

**MCH6614**

Ultrahigh-Speed Switching Applications

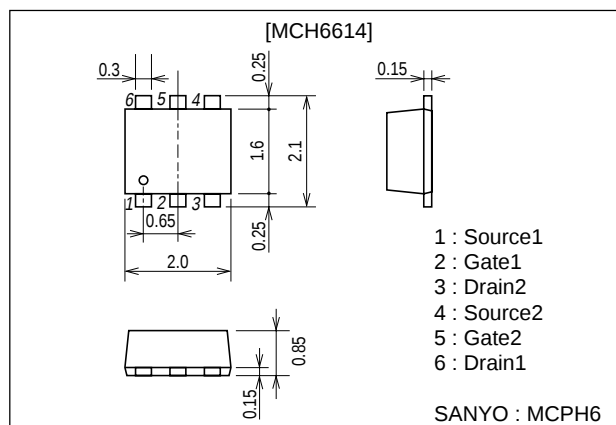
Features

- The MCH6614 incorporates two elements that are an N-channel and a P-channel MOSFETs that feature low ON resistance and high-speed switching, thereby enabling high-density mounting.
- Low ON-resistance.
- 2.5V drive.

Package Dimensions

unit : mm

2173



Specifications

Absolute Maximum Ratings at Ta=25°C

Parameter	Symbol	Conditions	N-channel	P-channel	Unit
Drain-to-Source Voltage	V_{DS}		30	-30	V
Gate-to-Source Voltage	V_{GS}		± 10	± 10	V
Drain Current (DC)	I_D		0.35	-0.4	A
Drain Current (Pulse)	I_{DP}	$PW \leq 10\mu s$, duty cycle $\leq 1\%$	1.4	-1.6	A
Allowable Power Dissipation	P_D	Mounted on a ceramic board (900mm ² X 0.8mm) 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	ID=1mA, VGS=0	30			V
Zero-Gate Voltage Drain Current	IDSS	VDS=30V, VGS=0			10	μA
Gate-to-Source Leakage Current	IGSS	VGS=±8V, VDS=0			±10	μA
Cutoff Voltage	VGS(off)	VDS=10V, ID=100μA	0.4		1.3	V
Forward Transfer Admittance	yfs	VDS=10V, ID=80mA	150	220		mS
Static Drain-to-Source On-State Resistance	RDS(on)1	ID=80mA, VGS=4V		2.9	3.7	Ω
	RDS(on)2	ID=40mA, VGS=2.5V		3.7	5.2	Ω
	RDS(on)3	ID=10mA, VGS=1.5V		6.4	12.8	Ω

Marking : FN

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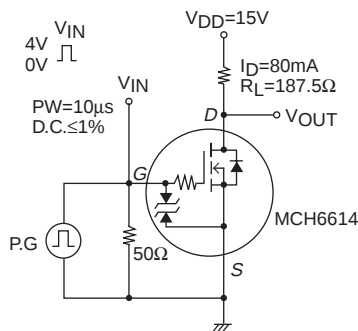
MCH6614

