



CPH5605

Ultrahigh-Speed Switching Applications

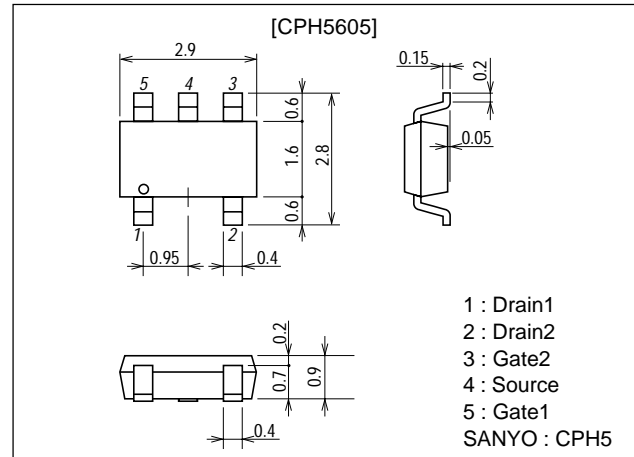
Features

- 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}		± 10	± 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	$V_{(BR)DSS}$	$I_D=1\text{mA}$, $V_{GS}=0$	20			V
Zero-Gate Voltage Drain Current	I_{DSS}	$V_{DS}=20\text{V}$, $V_{GS}=0$			10	μA
Gate-to-Source Leakage Current	I_{GSS}	$V_{GS}=\pm 8\text{V}$, $V_{DS}=0$			± 10	μA
Cutoff Voltage	$V_{GS(off)}$	$V_{DS}=10\text{V}$, $I_D=1\text{mA}$	0.4		1.3	V
Forward Transfer Admittance	$ y_{fs} $	$V_{DS}=10\text{V}$, $I_D=700\text{mA}$	1.8	2.5		S
Static Drain-to-Source On-State Resistance	$R_{DS(on)1}$	$I_D=700\text{mA}$, $V_{GS}=4\text{V}$		200	260	$\text{m}\Omega$
	$R_{DS(on)2}$	$I_D=400\text{mA}$, $V_{GS}=2.5\text{V}$		260	360	$\text{m}\Omega$

Marking : FE

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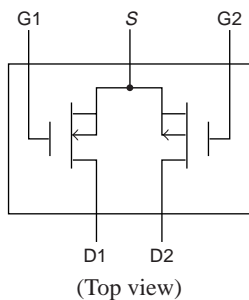
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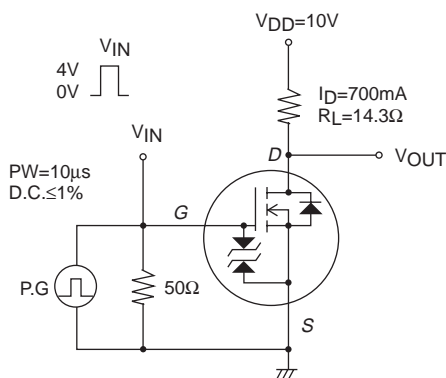
Parameter	Symbol	Conditions	Ratings			Unit
			min	typ	max	
Input Capacitance	Ciss	$V_{DS}=10V, f=1MHz$		90		pF
Output Capacitance	Coss	$V_{DS}=10V, f=1MHz$		60		pF
Reverse Transfer Capacitance	Crss	$V_{DS}=10V, f=1MHz$		28		pF
