



# EMH2602 — General-Purpose Switching Device Applications

N-Channel and P-Channel Silicon MOSFETs

## Features

- The EMH2602 incorporates an N-channel MOSFET and a P-channel MOSFET that feature low ON-resistance and ultrahigh-speed switching, thereby enabling high-density mounting.
- 4V drive.

## Specifications

### Absolute Maximum Ratings at Ta=25°C

Parameter	Symbol	Conditions	N-channel	P-channel	Unit
Drain-to-Source Voltage	V <sub>DSS</sub>		30	-30	V
Gate-to-Source Voltage	V <sub>GSS</sub>		±20	±20	V
Drain Current (DC)	I <sub>D</sub>		3.5	-2	A
Drain Current (Pulse)	I <sub>DP</sub>	PW≤10μs, duty cycle≤1%	14	-8	A
Allowable Power Dissipation	P <sub>D</sub>	Mounted on a ceramic board (900mm <sup>2</sup> ×0.8mm) 1unit	1.0		W
Total Dissipation	P <sub>T</sub>	Mounted on a ceramic board (900mm <sup>2</sup> ×0.8mm)	1.2		W
Channel Temperature	T <sub>ch</sub>		150		°C
Storage Temperature	T <sub>stg</sub>		-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 <sub>(BR)DSS</sub>	I <sub>D</sub> =1mA, V <sub>GS</sub> =0V	30			V
Zero-Gate Voltage Drain Current	I <sub>DSS</sub>	V <sub>DS</sub> =30V, V <sub>GS</sub> =0V			1	μA
Gate-to-Source Leakage Current	I <sub>GSS</sub>	V <sub>GS</sub> =±16V, V <sub>DS</sub> =0V			±10	μA
Cutoff Voltage	V <sub>GS(off)</sub>	V <sub>DS</sub> =10V, I <sub>D</sub> =1mA	1.2		2.6	V
Forward Transfer Admittance	y <sub>fs</sub>	V <sub>DS</sub> =10V, I <sub>D</sub> =2A	1.5	2.6		S
Static Drain-to-Source On-State Resistance	R <sub>DS(on)1</sub>	I <sub>D</sub> =2A, V <sub>GS</sub> =10V		53	69	mΩ
	R <sub>DS(on)2</sub>	I <sub>D</sub> =1A, V <sub>GS</sub> =4V		105	150	mΩ

