



EMH2604 — General-Purpose Switching Device Applications

N-Channel and P-Channel Silicon MOSFETs

Features

- Nch + Pch MOSFET
- ON-resistance Nch : $R_{DS(on)1}=34m\Omega(\text{typ.})$
Pch : $R_{DS(on)1}=65m\Omega(\text{typ.})$
- 1.8V drive
- Halogen free compliance

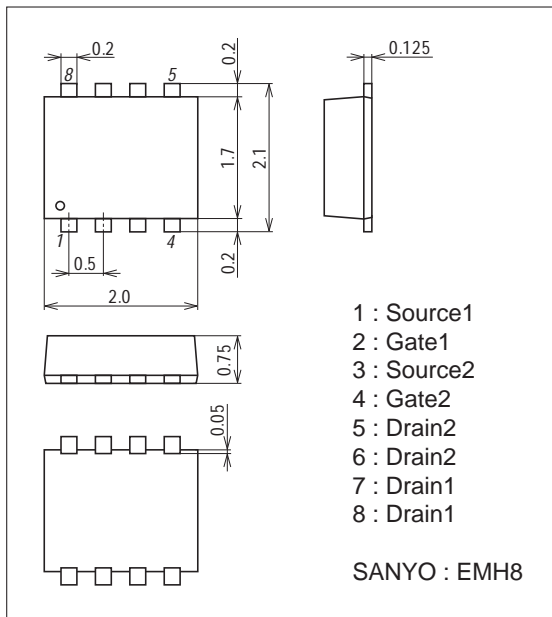
Specifications

Absolute Maximum Ratings at $T_a=25^\circ\text{C}$

Parameter	Symbol	Conditions	N-channel	P-channel	Unit
Drain-to-Source Voltage	V_{DSS}		20	-20	V
Gate-to-Source Voltage	V_{GSS}		± 10	± 10	V
Drain Current (DC)	I_D		4	-3	A
Drain Current (Pulse)	I_{DP}	$PW \leq 10\mu\text{s}$, duty cycle $\leq 1\%$	20	-20	A
Allowable Power Dissipation	P_D	When mounted on ceramic substrate (900mm ² ×0.8mm) 1unit	1.0		W
Total Dissipation	P_T	When mounted on ceramic substrate (900mm ² ×0.8mm)	1.2		W
Channel Temperature	T_{ch}		150		°C
Storage Temperature	T_{stg}		-55 to +150		°C

