$	$I_D=-300mA, V_{GS}=-2.5V$		630	890	$m\Omega$
Input Capacitance	$C_{iss}$	$V_{DS}=-10V, f=1MHz$		100		pF
Output Capacitance	$C_{oss}$	$V_{DS}=-10V, f=1MHz$		60		pF
Reverse Transfer Capacitance	$C_{rss}$	$V_{DS}=-10V, f=1MHz$		25		pF
Turn-ON Delay Time	$t_{d(on)}$	See specified Test Circuit		10		ns
Rise Time	$t_r$	See specified Test Circuit		25		ns
Turn-OFF Delay Time	$t_{d(off)}$	See specified Test Circuit		27		ns
Fall Time	$t_f$	See specified Test Circuit		32		ns
Total Gate Charge	$Q_g$	$V_{DS}=-10V, V_{GS}=-10V, I_D=-1.0A$		5		nC
Gate-to-Source Charge	$Q_{gs}$	$V_{DS}=-10V, V_{GS}=-10V, I_D=-1.0A$		1		nC
Gate-to-Drain "Miller" Charge	$Q_{gd}$	$V_{DS}=-10V, V_{GS}=-10V, I_D=-1.0A$		1		nC
Diode Forward Voltage	$V_{SD}$	$I_S=-1.0A, V_{GS}=0$		-0.9	-1.5	V

