Ordering number : ENN6795

N-Channel and P-Channel Silicon MOSFET

MCH6614

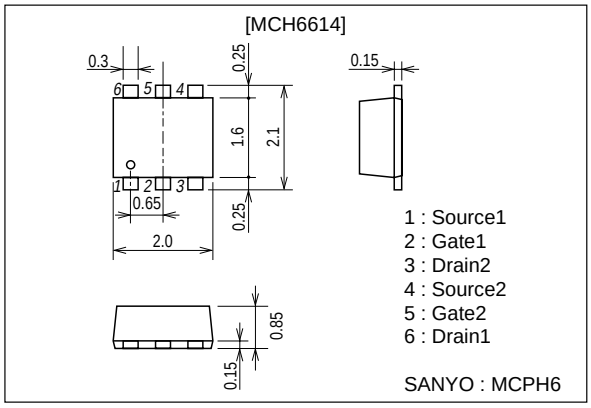
Ultrahigh-Speed Switching Applications

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_{DSS}		30	−30	V
Gate-to-Source Voltage	V_{GSS}		±10	±10	V
Drain Current (DC)	I_D		0.35	−0.4	A
Drain Current (Pulse)	I_{DP}	PW≤10μs, duty cycle≤1%	1.4	−1.6	A
Allowable Power Dissipation	P_D	Mounted on a ceramic board (900mm²X0.8mm)1unit	0.8		W
Channel Temperature	Tch		150		°C
Storage Temperature	Tstg		−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	$\|yfs\|$	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 : FN

Continued on next page.

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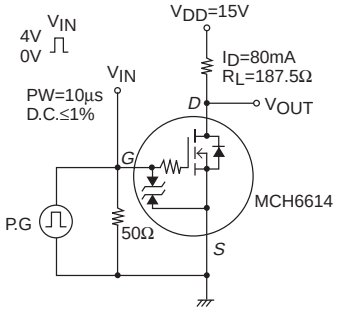
Continued from preceding page.

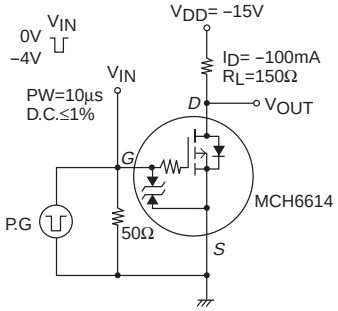
Parameter	Symbol	Conditions	Ratings			Unit
			min	typ	max	
Input Capacitance	Ciss	V_{DS}=10V, f=1MHz		7.0		pF
Output Capacitance	Coss	V_{DS}=10V, f=1MHz		5.9		pF
Reverse Transfer Capacitance	Crss	V_{DS}=10V, f=1MHz		2.3		pF
Turn-ON Delay Time	t_d(on)	See specified Test Circuit		19		ns
Rise Time	t_r	See 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}=±8V, V_{DS}=0			±10	μA
Cutoff Voltage	V_{GS}(off)	V_{DS}=–10V, I_D=–100μA	–0.4		–1.4	V
Forward Transfer Admittance	|yfs|	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

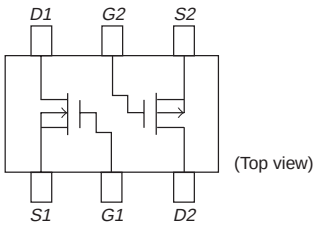
[N-channel]