Turn-ON Delay Time	$t_{d(on)}$	See specified Test Circuit		10		ns
Rise Time	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	Qg	$V_{DS}=10V, V_{GS}=10V, I_D=1.4A$		6		nC
Gate-to-Source Charge	Qgs	$V_{DS}=10V, V_{GS}=10V, I_D=1.4A$		1		nC
Gate-to-Drain "Miller" Charge	Qgd	$V_{DS}=10V, V_{GS}=10V, I_D=1.4A$		2		nC
Diode Forward Voltage	VSD	$I_S=1.4A, V_{GS}=0$		0.9	1.2	V
[P-channel]						
Drain-to-Source Breakdown Voltage	$V_{(BR)DSS}$	$I_D=-1mA, V_{GS}=0$	-20			V
Zero-Gate Voltage Drain Current	I_{DSS}	$V_{DS}=-20V, V_{GS}=0$			-10	μA
Gate-to-Source Leakage Current	I_{GSS}	$V_{GS}=\pm 8V, V_{DS}=0$			± 10	μA
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 Ω
	$R_{DS(on)2}$	$I_D=-300mA, V_{GS}=-2.5V$		630	890	m Ω
Input Capacitance	Ciss	$V_{DS}=-10V, f=1MHz$		100		pF
Output Capacitance	Coss	$V_{DS}=-10V, f=1MHz$		60		pF
Reverse Transfer Capacitance	Crss	$V_{DS}=-10V, f=1MHz$		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	Qg	$V_{DS}=-10V, V_{GS}=-10V, I_D=-1.0A$		5		nC
Gate-to-Source Charge	Qgs	$V_{DS}=-10V, V_{GS}=-10V, I_D=-1.0A$		1		nC
Gate-to-Drain "Miller" Charge	Qgd	$V_{DS}=-10V, V_{GS}=-10V, I_D=-1.0A$		1		nC
Diode Forward Voltage	VSD	$I_S=-1.0A, V_{GS}=0$		-0.9	-1.5	V