## Electrical Connection



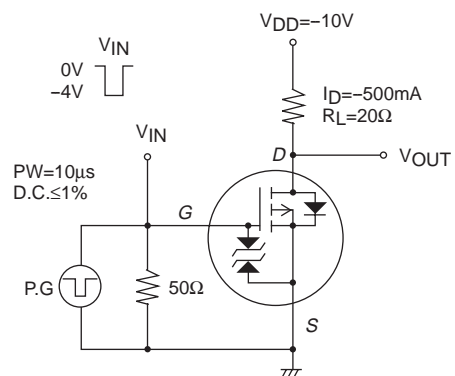
## Switching Time Test Circuit

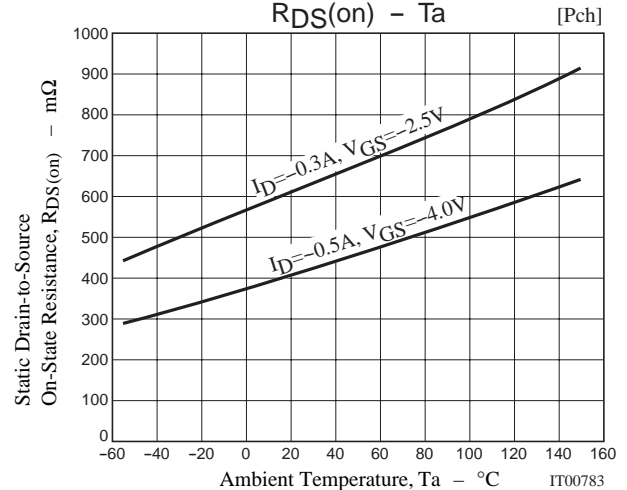
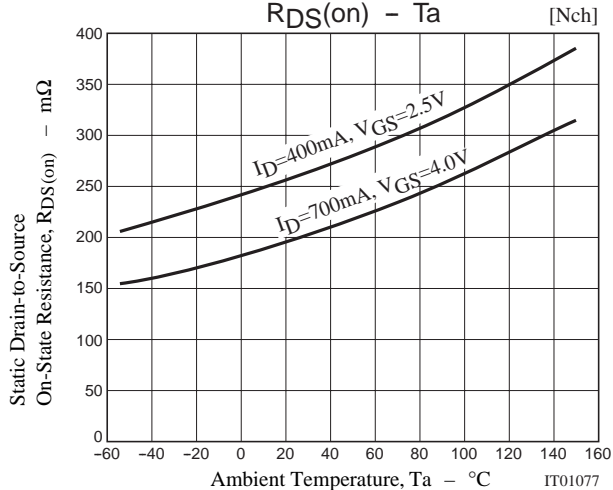
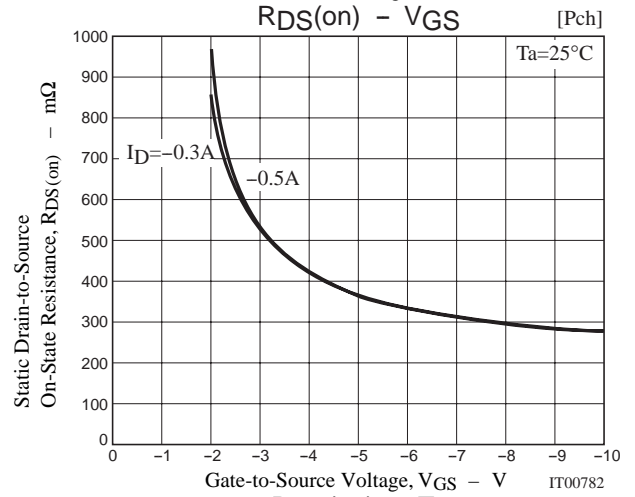
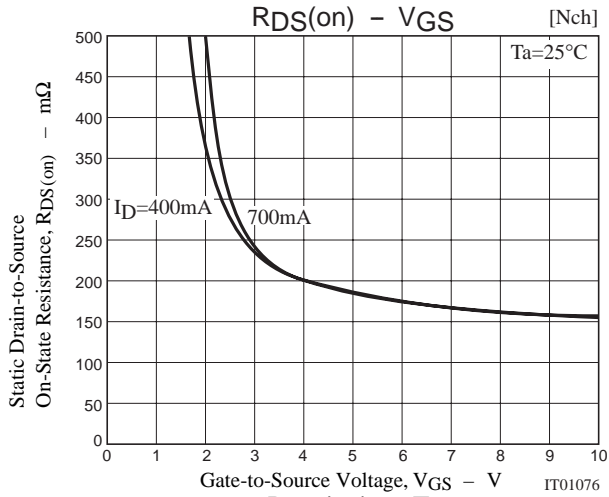
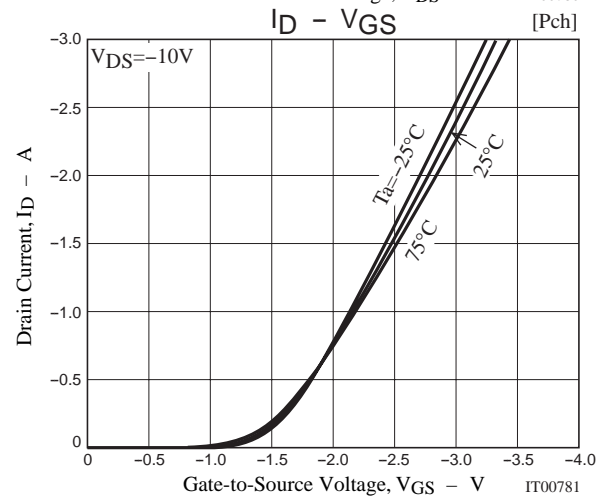
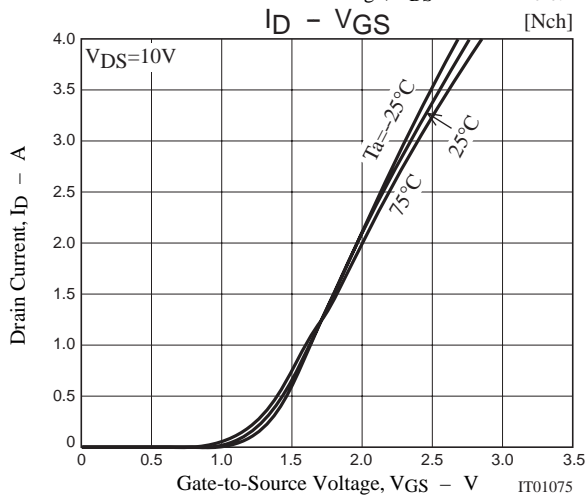