Marking : FB

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# EMH2602

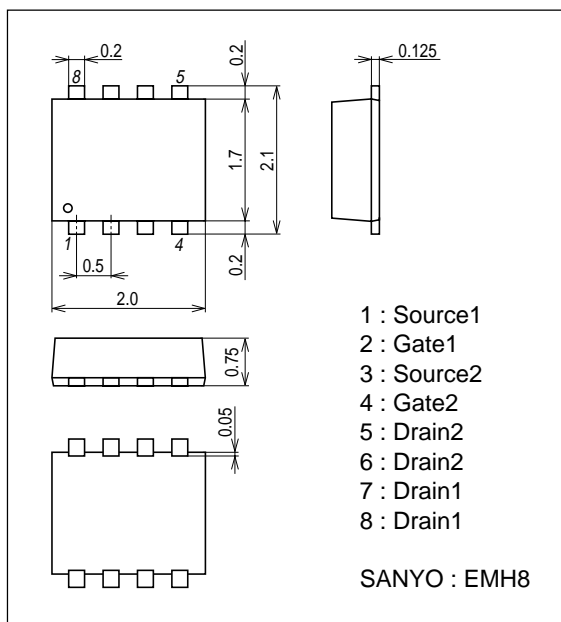
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Parameter	Symbol	Conditions	Ratings			Unit
			min	typ	max	
Input Capacitance	Ciss	V <sub>DS</sub> =10V, f=1MHz		280		pF
Output Capacitance	Coss	V <sub>DS</sub> =10V, f=1MHz		60		pF
Reverse Transfer Capacitance	Crss	V <sub>DS</sub> =10V, f=1MHz		47		pF
Turn-ON Delay Time	t <sub>d(on)</sub>	See specified Test Circuit.		8.6		ns
Rise Time	t <sub>r</sub>	See specified Test Circuit.		25.5		ns
Turn-OFF Delay Time	t <sub>d(off)</sub>	See specified Test Circuit.		23.0		ns
Fall Time	t <sub>f</sub>	See specified Test Circuit.		13.5		ns
Total Gate Charge	Q <sub>g</sub>	V <sub>DS</sub> =10V, V <sub>GS</sub> =10V, I <sub>D</sub> =3.5A		6.4		nC
Gate-to-Source Charge	Q <sub>gs</sub>	V <sub>DS</sub> =10V, V <sub>GS</sub> =10V, I <sub>D</sub> =3.5A		1.35		nC
Gate-to-Drain "Miller" Charge	Q <sub>gd</sub>	V <sub>DS</sub> =10V, V <sub>GS</sub> =10V, I <sub>D</sub> =3.5A		1.05		nC
Diode Forward Voltage	V <sub>SD</sub>	I <sub>S</sub> =3.5A, V <sub>GS</sub> =0V		0.85	1.2	V
[P-channel]						
Drain-to-Source Breakdown Voltage	V <sub>(BR)DSS</sub>	I <sub>D</sub> =-1mA, V <sub>GS</sub> =0V	-30			V
Zero-Gate Voltage Drain Current	I <sub>DSS</sub>	V <sub>DS</sub> =-30V, V <sub>GS</sub> =0V			-1	μA
Gate-to-Source Leakage Current	I <sub>GSS</sub>	V <sub>GS</sub> =±16V, V <sub>DS</sub> =0V			±10	μA
Cutoff Voltage	V <sub>GS(off)</sub>	V <sub>DS</sub> =-10V, I <sub>D</sub> =-1mA	-1.2		-2.6	V
Forward Transfer Admittance	y <sub>fs</sub>	V <sub>DS</sub> =-10V, I <sub>D</sub> =-1A	1.3	2.2		S
Static Drain-to-Source On-State Resistance	R <sub>DS(on)1</sub>	I <sub>D</sub> =-1A, V <sub>GS</sub> =-10V		115	150	mΩ
	R <sub>DS(on)2</sub>	I <sub>D</sub> =-0.5A, V <sub>GS</sub> =-4V		215	310	mΩ
Input Capacitance	Ciss	V <sub>DS</sub> =-10V, f=1MHz		285		pF
Output Capacitance	Coss	V <sub>DS</sub> =-10V, f=1MHz		65		pF
Reverse Transfer Capacitance	Crss	V <sub>DS</sub> =-10V, f=1MHz		52		pF
Turn-ON Delay Time	t <sub>d(on)</sub>	See specified Test Circuit.		8.4		ns
Rise Time	t <sub>r</sub>	See specified Test Circuit.		15.5		ns
Turn-OFF Delay Time	t <sub>d(off)</sub>	See specified Test Circuit.		29		ns
Fall Time	t <sub>f</sub>	See specified Test Circuit.		25.5		ns
Total Gate Charge	Q <sub>g</sub>	V <sub>DS</sub> =-10V, V <sub>GS</sub> =-10V, I <sub>D</sub> =-2A		6.7		nC
Gate-to-Source Charge	Q <sub>gs</sub>	V <sub>DS</sub> =-10V, V <sub>GS</sub> =-10V, I <sub>D</sub> =-2A		1.1		nC
Gate-to-Drain "Miller" Charge	Q <sub>gd</sub>	V <sub>DS</sub> =-10V, V <sub>GS</sub> =-10V, I <sub>D</sub> =-2A		1.05		nC
Diode Forward Voltage	V <sub>SD</sub>	I <sub>S</sub> =-2A, V <sub>GS</sub> =0V		-0.85	-1.2	V