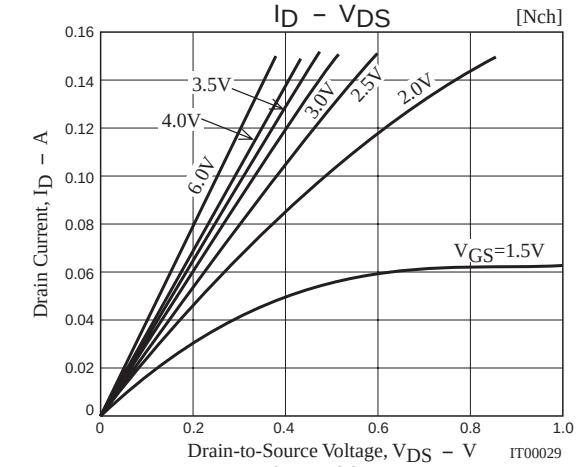


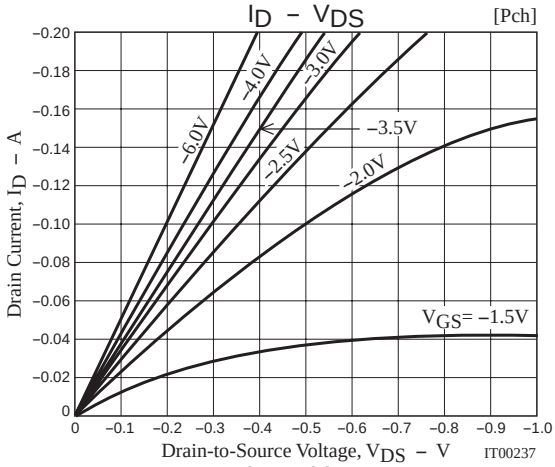
[P-channel]