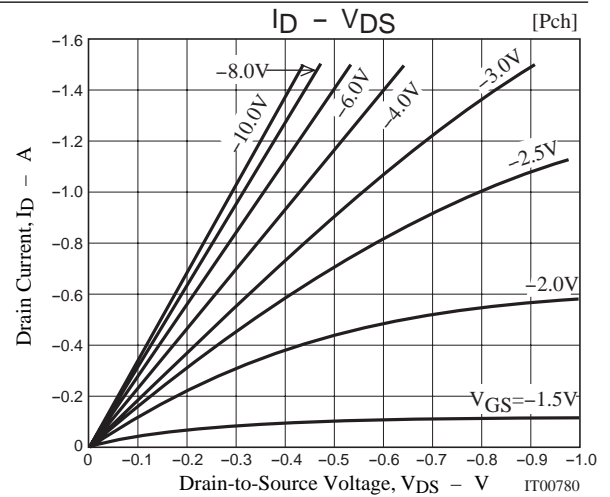
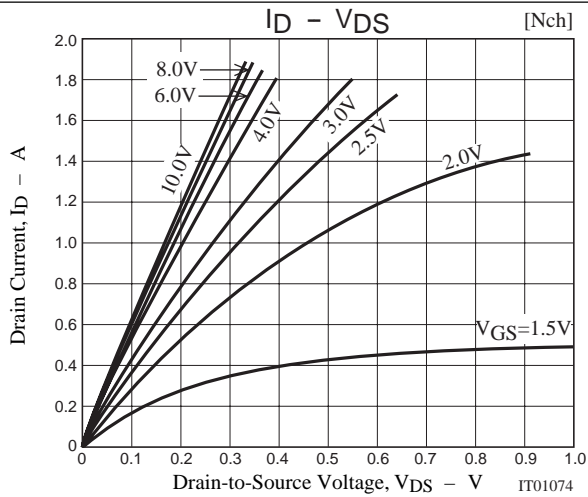
[N-channel]



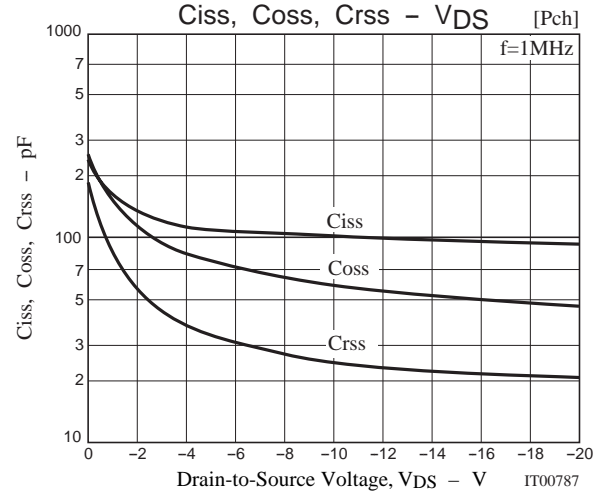
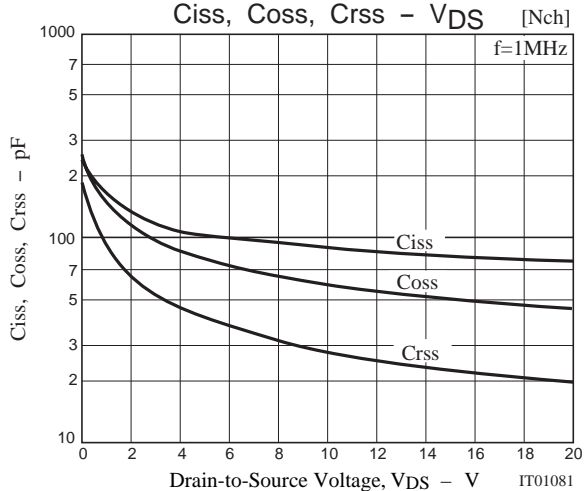
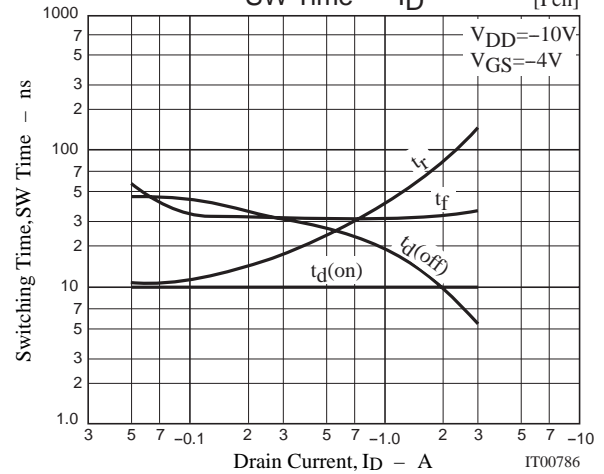
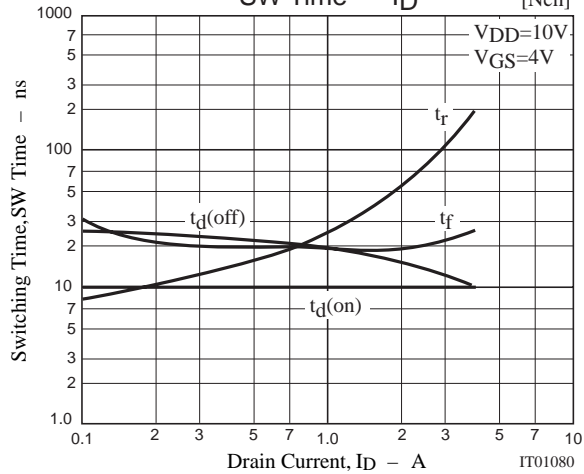
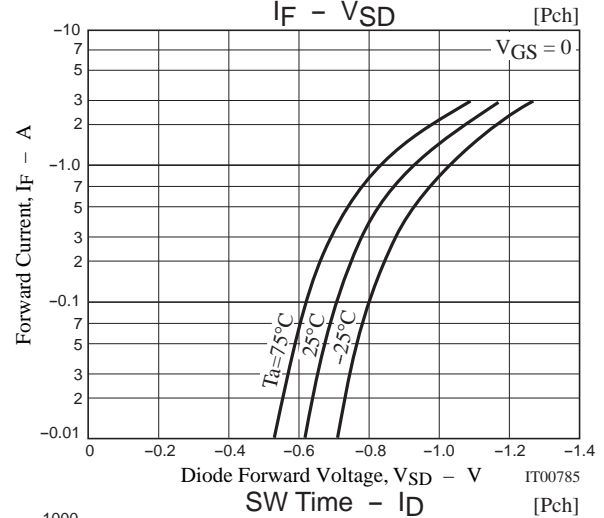
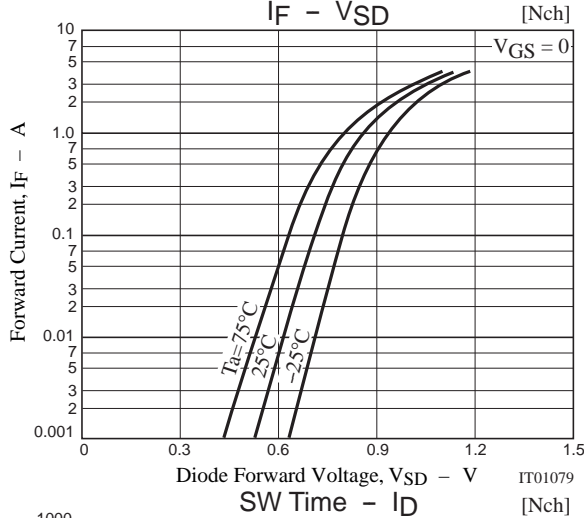
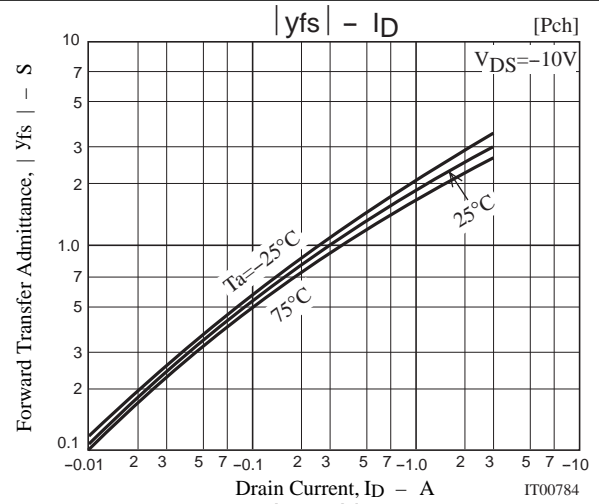