Package Dimensions

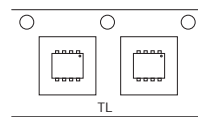
unit : mm (typ)
7045-002



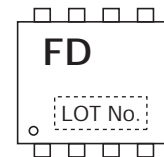
Product & Package Information

- Package : EMH8
- JEITA, JEDEC : -
- Minimum Packing Quantity : 3,000 pcs./reel

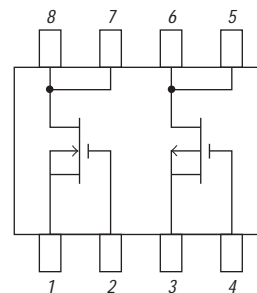
Packing Type : TL



Marking



Electrical Connection



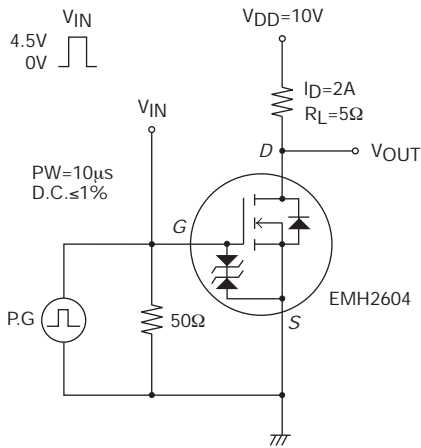
EMH2604

Electrical Characteristics at Ta=25°C

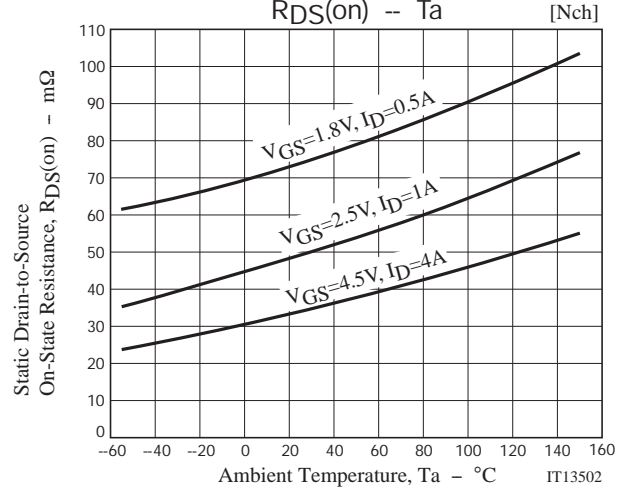
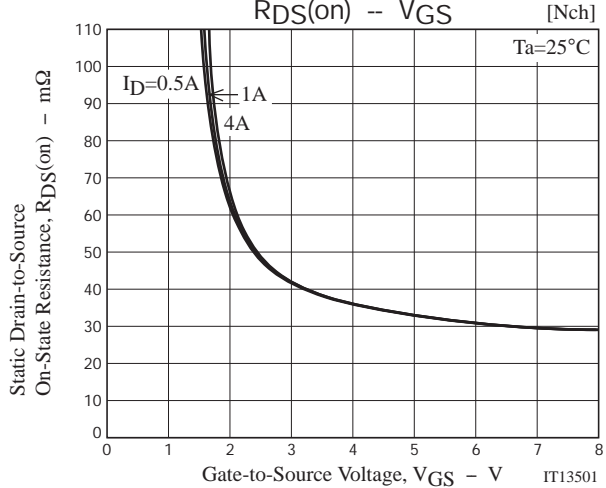
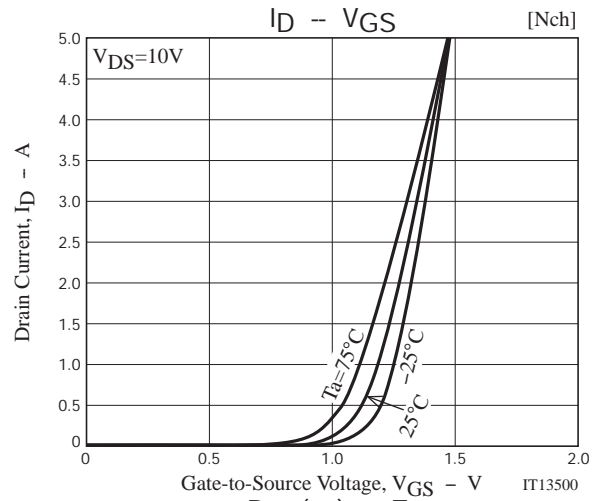
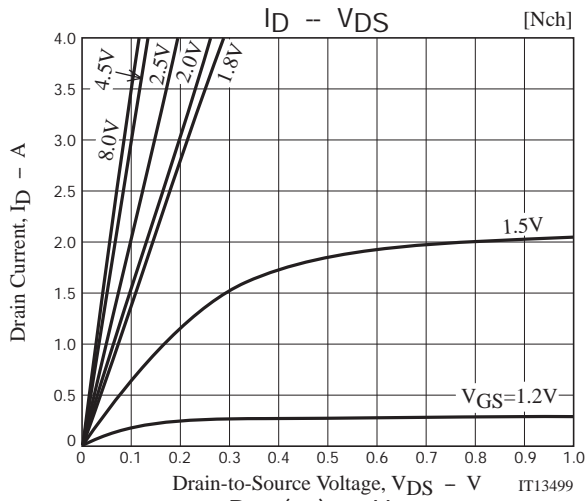
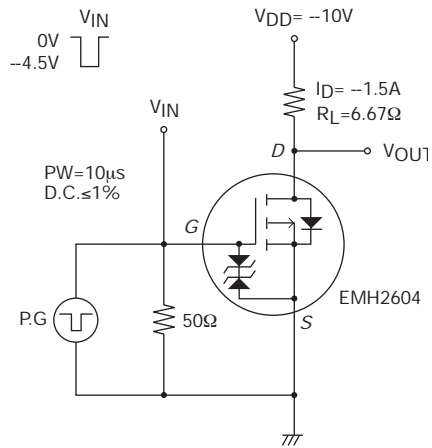
Parameter	Symbol	Conditions	Ratings			Unit
			min	typ	max	
[N-channel]						
Drain-to-Source Breakdown Voltage	$V_{(BR)DSS}$	$I_D=1mA, V_{GS}=0V$	20			V
Zero-Gate Voltage Drain Current	I_{DSS}	$V_{DS}=20V, V_{GS}=0V$			1	μA
Gate-to-Source Leakage Current	I_{GSS}	$V_{GS}=\pm 8V, V_{DS}=0V$			± 10	μA
Cutoff Voltage	$V_{GS(off)}$	$V_{DS}=10V, I_D=1mA$	0.4		1.3	V
Forward Transfer Admittance	$ y_{fs} $	$V_{DS}=10V, I_D=2A$		3.4		S
Static Drain-to-Source On-State Resistance	$R_{DS(on)1}$	$I_D=4A, V_{GS}=4.5V$		34	45	$m\Omega$
	$R_{DS(on)2}$	$I_D=1A, V_{GS}=2.5V$		49	67	$m\Omega$
	$R_{DS(on)3}$	$I_D=0.5A, V_{GS}=1.8V$		74	115	$m\Omega$
Input Capacitance	C_{iss}	$V_{DS}=10V, f=1MHz$		345		pF
Output Capacitance	C_{oss}	$V_{DS}=10V, f=1MHz$		67		pF
Reverse Transfer Capacitance	C_{rss}	$V_{DS}=10V, f=1MHz$		52		pF
Turn-ON Delay Time	$t_d(on)$	See specified Test Circuit.		9.2		ns
Rise Time	t_r	See specified Test Circuit.		60		ns
Turn-OFF Delay Time	$t_d(off)$	See specified Test Circuit.		30		ns