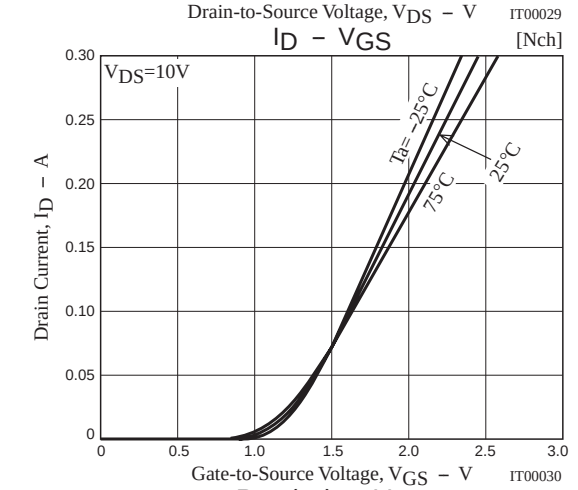


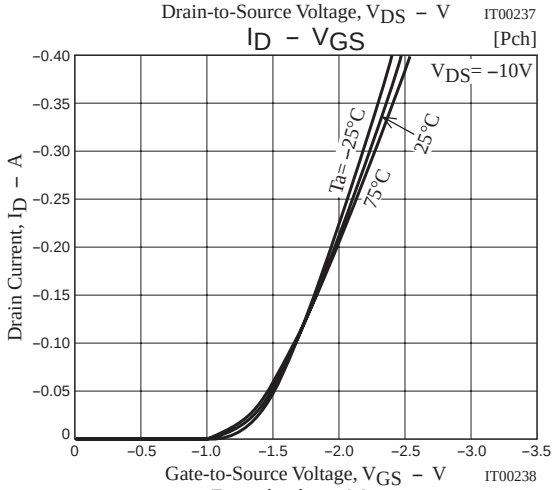
Electrical Connection

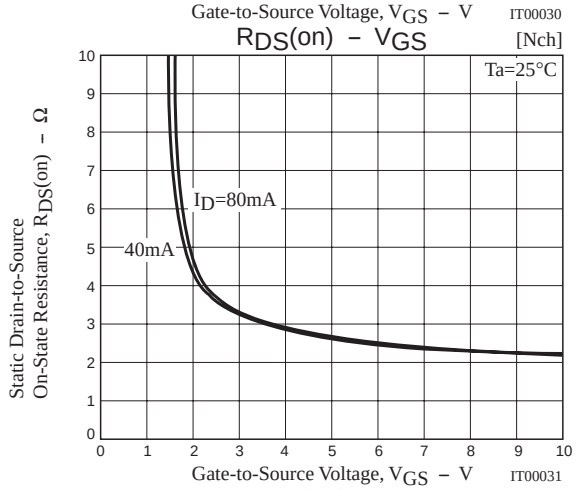


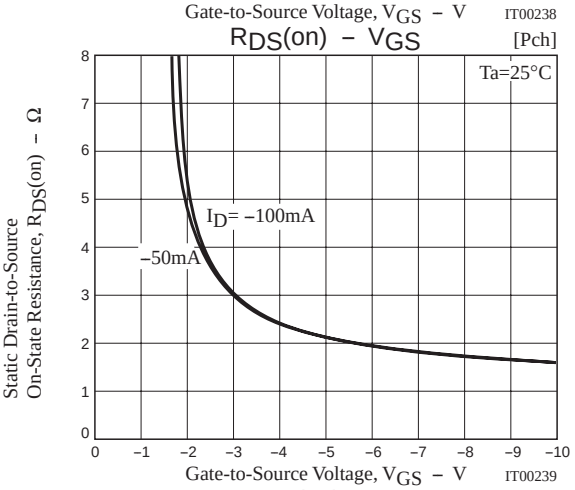


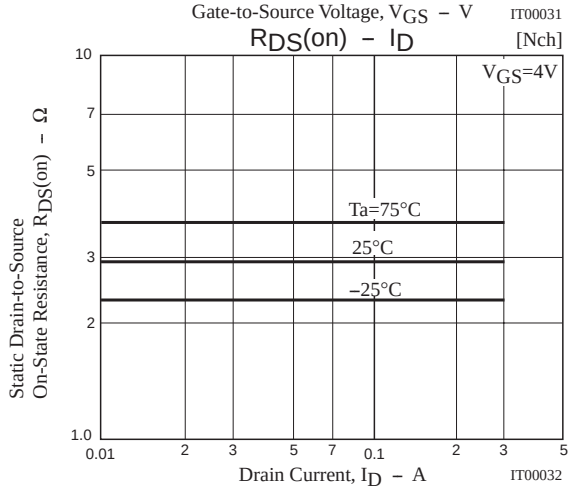