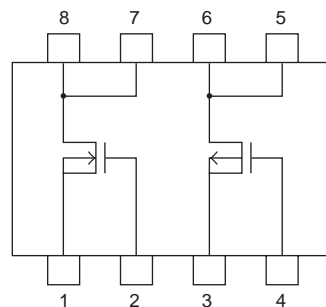
## Package Dimensions

unit : mm (typ)

7045-002



## Electrical Connection

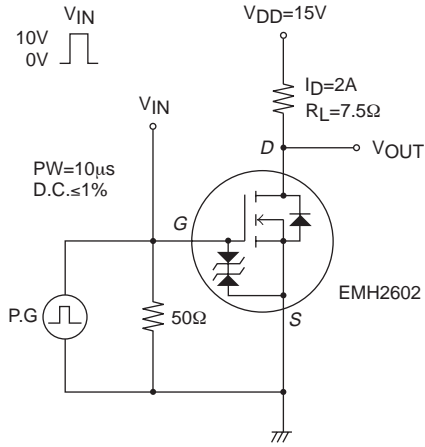


- 1 : Source1
- 2 : Gate1
- 3 : Source2
- 4 : Gate2
- 5 : Drain2
- 6 : Drain2
- 7 : Drain1
- 8 : Drain1

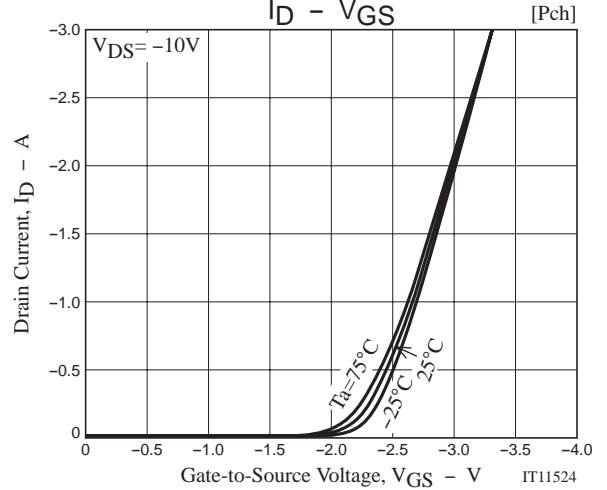
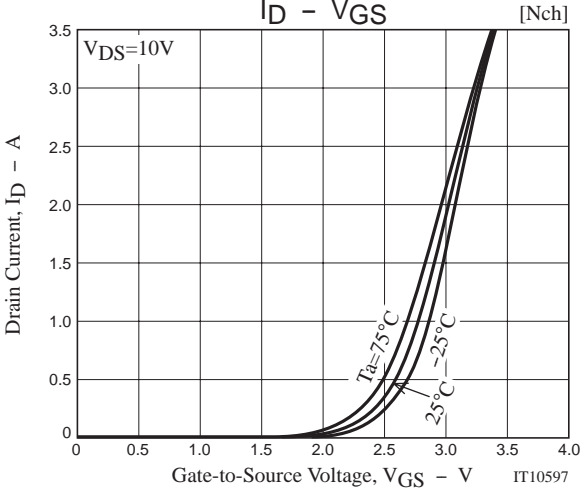
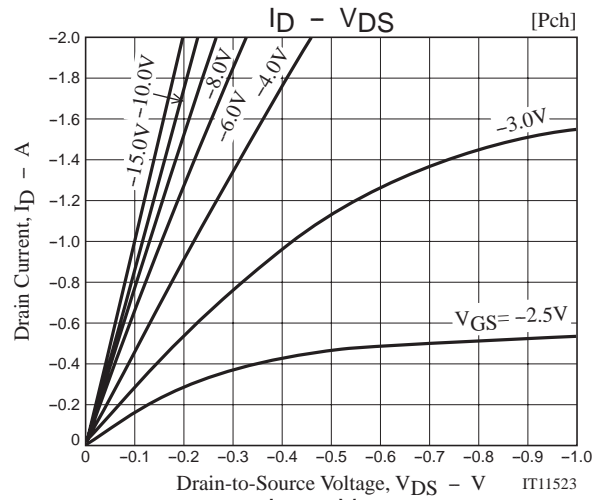
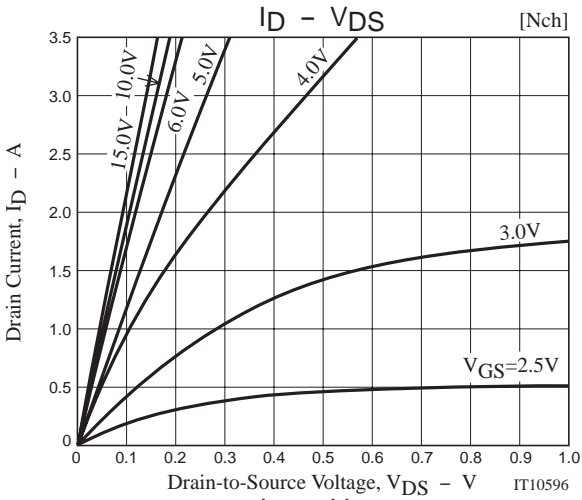
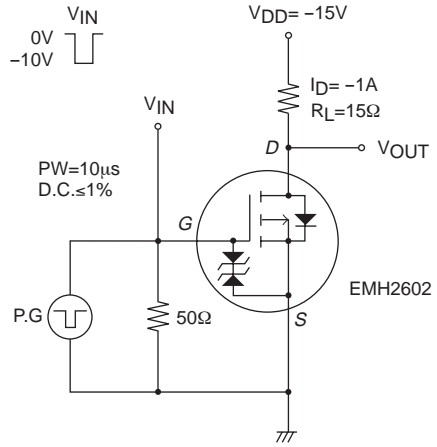
Top view