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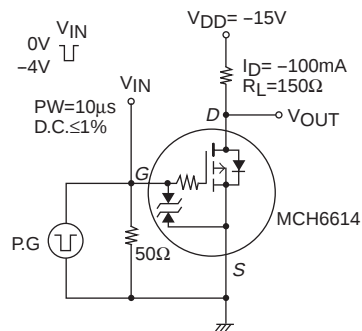
Parameter	Symbol	Conditions	Ratings			Unit
			min	typ	max	
Input Capacitance	Ciss	$V_{DS}=10V, f=1MHz$		7.0		pF
Output Capacitance	Coss	$V_{DS}=10V, f=1MHz$		5.9		pF
Reverse Transfer Capacitance	Crss	$V_{DS}=10V, f=1MHz$		2.3		pF
Turn-ON Delay Time	$t_d(on)$	See specified Test Circuit		19		ns
Rise Time	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	V_{SD}	$I_S=150mA, V_{GS}=0$		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} $	$V_{DS}=-10V, I_D=-100mA$	210	300		mS
Static Drain-to-Source On-State Resistance	$R_{DS(on)1}$	$I_D=-100mA, V_{GS}=-4V$		2.4	3.1	Ω
	$R_{DS(on)2}$	$I_D=-50mA, V_{GS}=-2.5V$		3.5	4.9	Ω
	$R_{DS(on)3}$	$I_D=-10mA, V_{GS}=-1.5V$		10	20	Ω
Input Capacitance	Ciss	$V_{DS}=-10V, f=1MHz$		28		pF
Output Capacitance	Coss	$V_{DS}=-10V, f=1MHz$		15		pF
Reverse Transfer Capacitance	Crss	$V_{DS}=-10V, f=1MHz$		5.2		pF
Turn-ON Delay Time	$t_d(on)$	See specified Test Circuit		24		ns
Rise Time	t_r	See specified Test Circuit		75		ns
Turn-OFF Delay Time	$t_d(off)$	See specified Test Circuit		200		ns
Fall Time	t_f	See specified Test Circuit		150		ns
Total Gate Charge	Qg	$V_{DS}=-10V, V_{GS}=-10V, I_D=-200mA$		2		nC
Gate-to-Source Charge	Qgs	$V_{DS}=-10V, V_{GS}=-10V, I_D=-200mA$		0.25		nC
Gate-to-Drain "Miller" Charge	Qgd	$V_{DS}=-10V, V_{GS}=-10V, I_D=-200mA$		0.35		nC
Diode Forward Voltage	V_{SD}	$I_S=-200mA, V_{GS}=0$		-0.82	-1.2	V