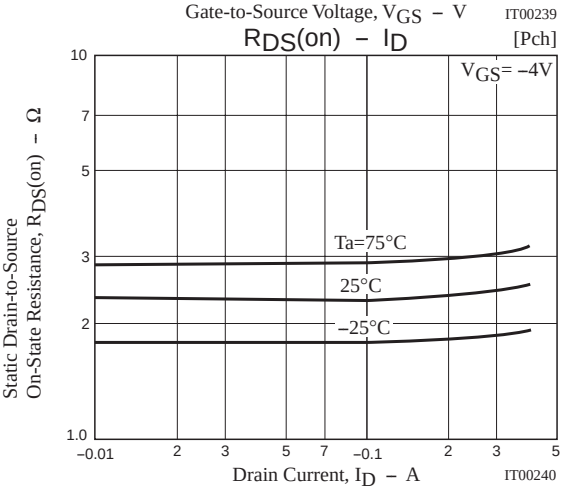


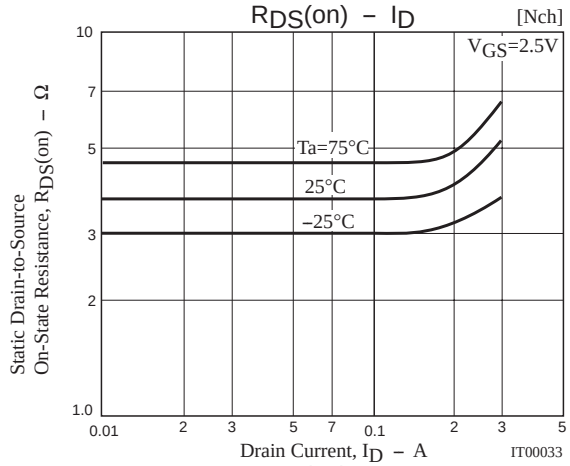


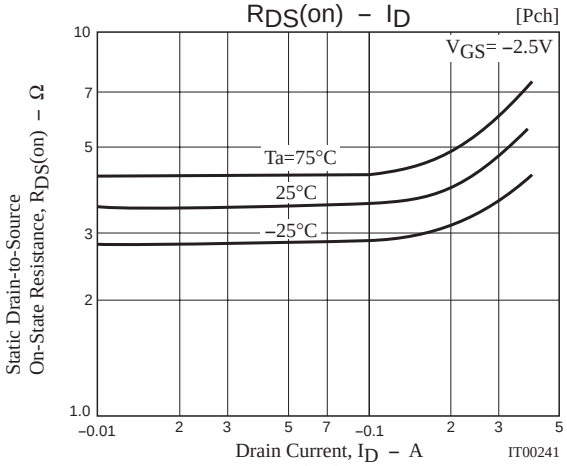


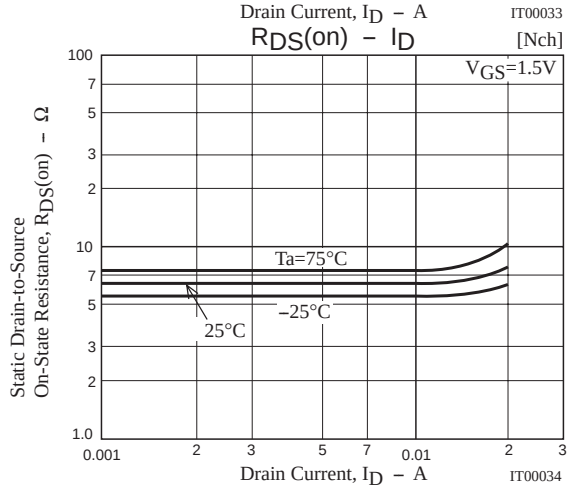


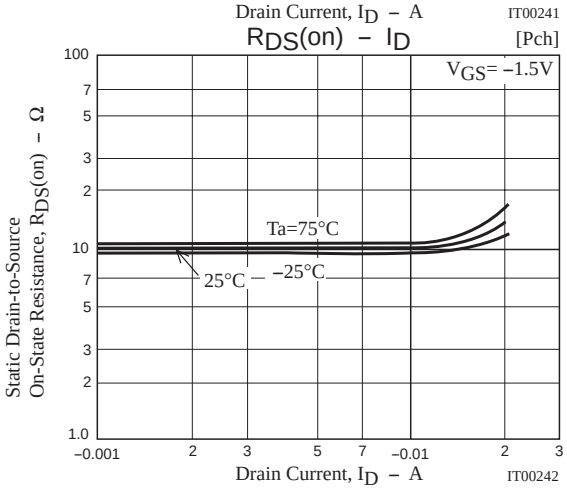


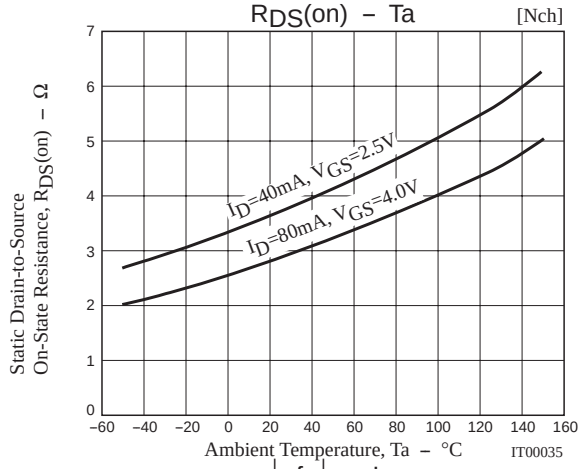


