

Ordering number : ENN6920

N-Channel and P-Channel Silicon MOSFETs



MCH6613

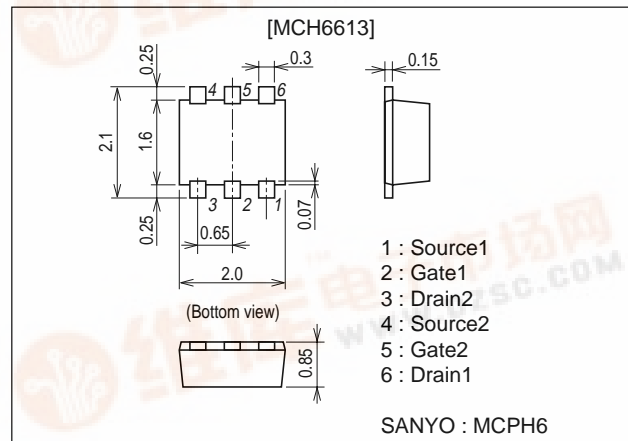
Ultrahigh-Speed Switching Applications

Features

- The MCH6613 incorporates an N-channel MOSFET and a P-channel MOSFET that feature low ON-resistance and high-speed switching, thereby enabling high-density mounting.
- Excellent ON-resistance characteristic.
- 2.5V drive.

Package Dimensions

unit : mm
2173A



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}		±10	±10	V
Drain Current (DC)	I _D		0.35	-0.2	A
Drain Current (Pulse)	I _{DP}	PW≤10μs, duty cycle≤1%	1.4	-0.8	A
Allowable Power Dissipation	P _D	Mounted on a ceramic board (90mm²X0.8mm)1unit	0.8		W
Channel Temperature	T _{ch}		150		°C
Storage Temperature	T _{stg}		-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			10	μA
Gate-to-Source Leakage Current	I _{GSS}	V _{GS} =±8V, V _{DS} =0			±10	μA
Cutoff Voltage	V _{GS(off)}	V _{DS} =10V, I _D =100μA	0.4		1.3	V
Forward Transfer Admittance	y _{fs}	V _{DS} =10V, I _D =80mA	150	220		mS
Static Drain-to-Source On-State Resistance	R _{DS(on)1}	I _D =80mA, V _{GS} =4V		2.9	3.7	Ω
	R _{DS(on)2}	I _D =40mA, V _{GS} =2.5V		3.7	5.2	Ω
	R _{DS(on)3}	I _D =10mA, V _{GS} =1.5V		6.4	12.8	Ω

Marking : FM

Continued on next page.