Switching Time Test Circuit

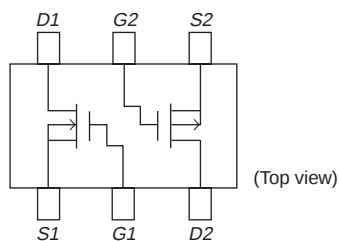
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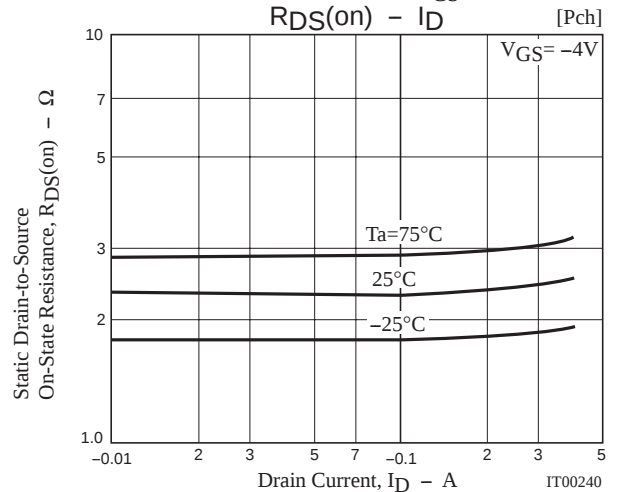
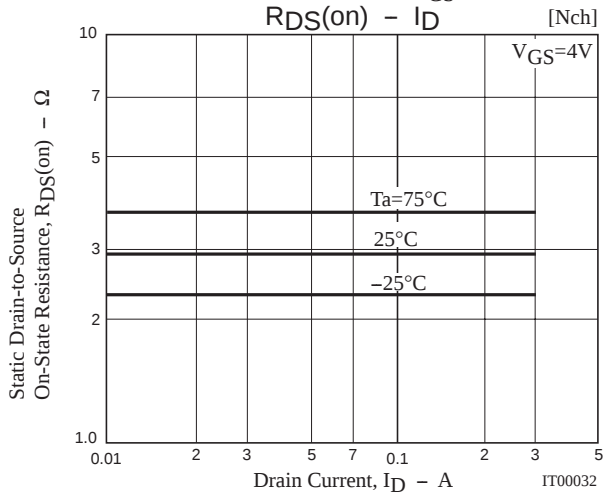
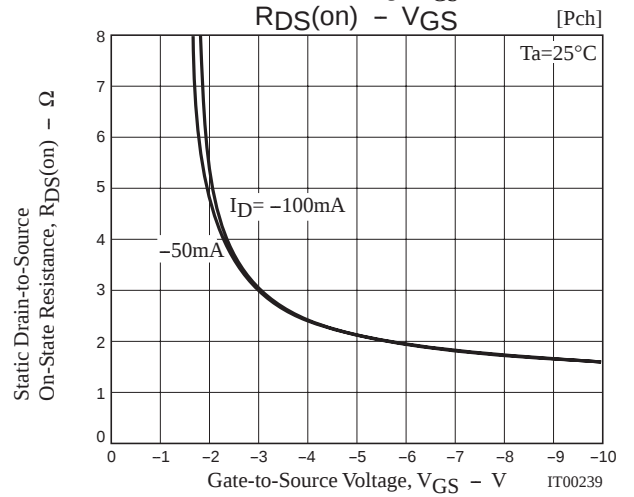