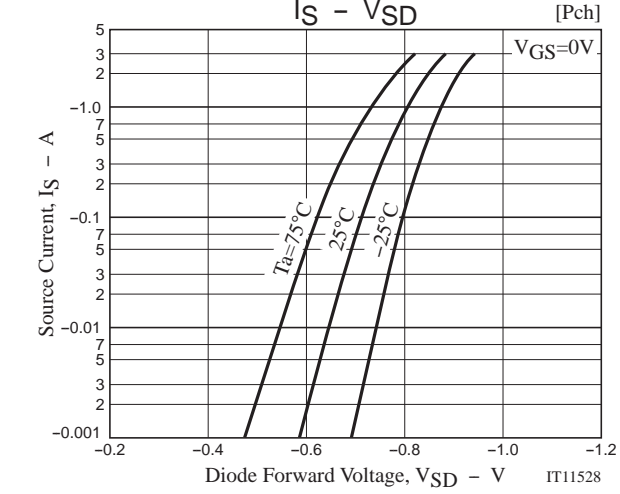
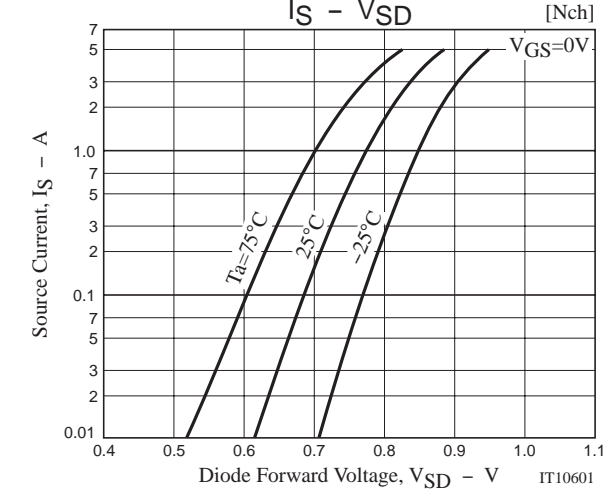
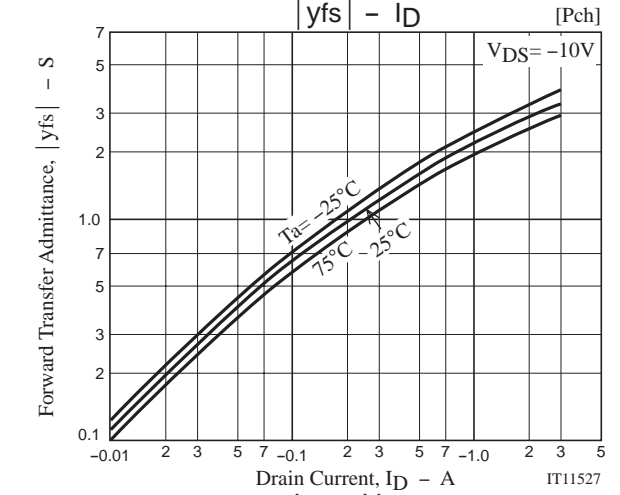
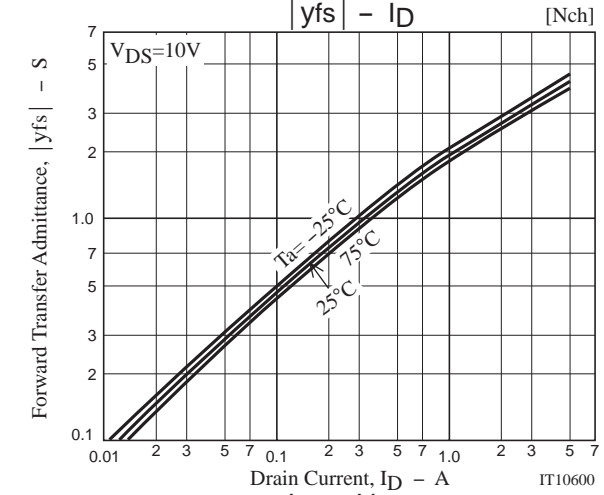