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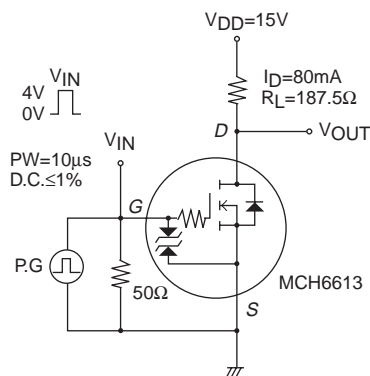
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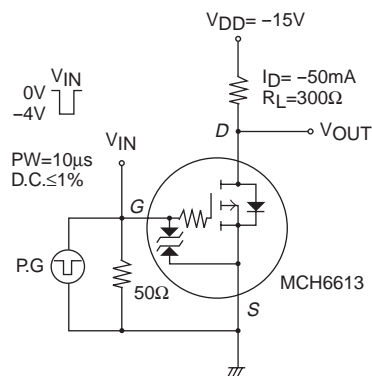
Parameter	Symbol	Conditions	Ratings			Unit
			min	typ	max	
Input Capacitance	Ciss	$V_{DS}=10V, f=1MHz$		7.0		pF
Output Capacitance	Coss	$V_{DS}=10V, f=1MHz$		5.9		pF
Reverse Transfer Capacitance	Crss	$V_{DS}=10V, f=1MHz$		2.3		pF
Turn-ON Delay Time	$t_d(on)$	See specified Test Circuit		19		ns
Rise Time	t_r	See specified Test Circuit		65		ns
Turn-OFF Delay Time	$t_d(off)$	See specified Test Circuit		155		ns
Fall Time	t_f	See specified Test Circuit		120		ns
Total Gate Charge	Qg	$V_{DS}=10V, V_{GS}=10V, I_D=150mA$		1.58		nC
Gate-to-Source Charge	Qgs	$V_{DS}=10V, V_{GS}=10V, I_D=150mA$		0.26		nC
Gate-to-Drain "Miller" Charge	Qgd	$V_{DS}=10V, V_{GS}=10V, I_D=150mA$		0.31		nC
Diode Forward Voltage	VSD	$I_S=150mA, V_{GS}=0$		0.87	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}	$V_{DS}=-30V, V_{GS}=0$			-10	μA
Gate-to-Source Leakage Current	I_{GSS}	$V_{GS}=\pm 8V, V_{DS}=0$			± 10	μA
Cutoff Voltage	$V_{GS(off)}$	$V_{DS}=-10V, I_D=-100\mu A$	-0.4		-1.4	V
Forward Transfer Admittance	$ y_{fs} $	$V_{DS}=-10V, I_D=-50mA$	80	110		mS
Static Drain-to-Source On-State Resistance	$R_{DS(on)1}$	$I_D=-50mA, V_{GS}=-4V$		8	10.4	Ω
	$R_{DS(on)2}$	$I_D=-30mA, V_{GS}=-2.5V$		11	15.4	Ω
	$R_{DS(on)3}$	$I_D=-1mA, V_{GS}=-1.5V$		27	54	Ω
Input Capacitance	Ciss	$V_{DS}=-10V, f=1MHz$		7.5		pF
Output Capacitance	Coss	$V_{DS}=-10V, f=1MHz$		5.7		pF
Reverse Transfer Capacitance	Crss	$V_{DS}=-10V, f=1MHz$		1.8		pF
Turn-ON Delay Time	$t_d(on)$	See specified Test Circuit		24		ns
Rise Time	t_r	See specified Test Circuit		55		ns
Turn-OFF Delay Time	$t_d(off)$	See specified Test Circuit		120		ns
Fall Time	t_f	See specified Test Circuit		130		ns
Total Gate Charge	Qg	$V_{DS}=-10V, V_{GS}=-10V, I_D=-100mA$		1.43		nC
Gate-to-Source Charge	Qgs	$V_{DS}=-10V, V_{GS}=-10V, I_D=-100mA$		0.18		nC
Gate-to-Drain "Miller" Charge	Qgd	$V_{DS}=-10V, V_{GS}=-10V, I_D=-100mA$		0.25		nC
Diode Forward Voltage	VSD	$I_S=-100mA, V_{GS}=0$		-0.83	-1.2	V

Switching Time Test Circuit

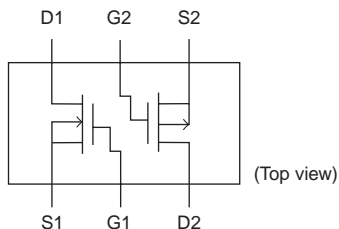
[N-channel]