Electrical Connection



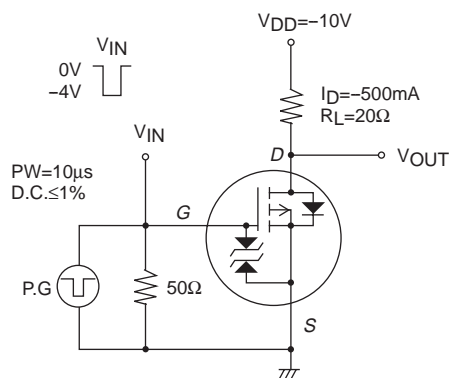
Switching Time Test Circuit

[N-channel]

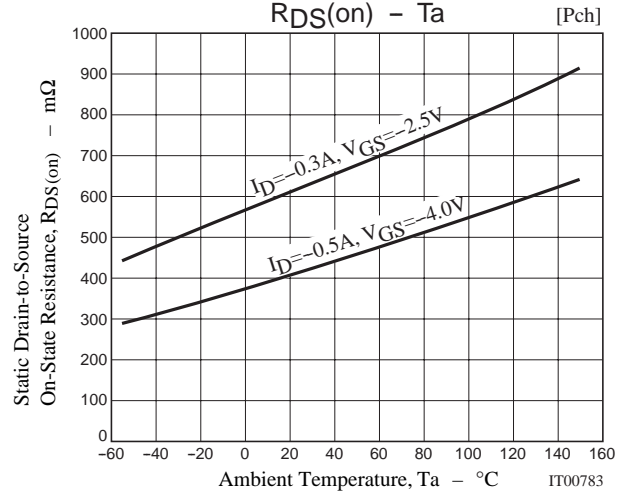
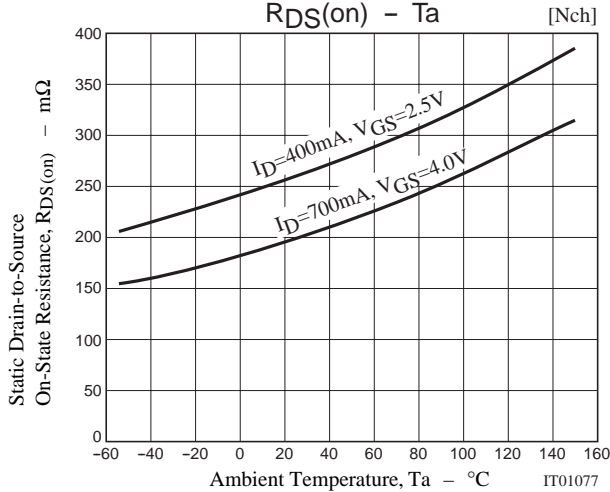
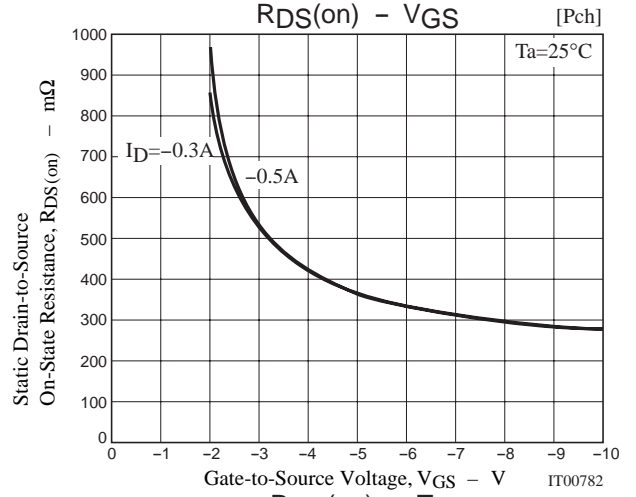