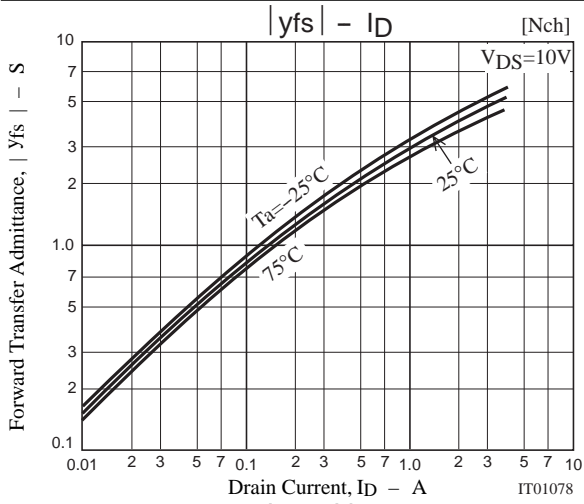
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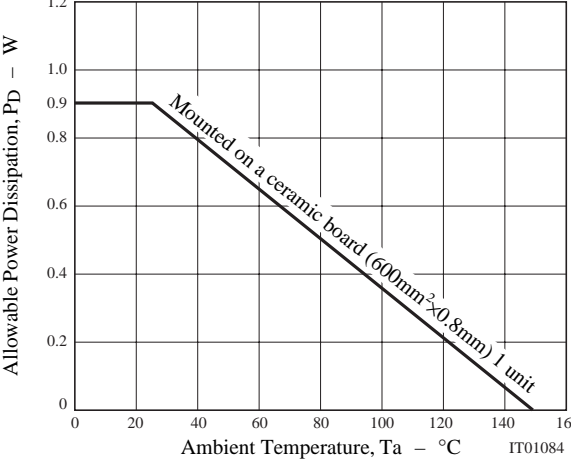
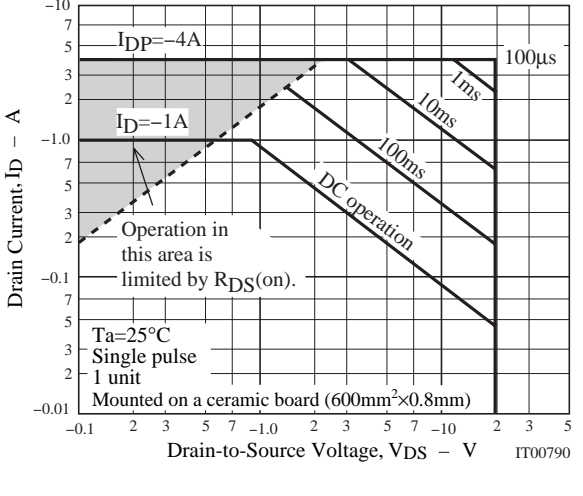
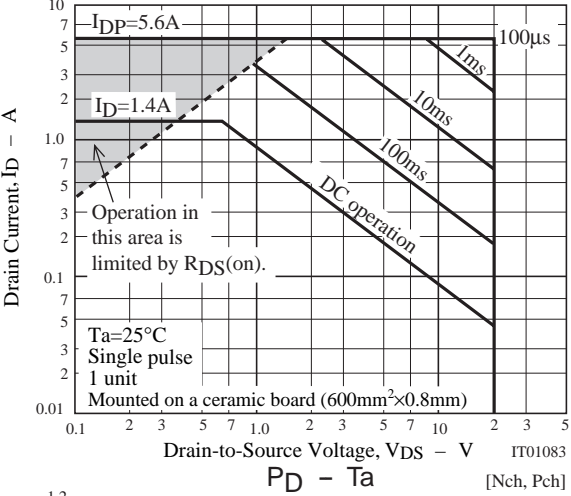
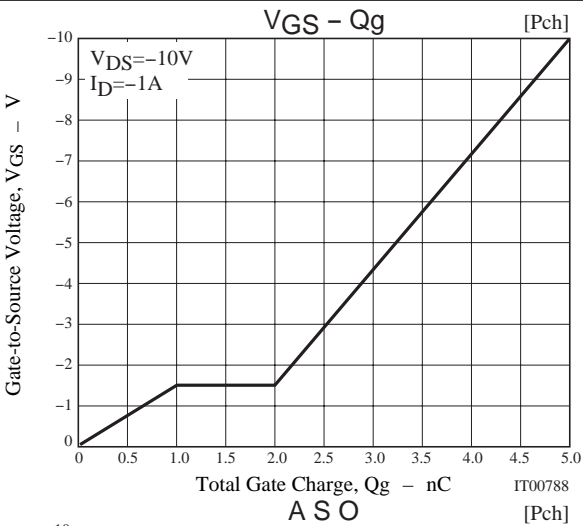
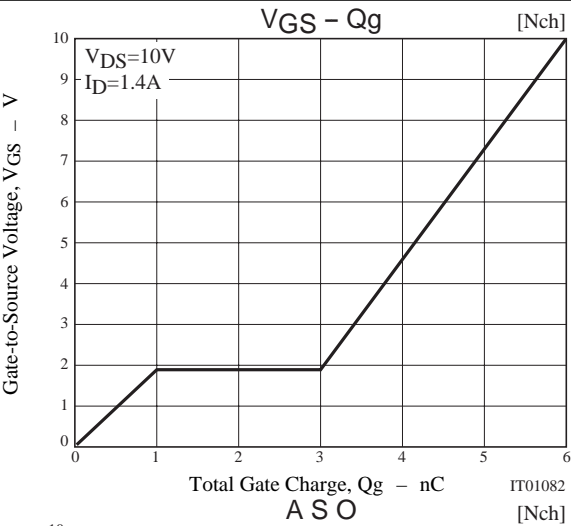
[P-channel]





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