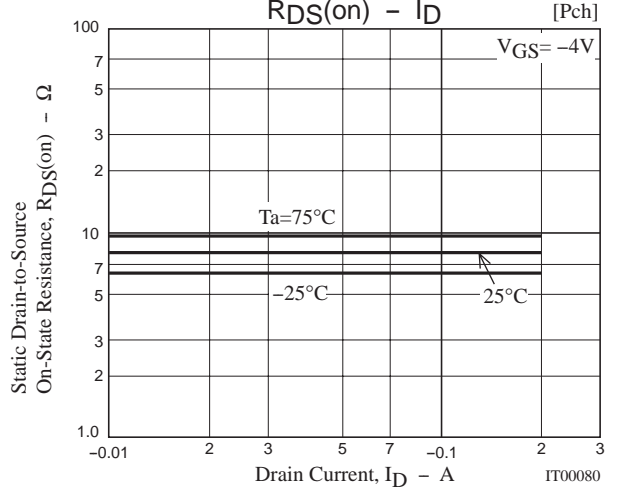
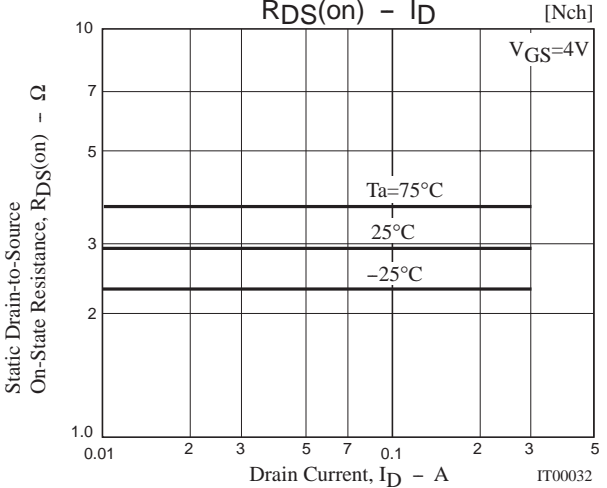
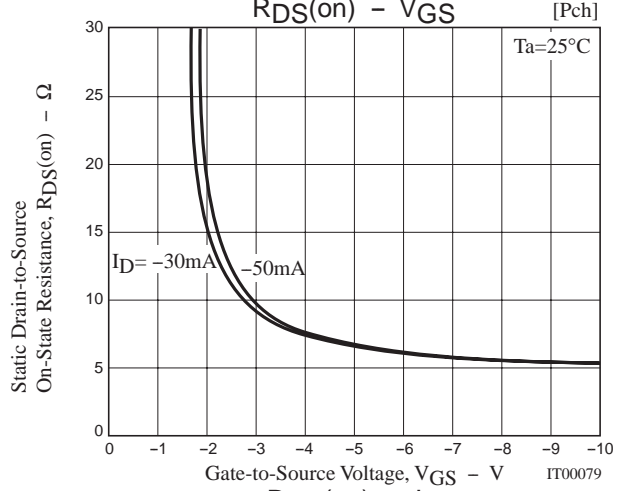
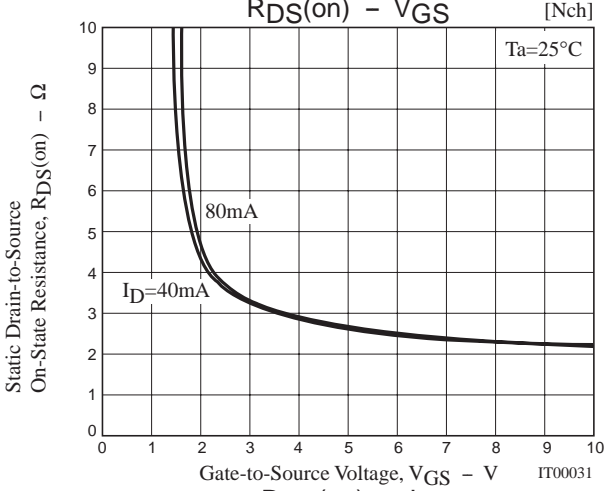