Fall Time	t_f	See specified Test Circuit.		38		ns
Total Gate Charge	Q_g	$V_{DS}=10V, V_{GS}=4.5V, I_D=4A$		4.7		nC
Gate-to-Source Charge	Q_{gs}	$V_{DS}=10V, V_{GS}=4.5V, I_D=4A$		0.65		nC
Gate-to-Drain "Miller" Charge	Q_{gd}	$V_{DS}=10V, V_{GS}=4.5V, I_D=4A$		1.6		nC
Diode Forward Voltage	V_{SD}	$I_S=4A, V_{GS}=0V$		0.8	1.2	V
[P-channel]						
Drain-to-Source Breakdown Voltage	$V_{(BR)DSS}$	$I_D=-1mA, V_{GS}=0V$	-20			V
Zero-Gate Voltage Drain Current	I_{DSS}	$V_{DS}=-20V, V_{GS}=0V$			-1	μA
Gate-to-Source Leakage Current	I_{GSS}	$V_{GS}=\pm 8V, V_{DS}=0V$			± 10	μA
Cutoff Voltage	$V_{GS(off)}$	$V_{DS}=-10V, I_D=-1mA$	-0.4		-1.3	V
Forward Transfer Admittance	$ y_{fs} $	$V_{DS}=-10V, I_D=-1.5A$		3.6		S
Static Drain-to-Source On-State Resistance	$R_{DS(on)1}$	$I_D=-3A, V_{GS}=-4.5V$		65	85	$m\Omega$
	$R_{DS(on)2}$	$I_D=-1A, V_{GS}=-2.5V$		98	137	$m\Omega$
	$R_{DS(on)3}$	$I_D=-0.5A, V_{GS}=-1.8V$		155	235	$m\Omega$
Input Capacitance	C_{iss}	$V_{DS}=-10V, f=1MHz$		320		pF
Output Capacitance	C_{oss}	$V_{DS}=-10V, f=1MHz$		66		pF
Reverse Transfer Capacitance	C_{rss}	$V_{DS}=-10V, f=1MHz$		50		pF
Turn-ON Delay Time	$t_d(on)$	See specified Test Circuit.		7.1		ns
Rise Time	t_r	See specified Test Circuit.		21		ns
Turn-OFF Delay Time	$t_d(off)$	See specified Test Circuit.		37		ns
Fall Time	t_f	See specified Test Circuit.		32		ns
Total Gate Charge	Q_g	$V_{DS}=-10V, V_{GS}=-4.5V, I_D=-3A$		4.0		nC
Gate-to-Source Charge	Q_{gs}	$V_{DS}=-10V, V_{GS}=-4.5V, I_D=-3A$		0.6		nC
Gate-to-Drain "Miller" Charge	Q_{gd}	$V_{DS}=-10V, V_{GS}=-4.5V, I_D=-3A$		1.1		nC
Diode Forward Voltage	V_{SD}	$I_S=-3A, V_{GS}=0V$		-0.83	-1.2	V