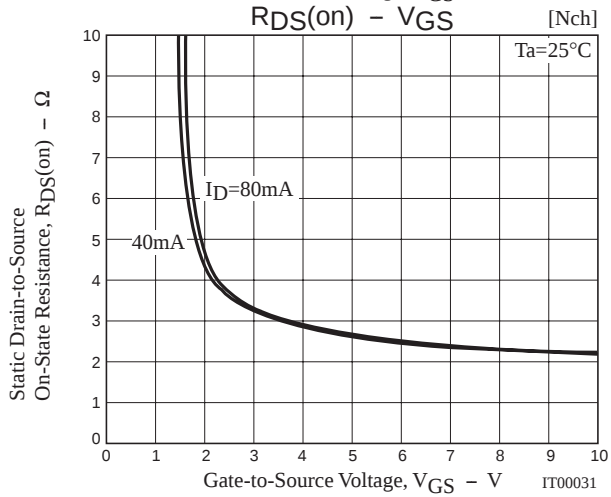
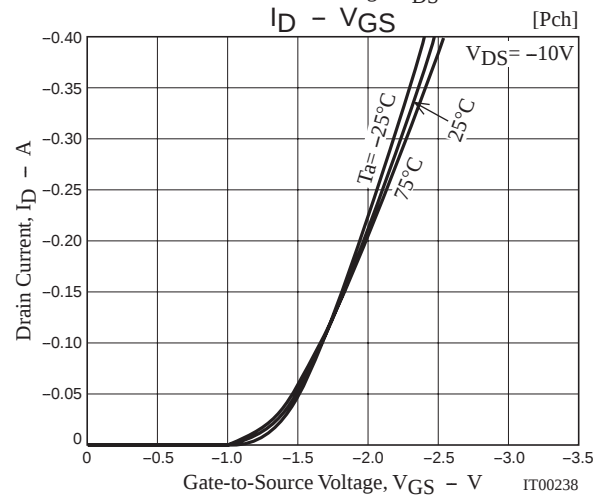
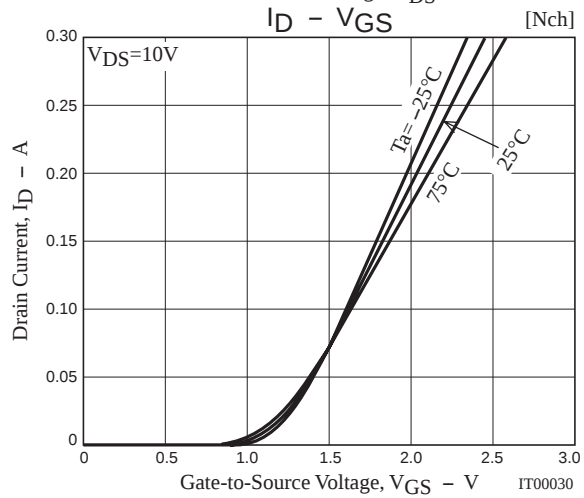
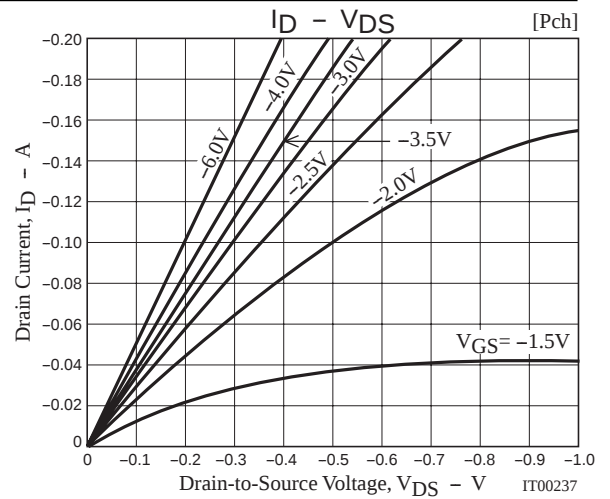
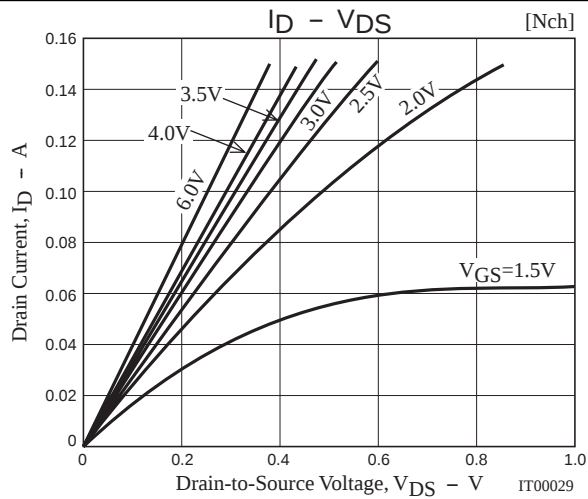