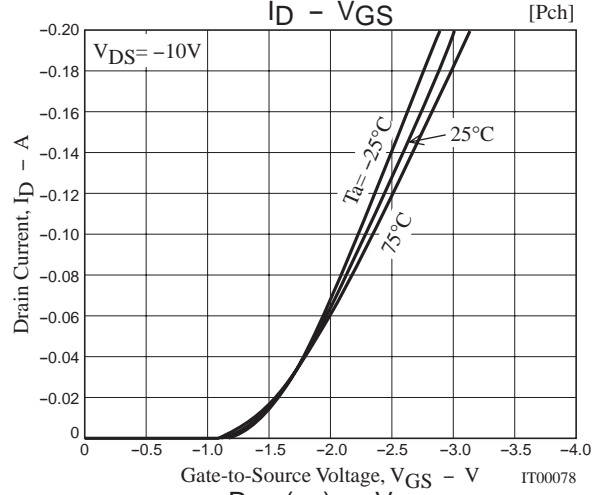
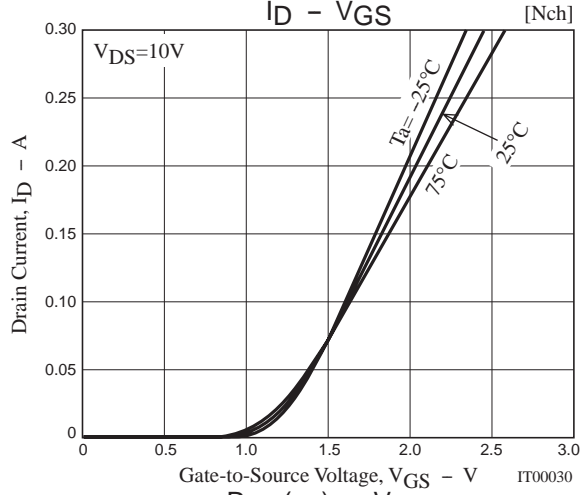
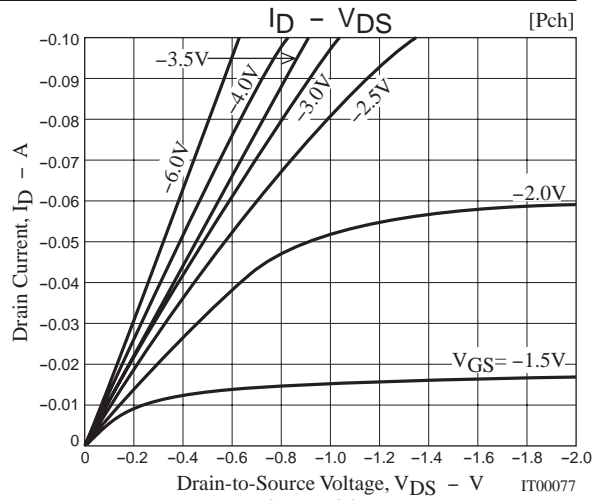
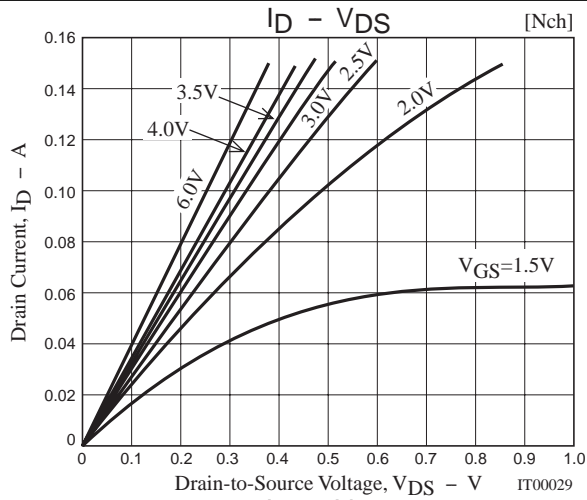
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