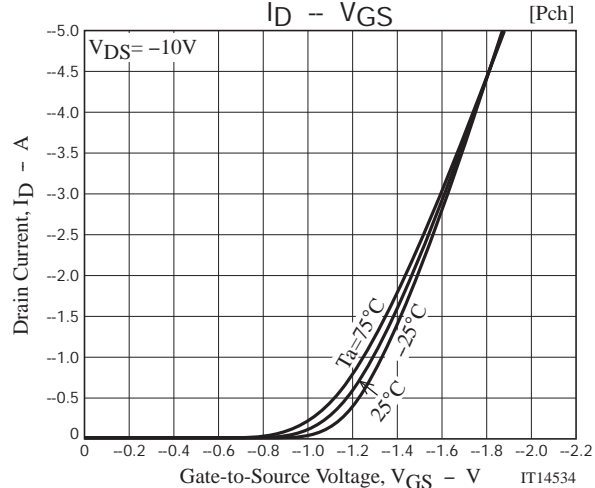
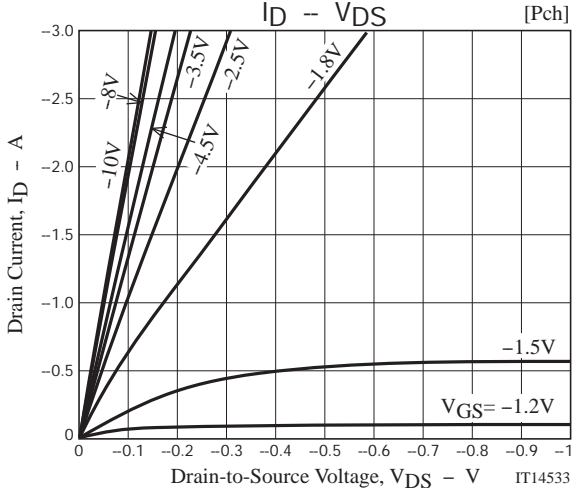
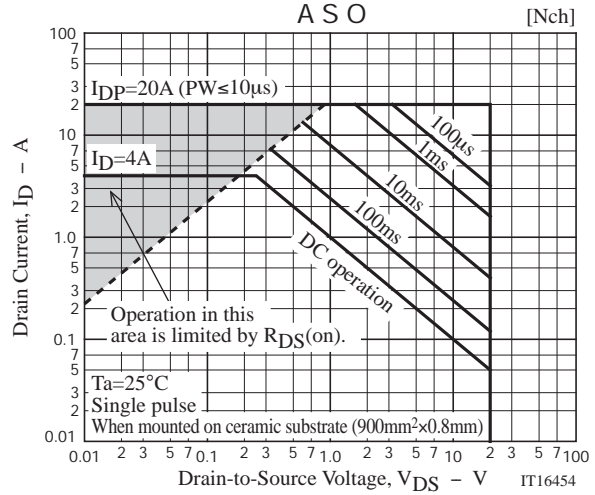
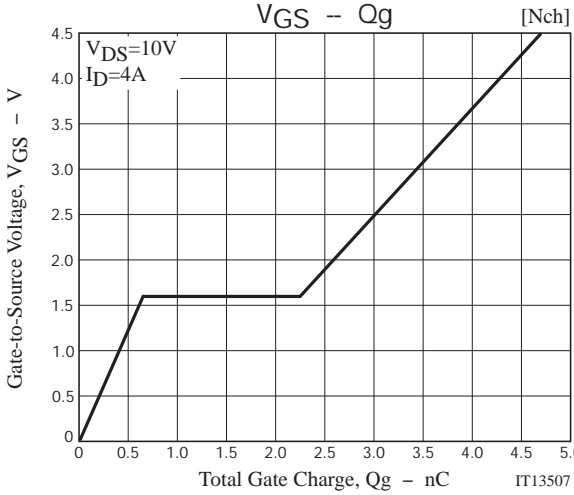