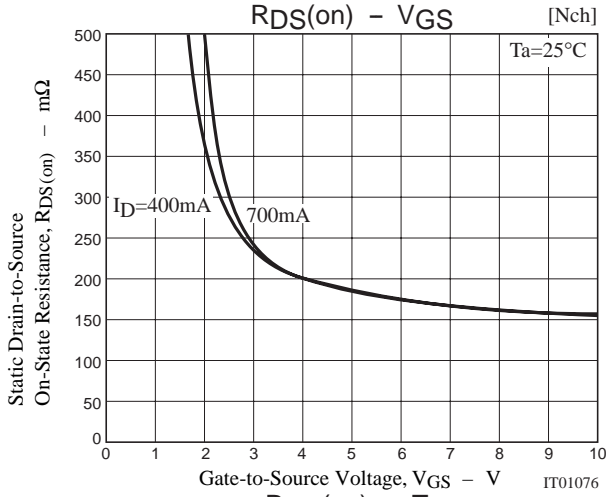
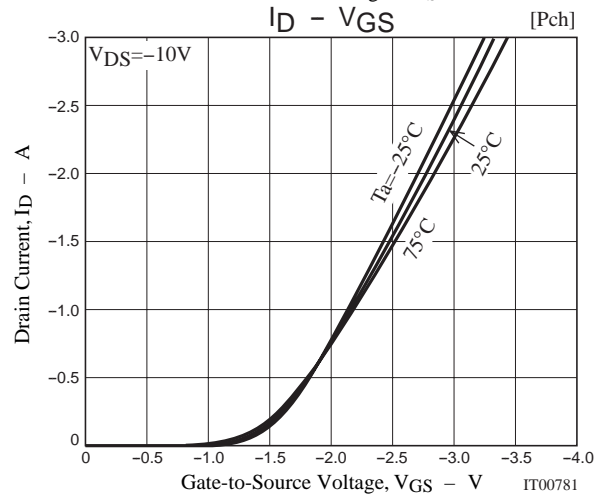
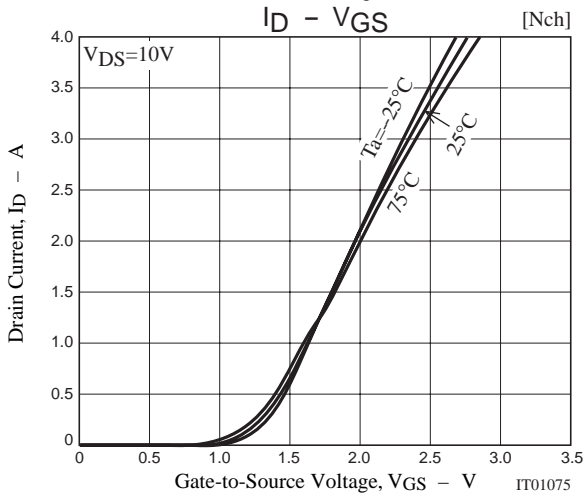
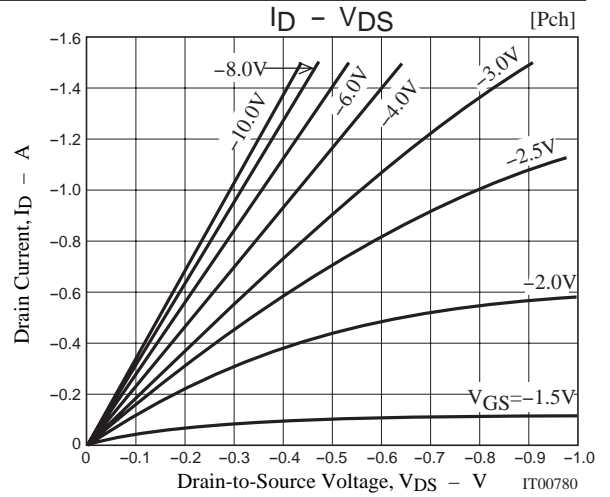
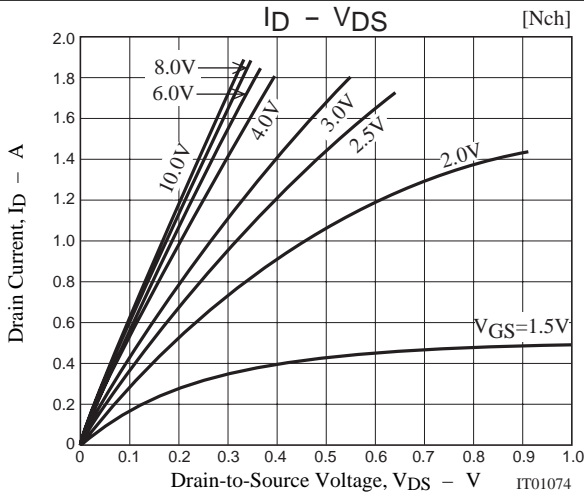