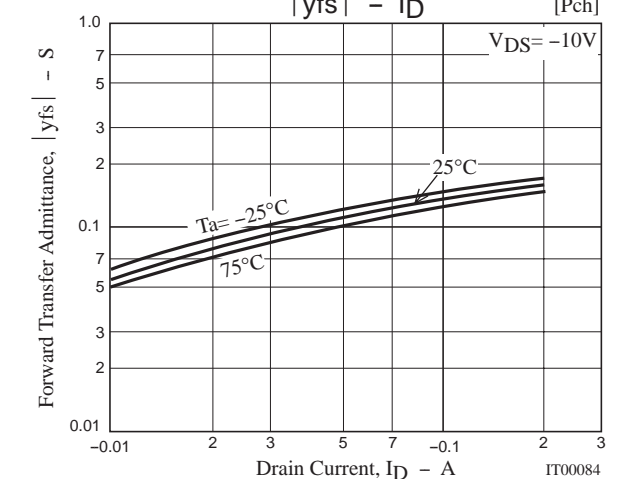
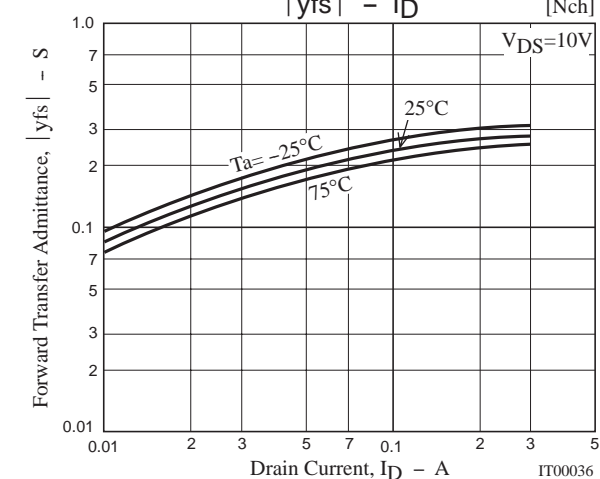
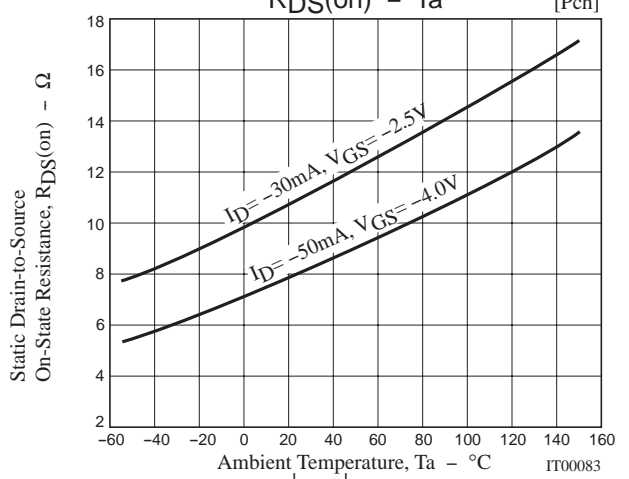
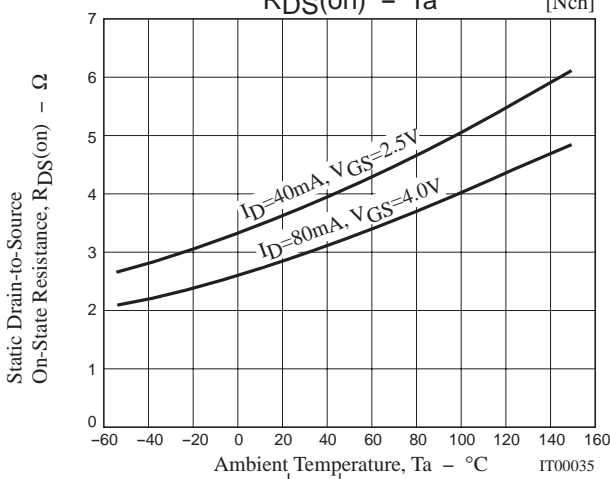