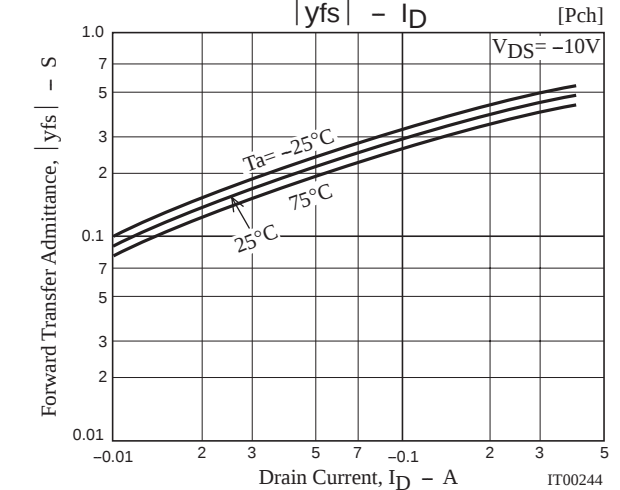
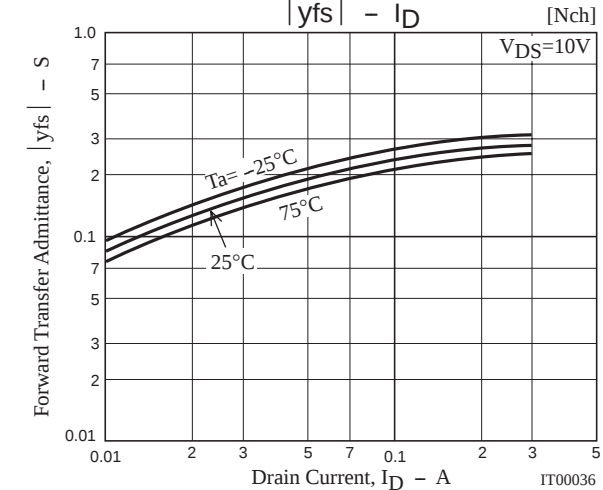
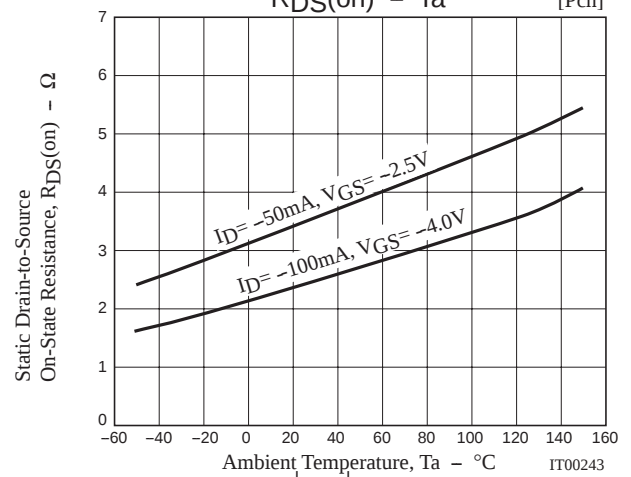
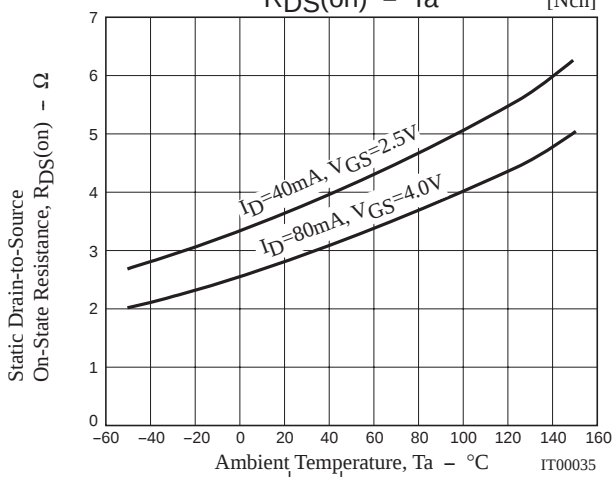
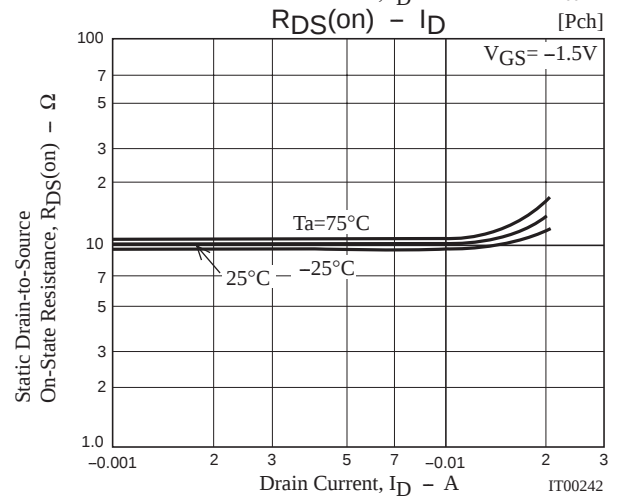
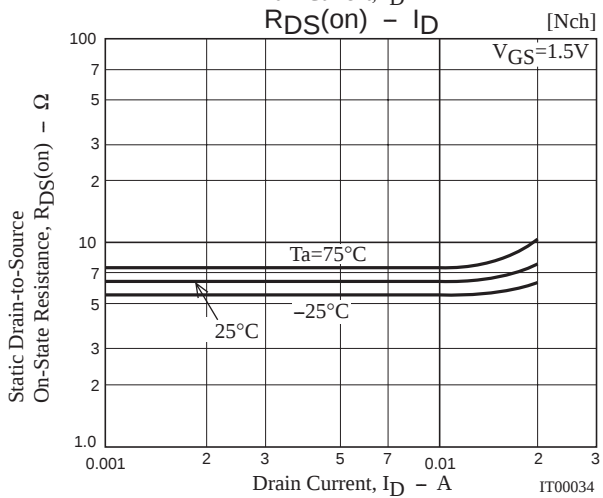