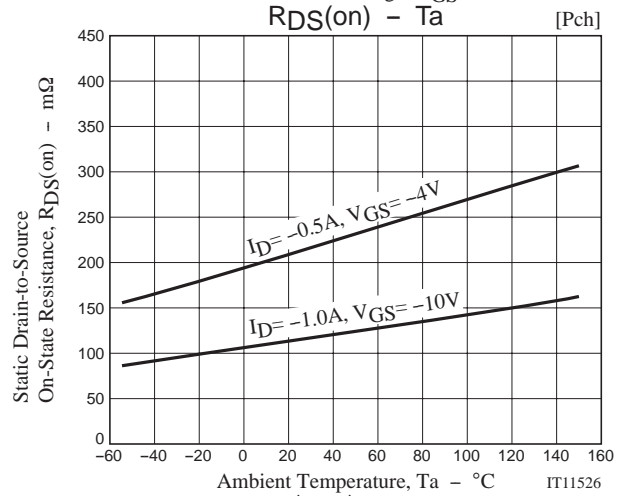
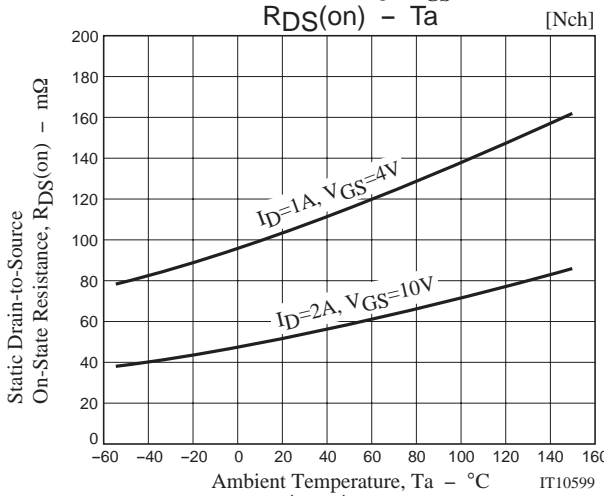
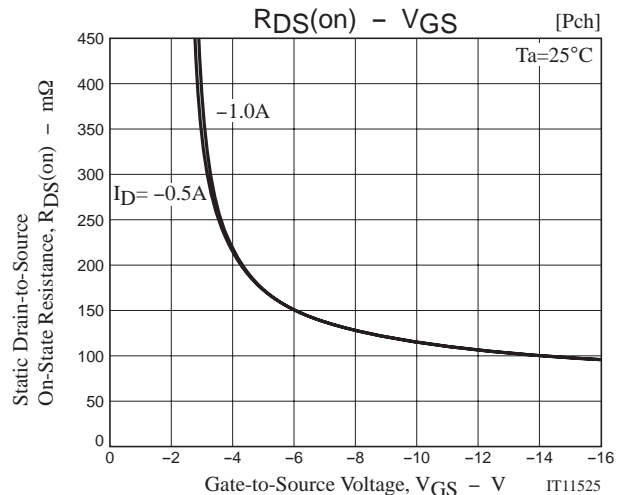
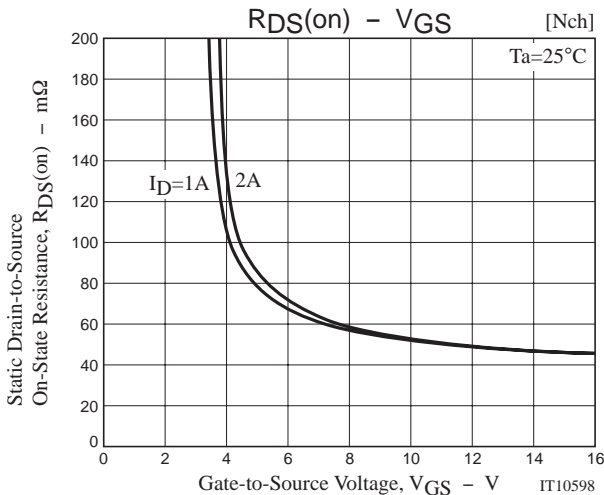
Switching Time Test Circuit