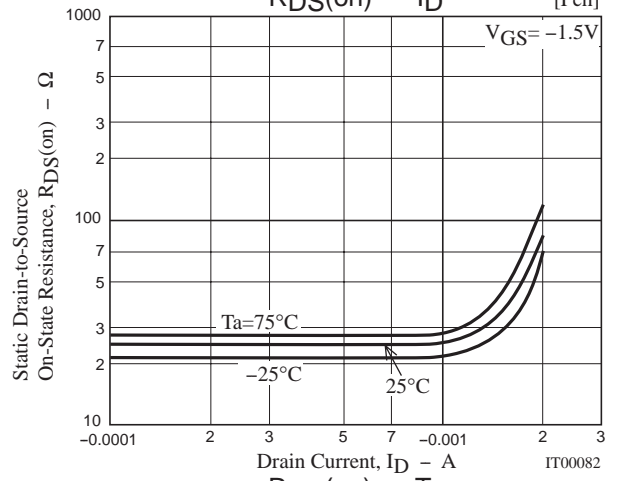
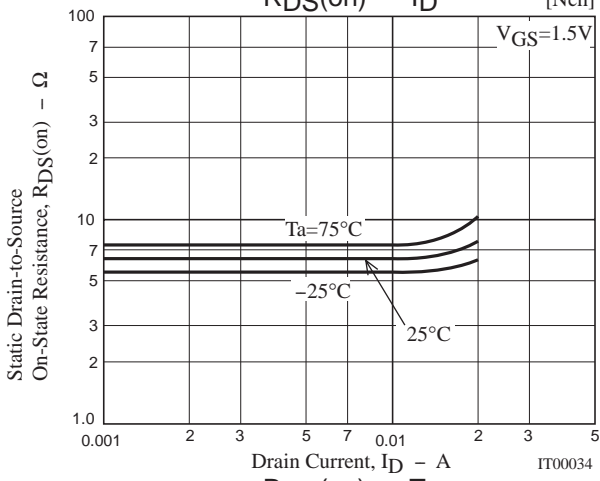
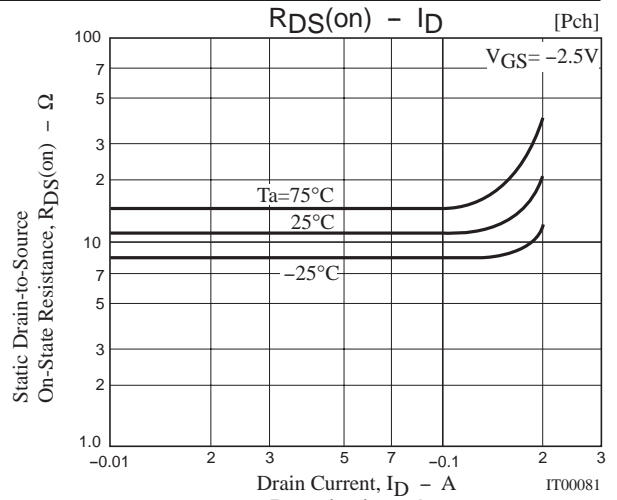
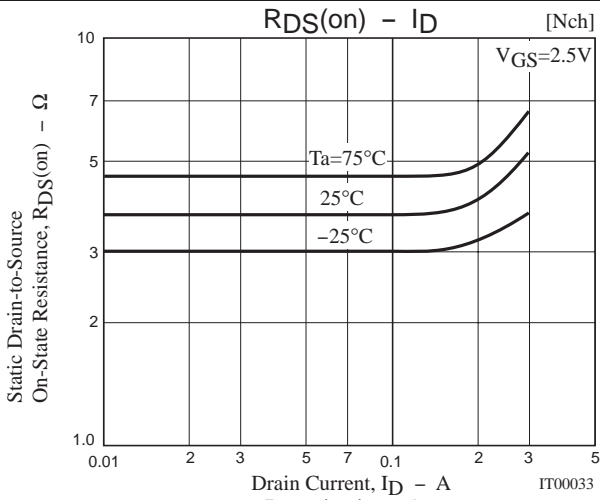
Electrical Connection