Switching Time Test Circuit

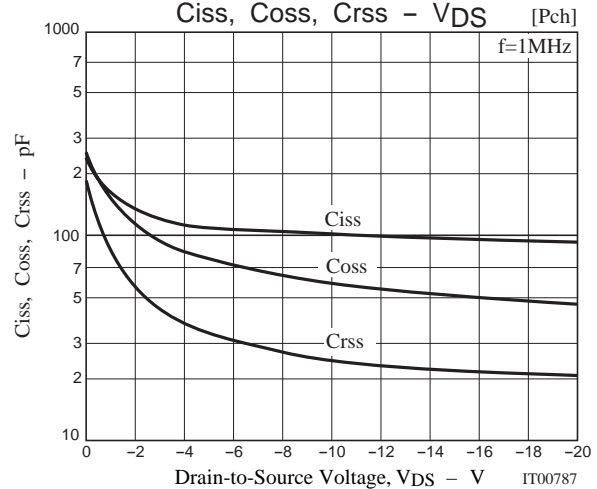
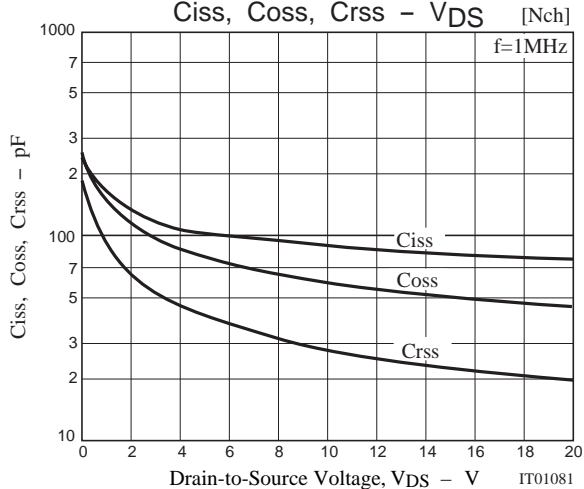
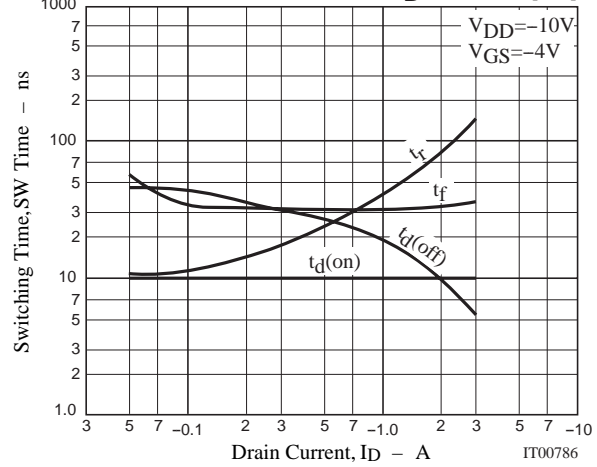
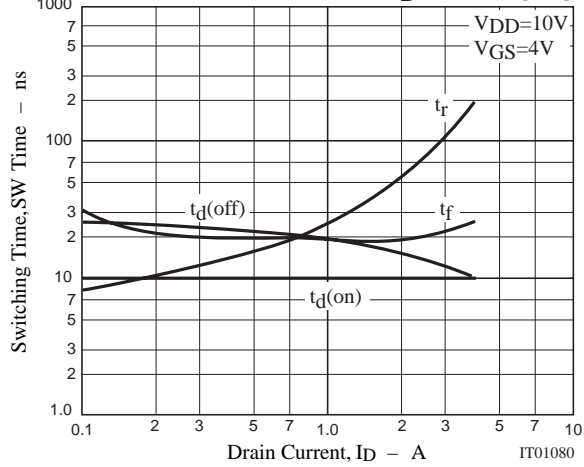