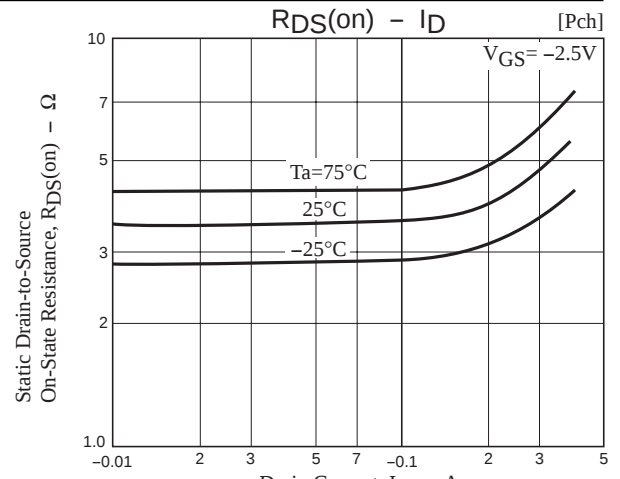
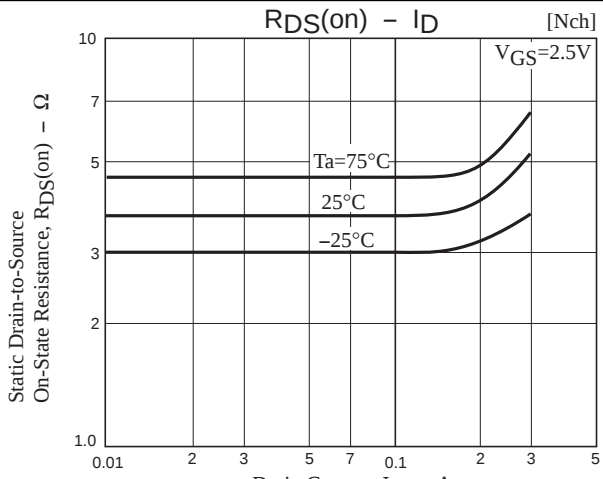
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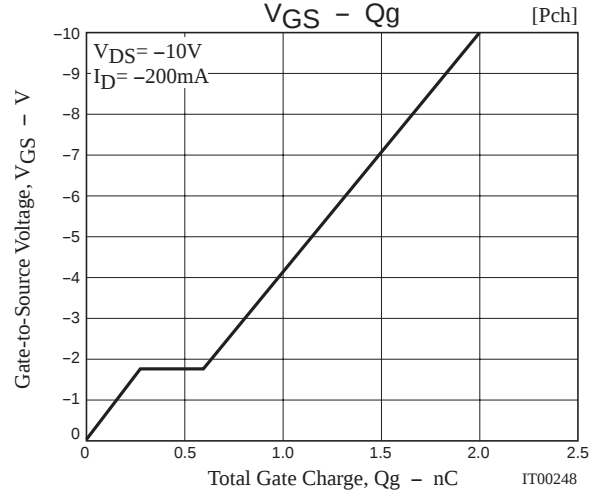
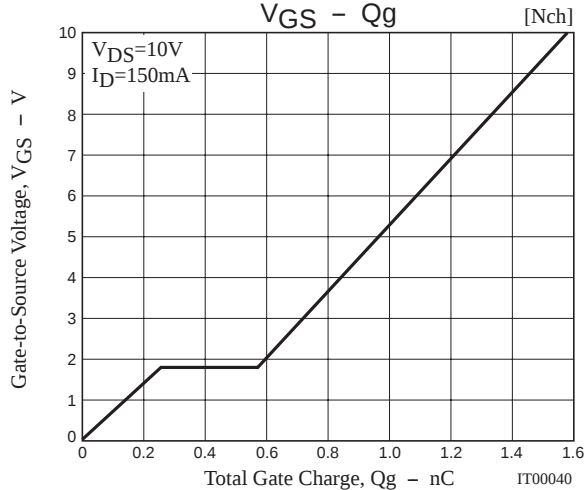
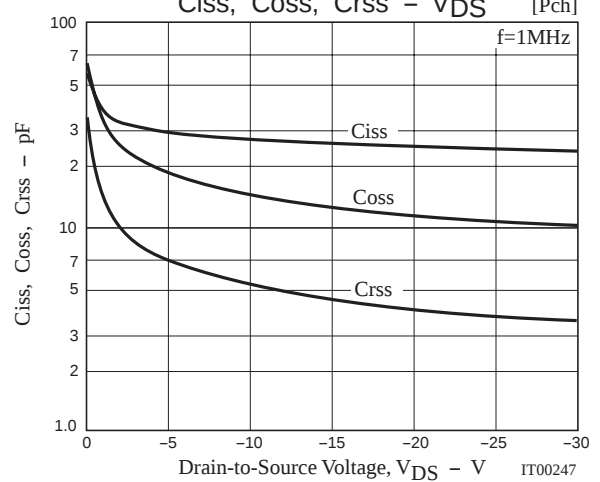