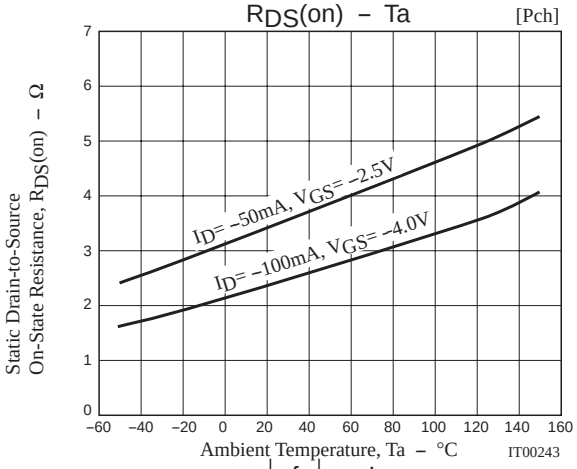


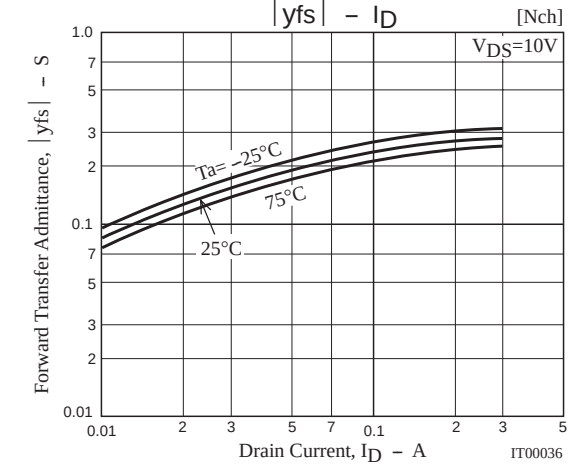


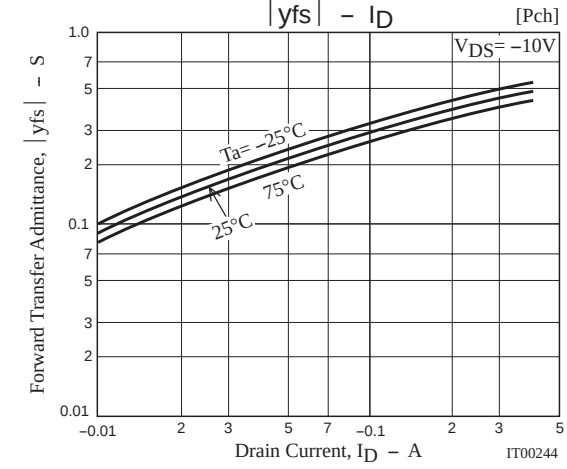


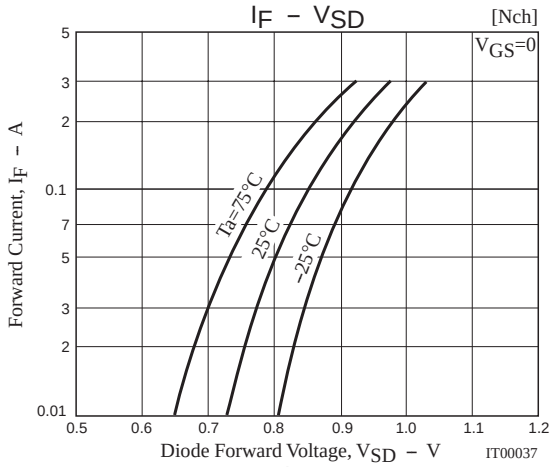


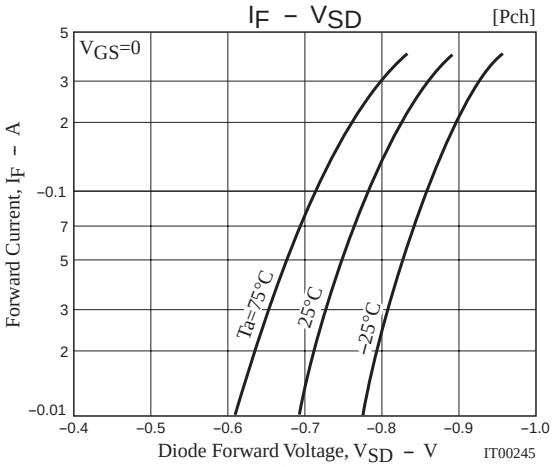


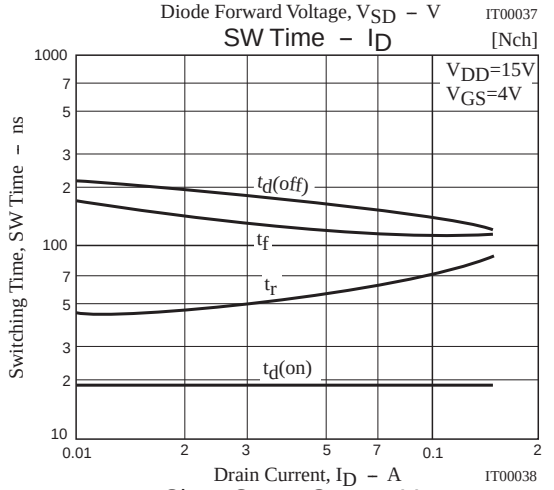