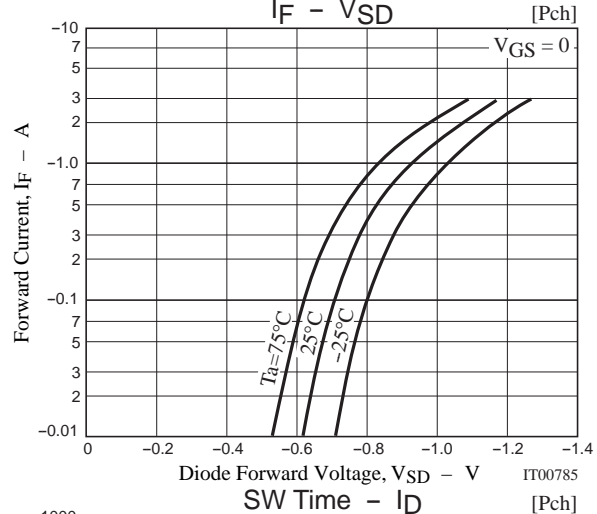
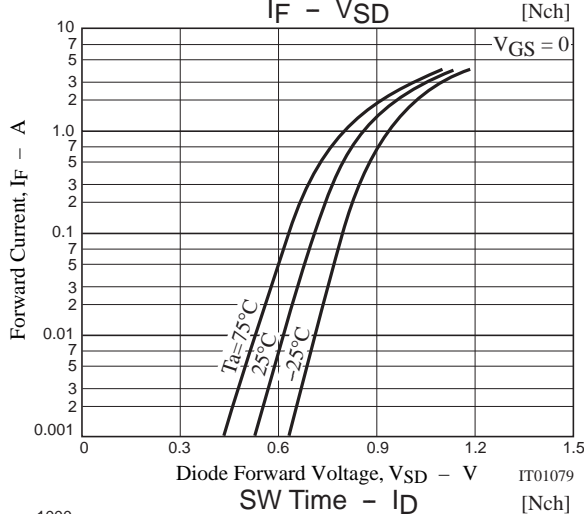
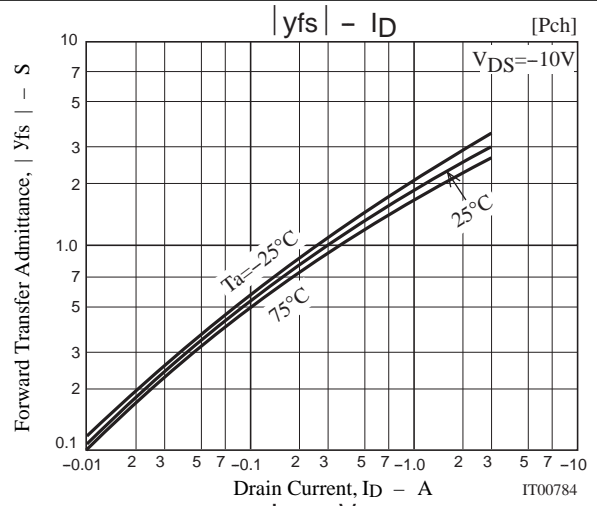
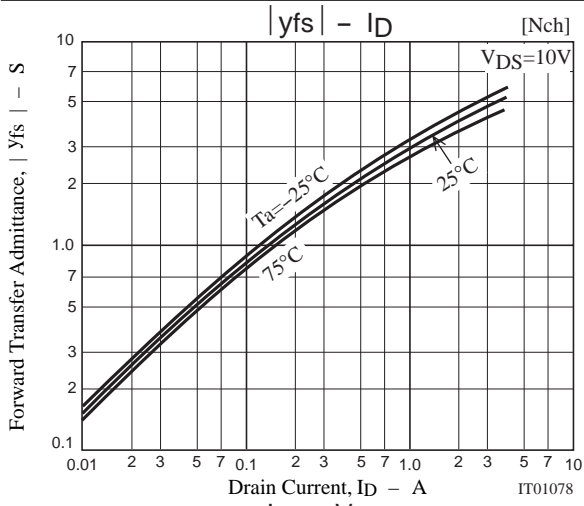
[P-channel]