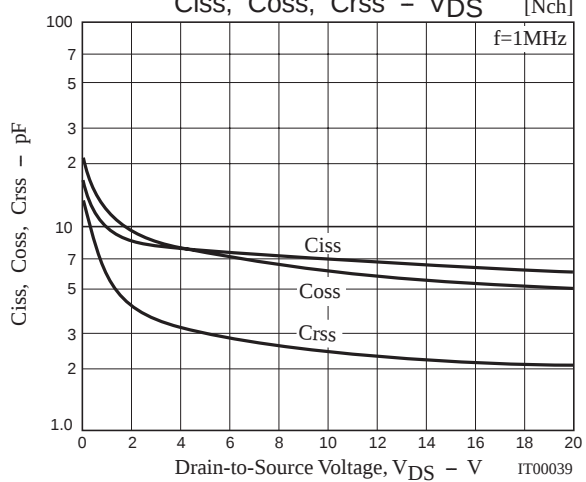
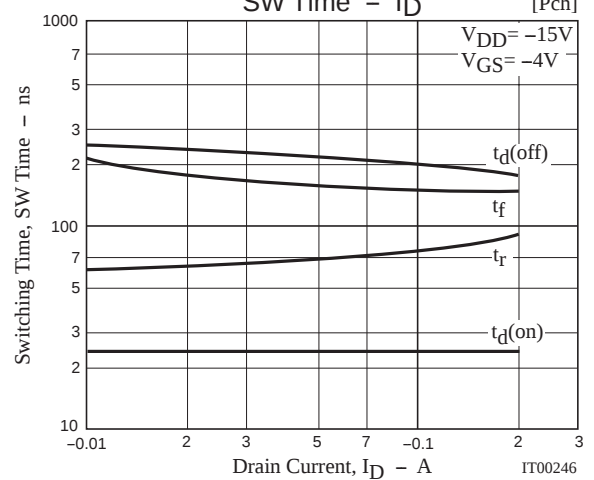
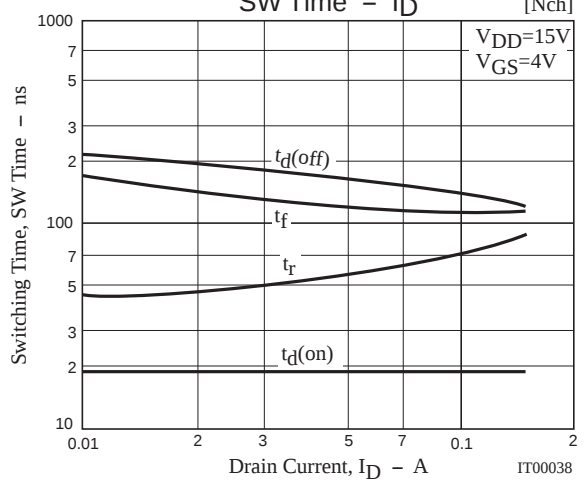
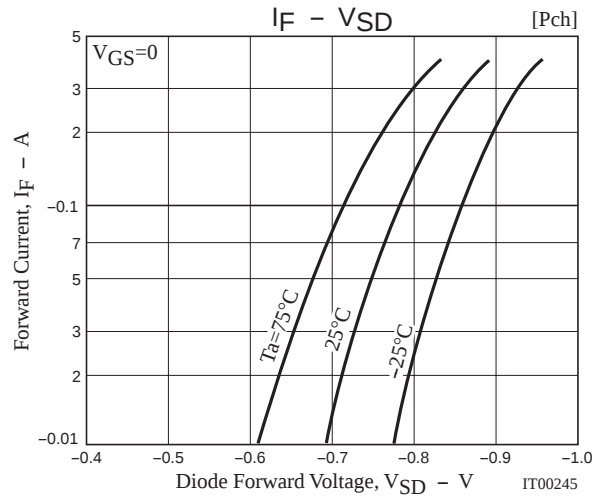
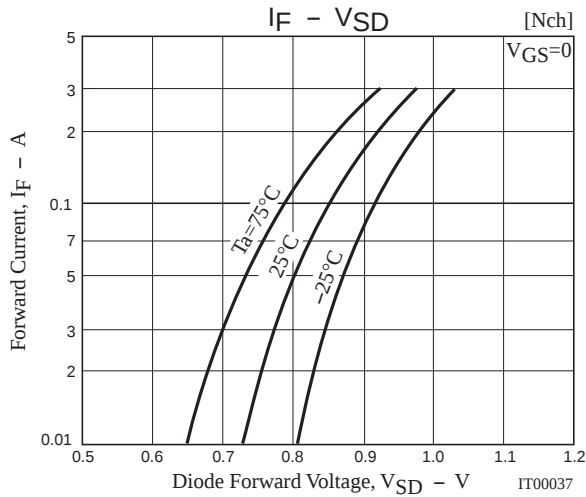
Electrical Connection