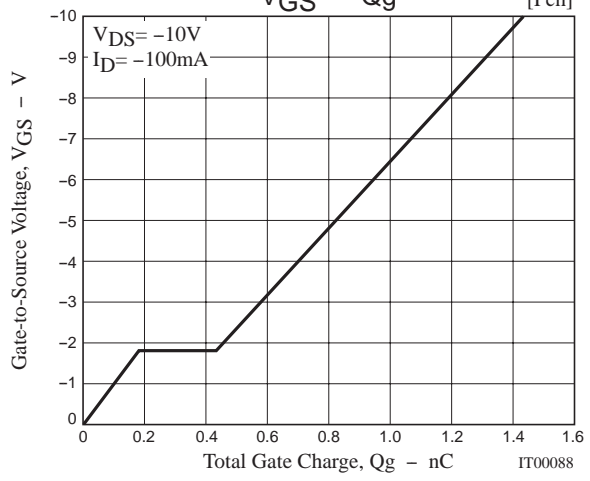
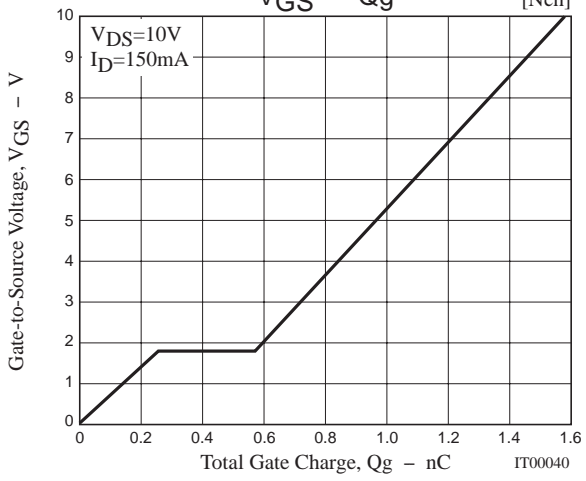
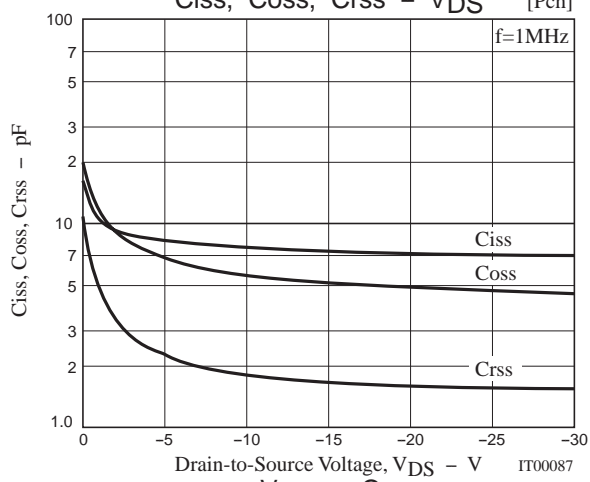
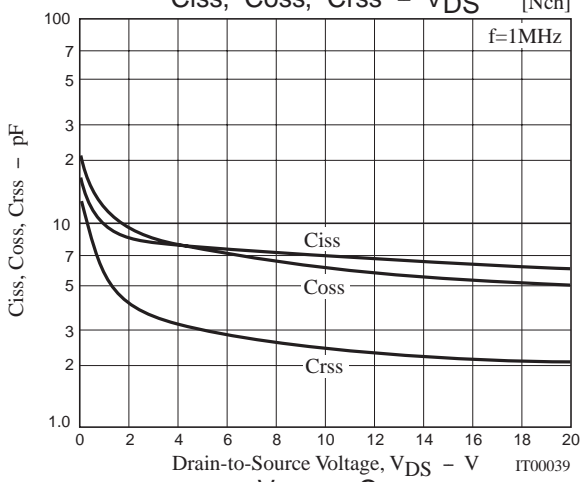
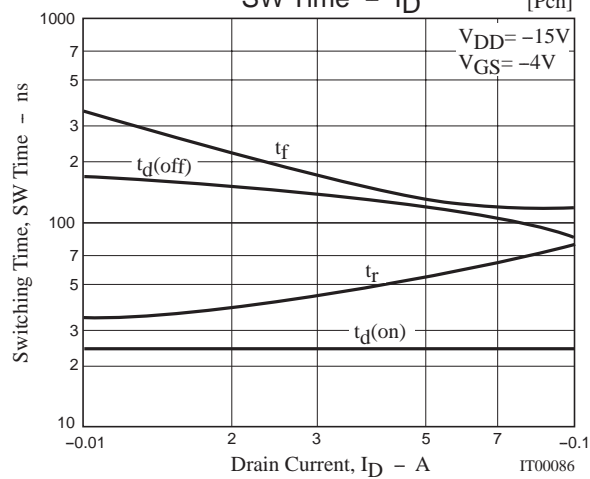
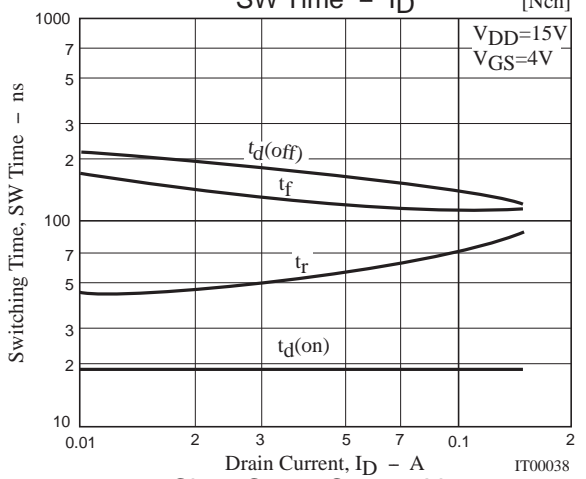
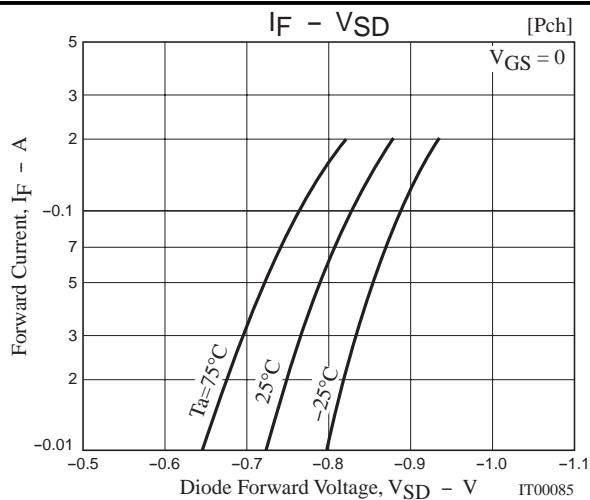