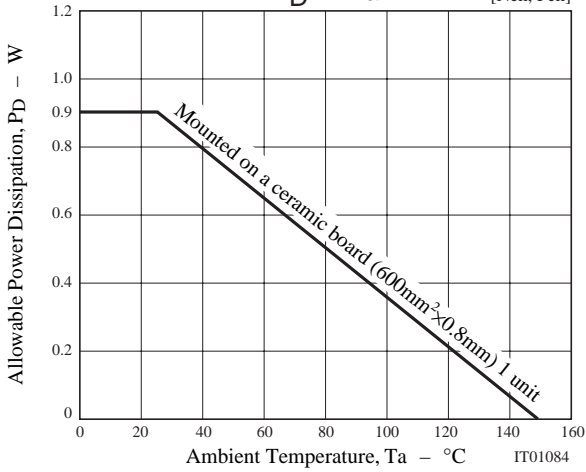
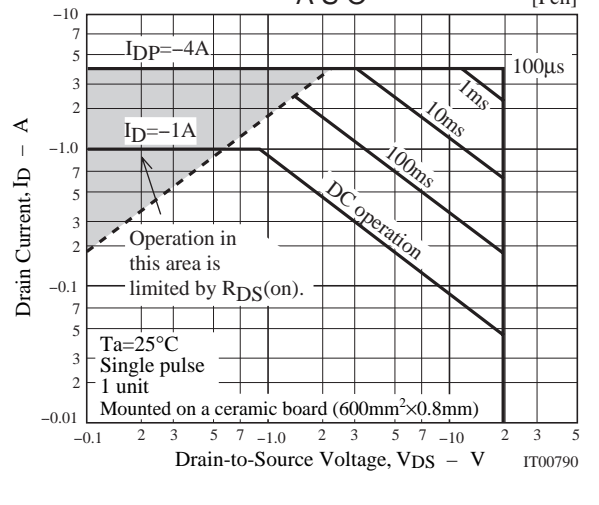
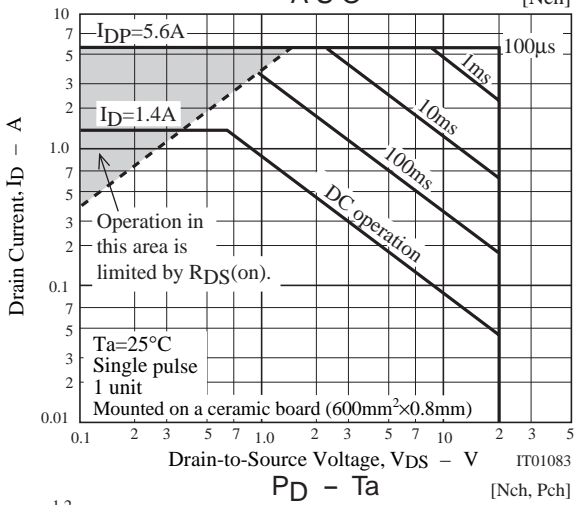
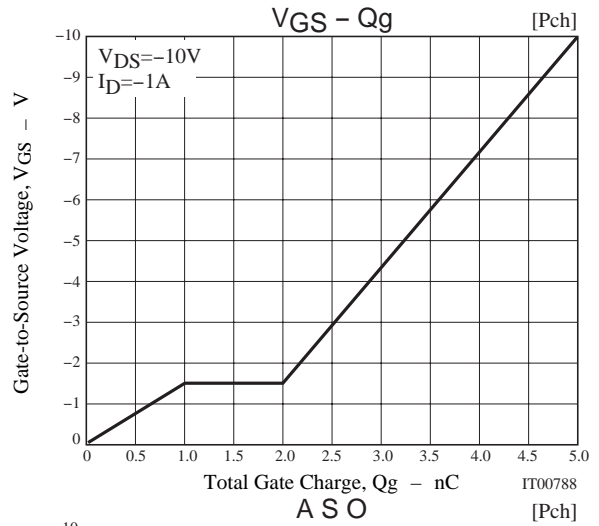
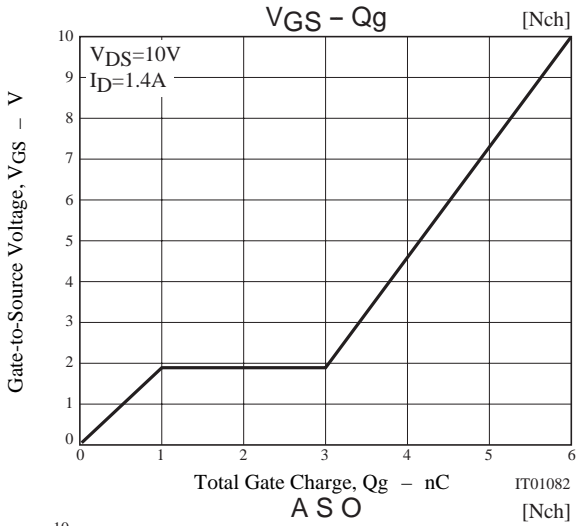
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