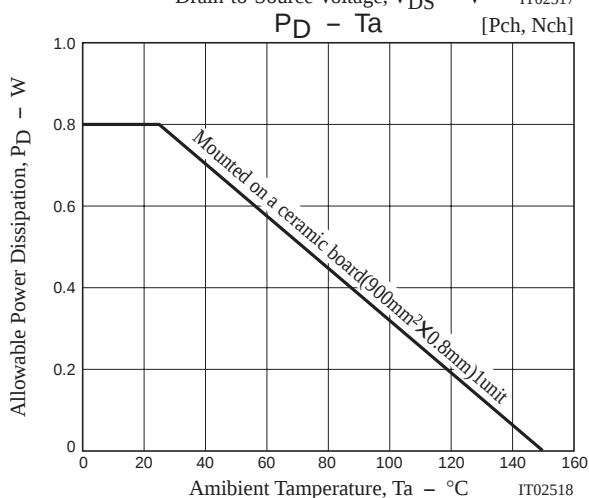
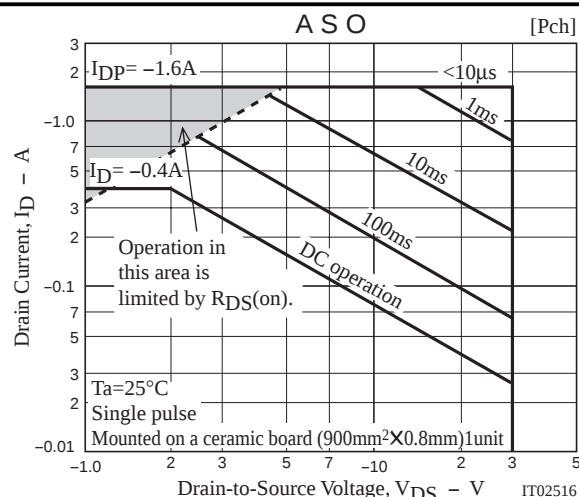
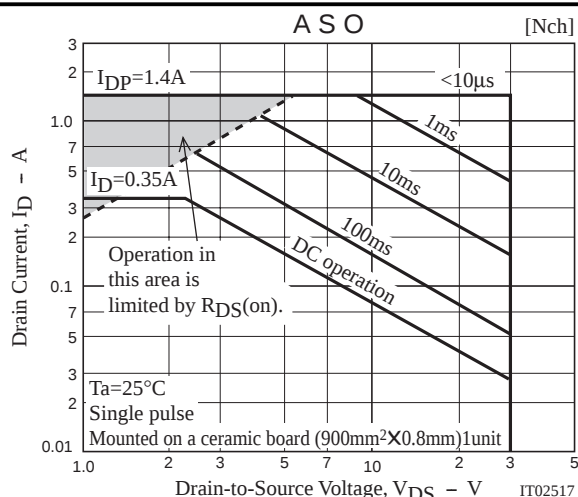




MCH6614



MCH6614



Note on usage : Since the MCH6614 is designed for high-speed switching applications, please avoid using this device in the vicinity of highly charged objects.

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