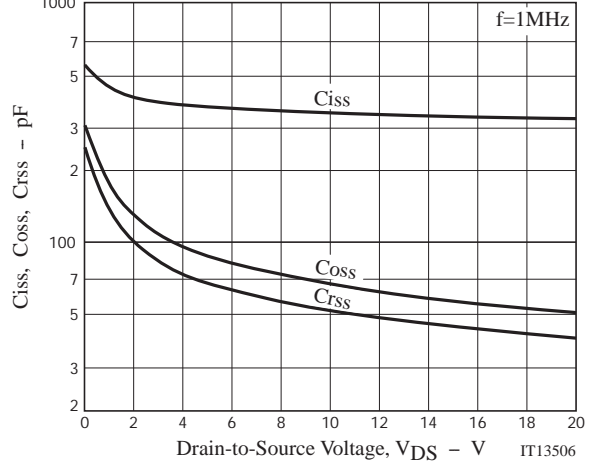
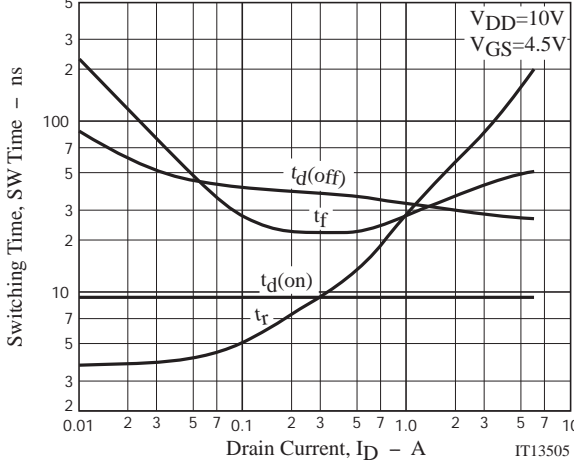
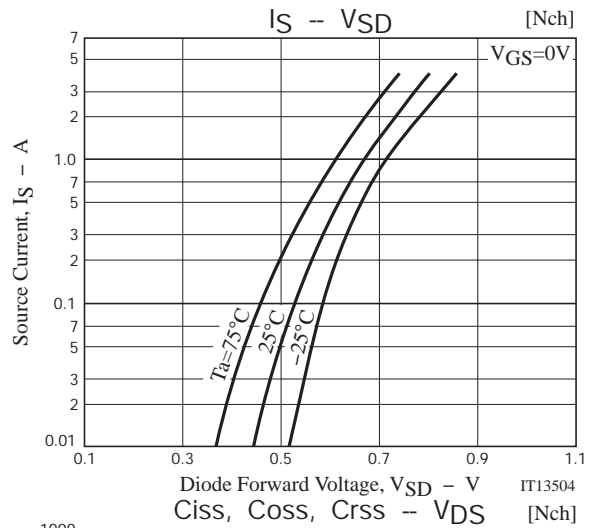
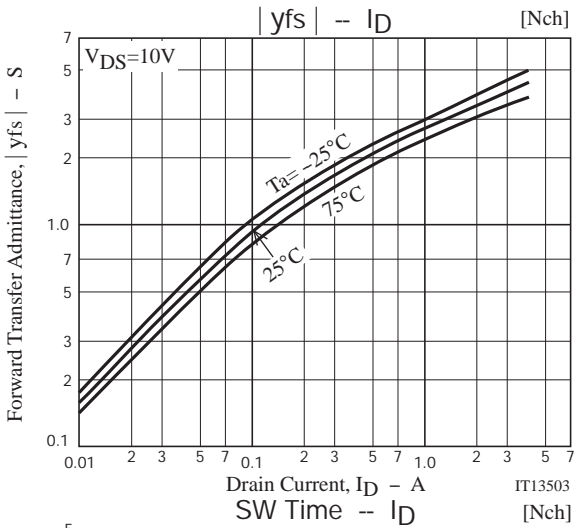
Switching Time Test Circuit