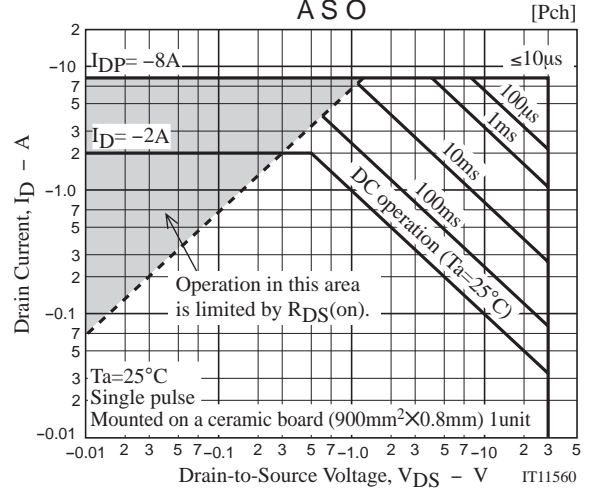
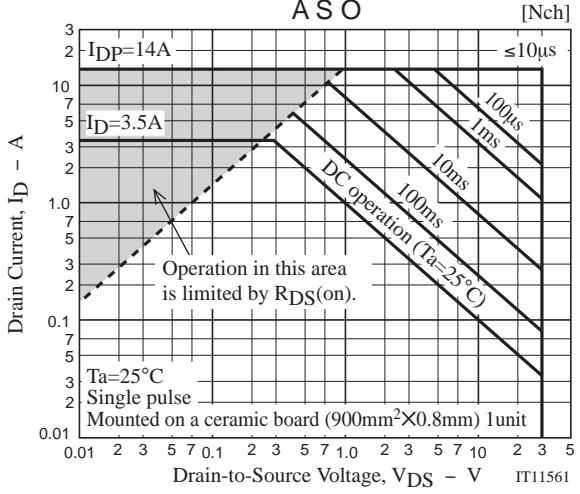
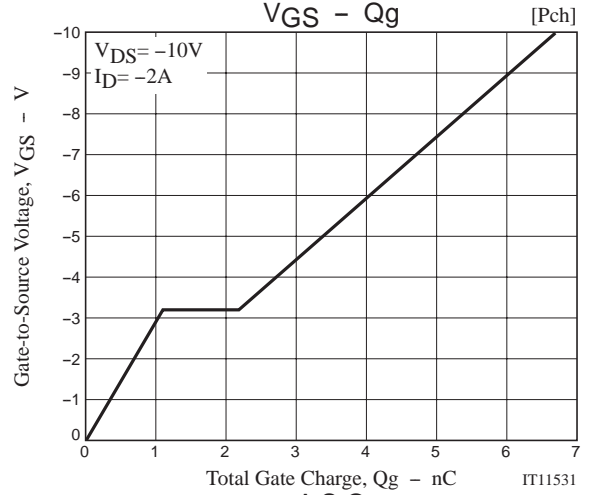
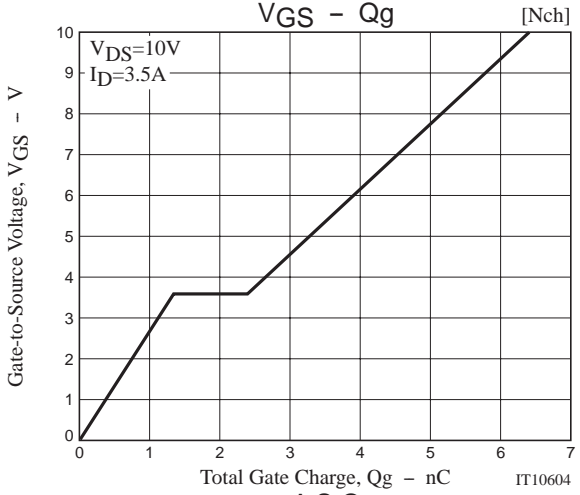
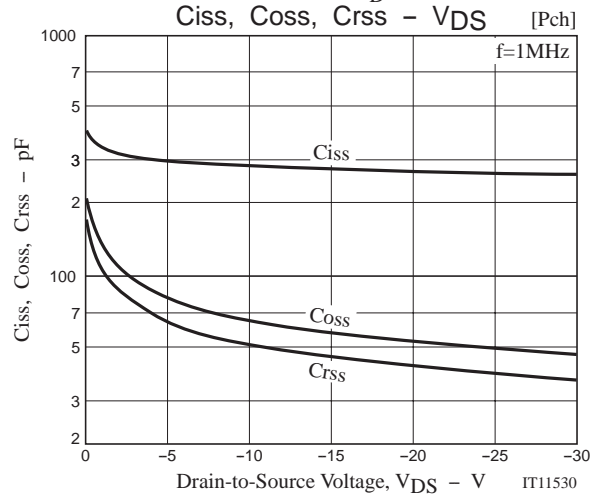
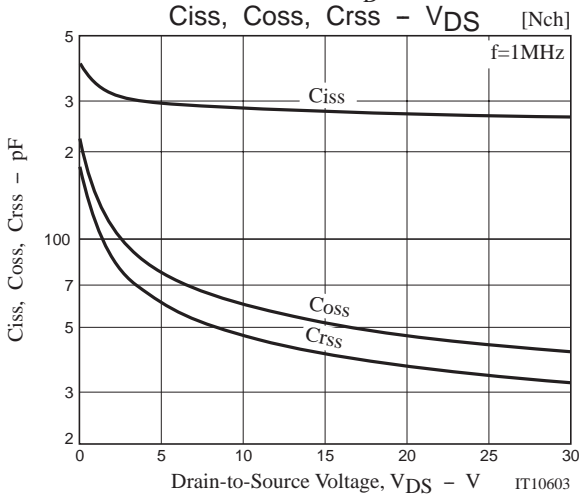
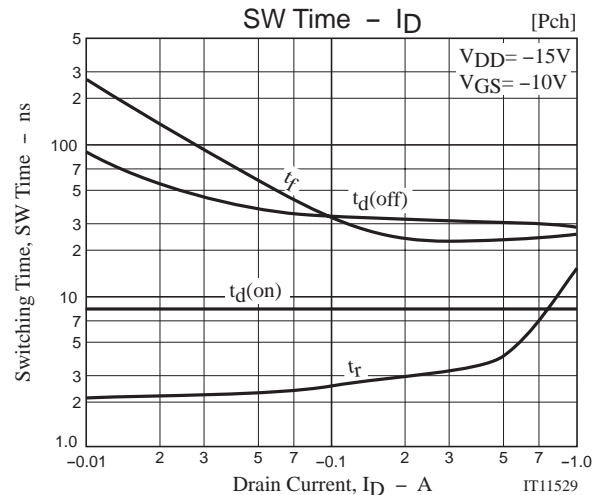