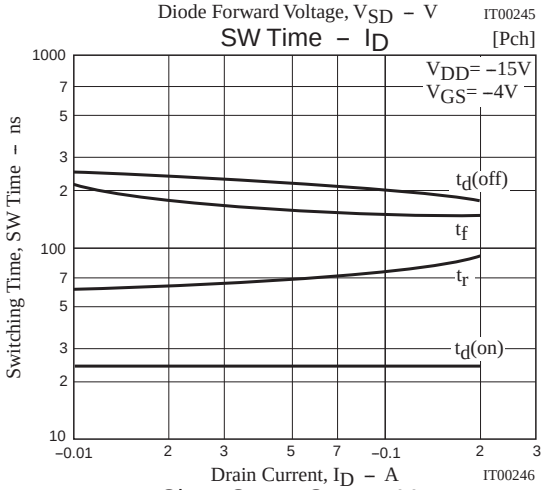


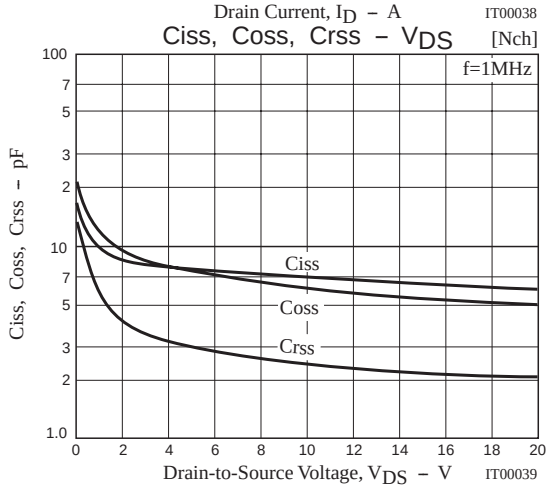


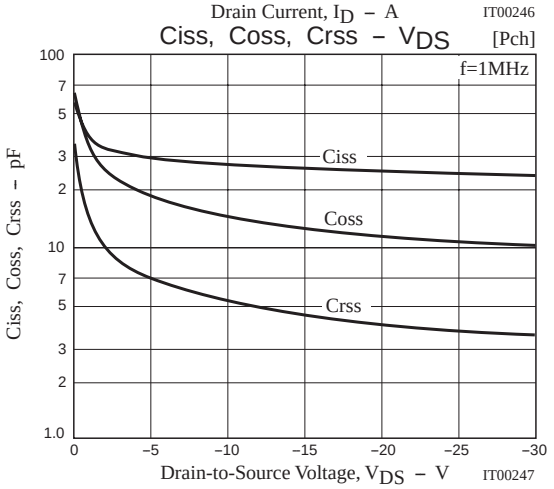


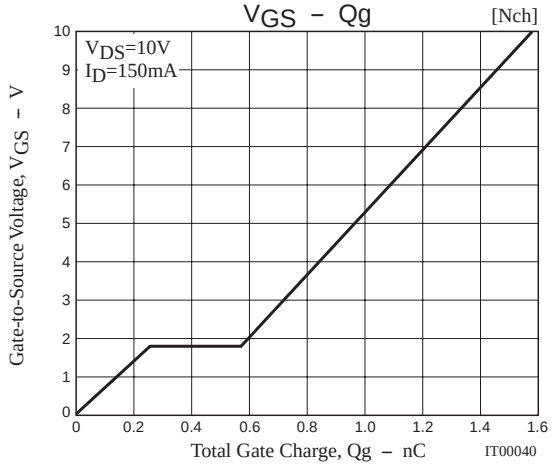


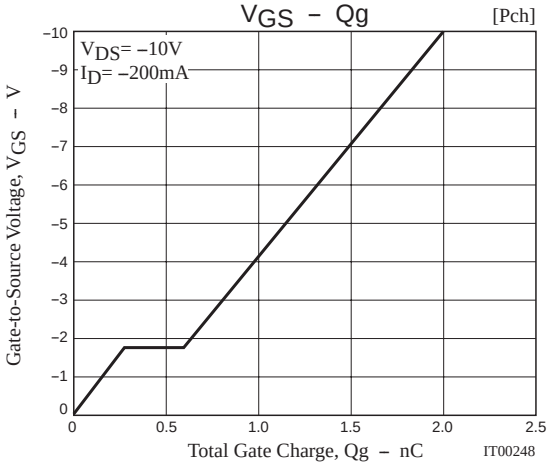


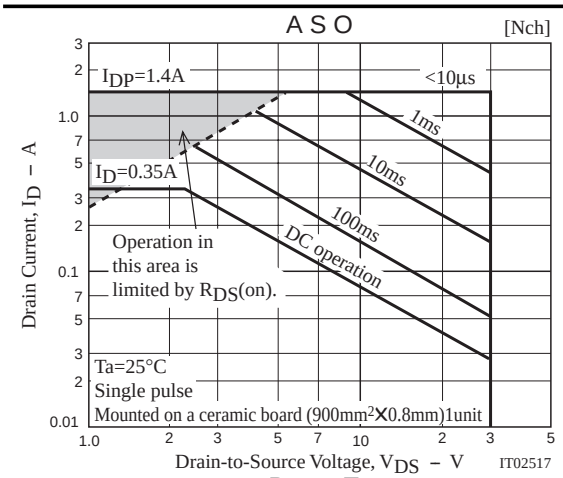