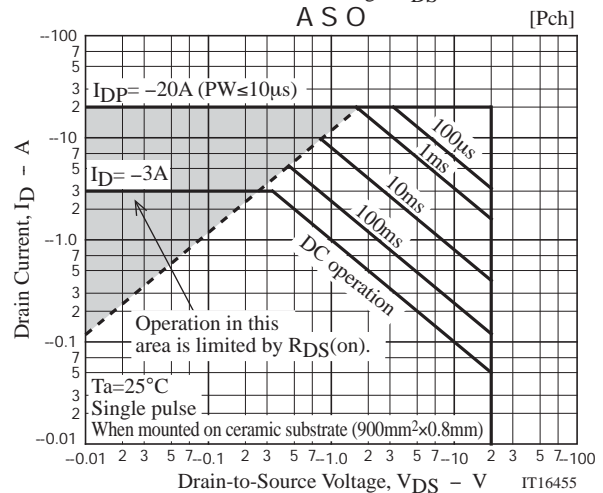
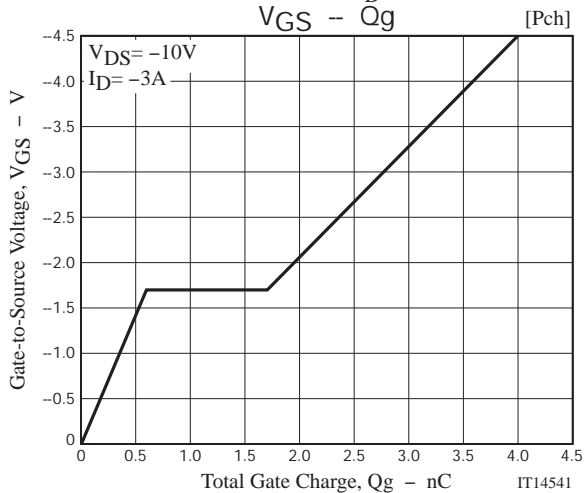
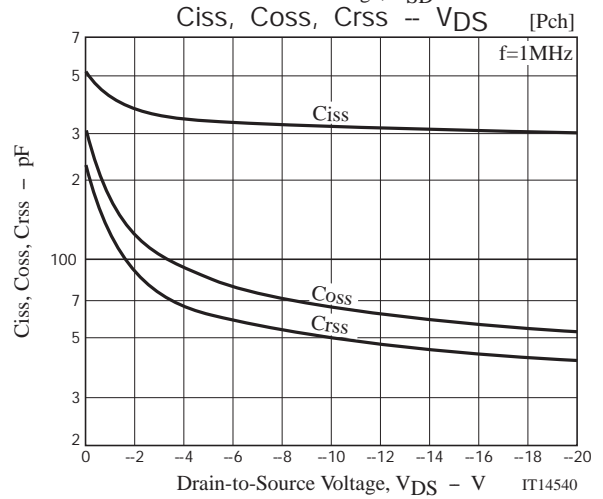
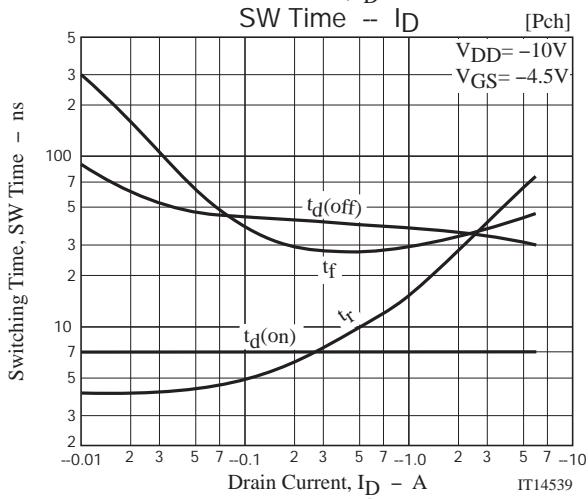
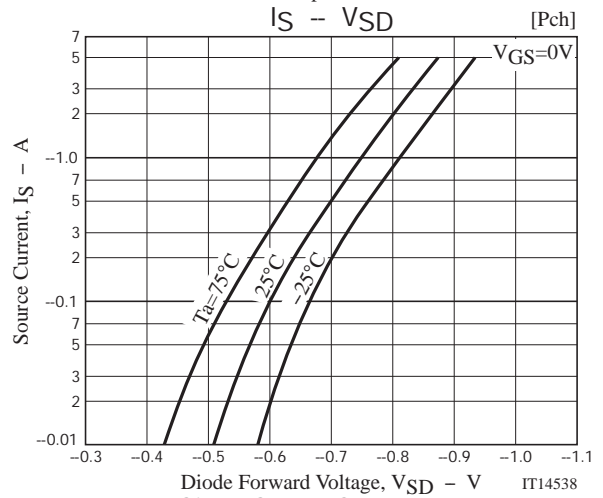
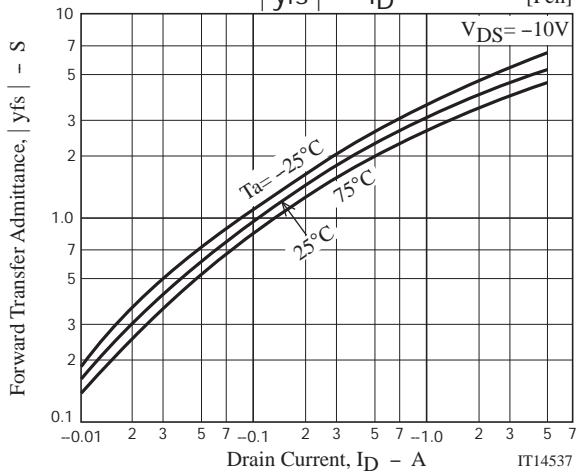
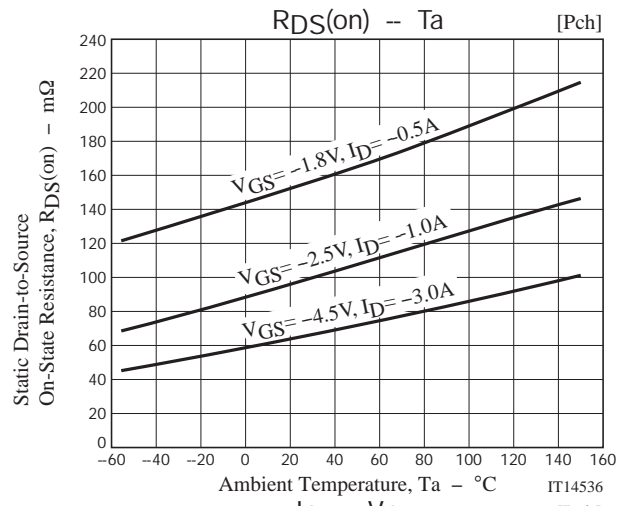