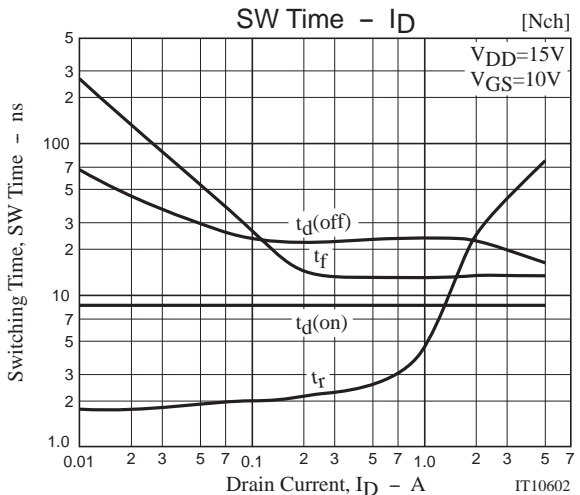
[N-channel]

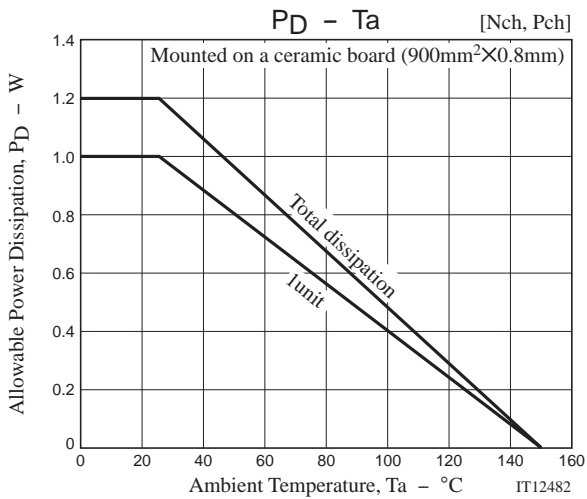


[P-channel]









Note on usage : Since the EMH2602 is a MOSFET product, please avoid using this device in the vicinity of highly charged objects.

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