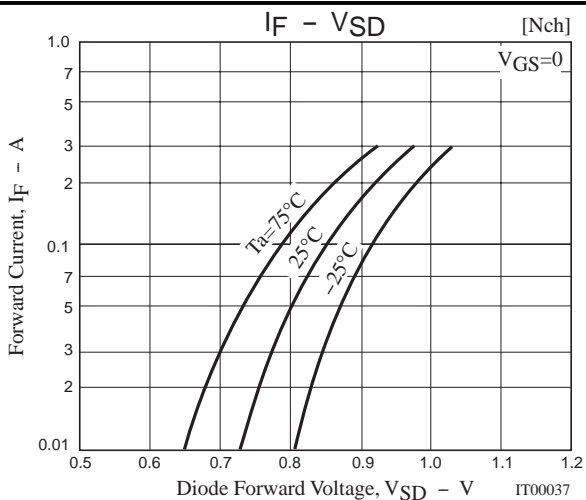
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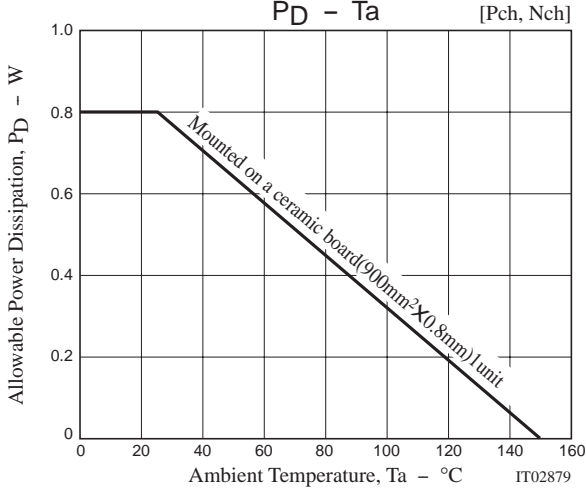
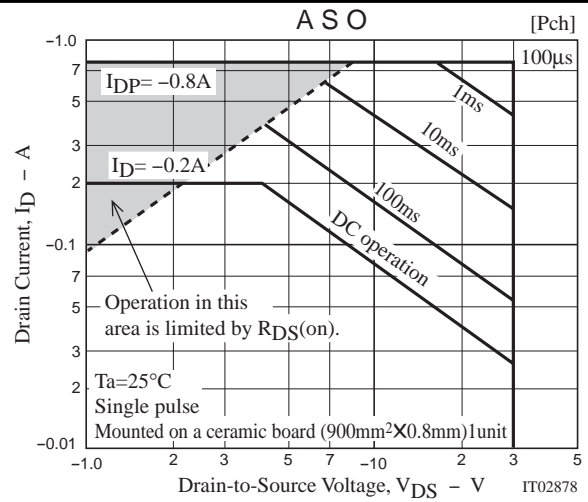
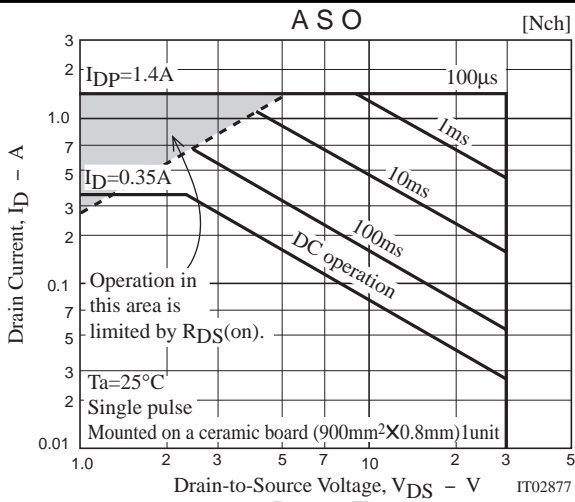
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