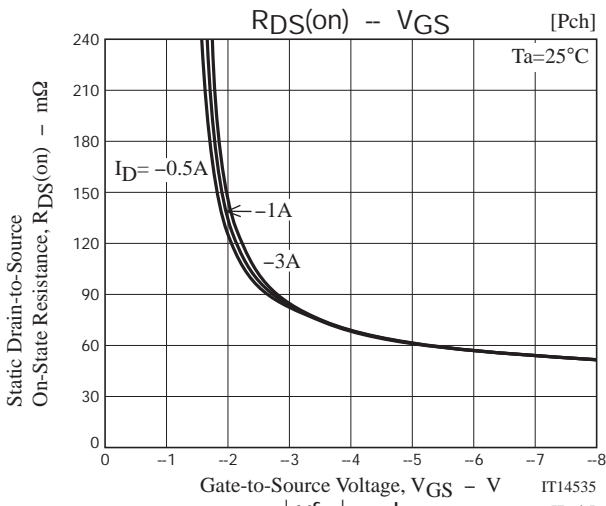
[N-channel]

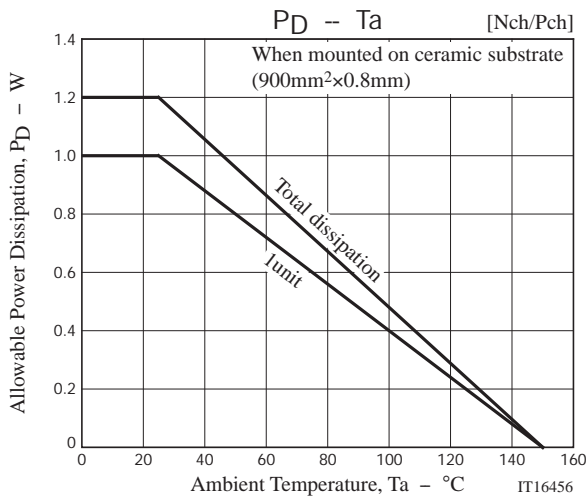


[P-channel]









Note on usage : Since the EMH2604 is a MOSFET product, please avoid using this device in the vicinity of highly charged objects.

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