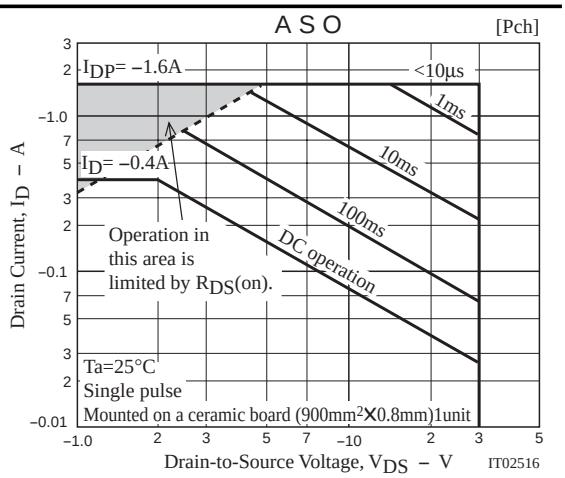


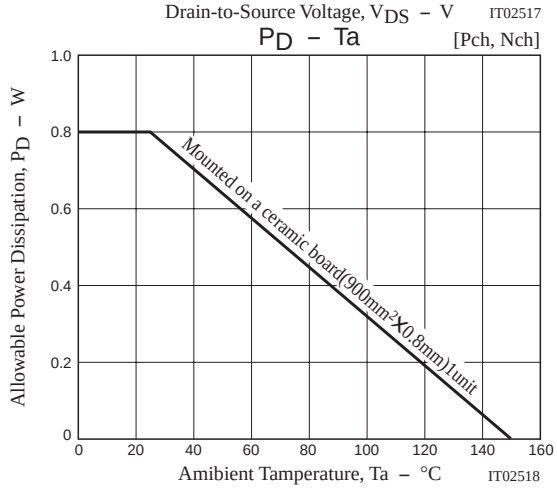












Note on usage : Since the MCH6614 is designed for high-speed switching applications, please avoid using this device in the vicinity of highly charged objects.