



SANYO Semiconductors

DATA SHEET

An ON Semiconductor Company

N-Channel and P-Channel Silicon MOSFETs

EMH2604 — General-Purpose Switching Device Applications

Features

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

Specifications

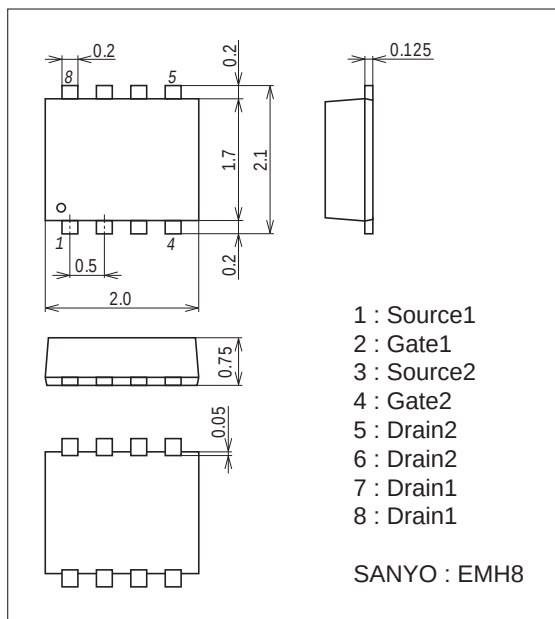
Absolute Maximum Ratings at $T_a=25^\circ\text{C}$

Parameter	Symbol	Conditions	N-channel	P-channel	Unit
Drain-to-Source Voltage	V_{DS}		20	-20	V
Gate-to-Source Voltage	V_{GS}		± 10	± 10	V
Drain Current (DC)	I_D		4	-3	A
Drain Current (Pulse)	I_{DP}	$PW \leq 10\mu s$, 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)

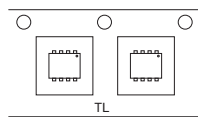
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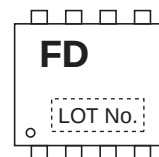
Product & Package Information

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

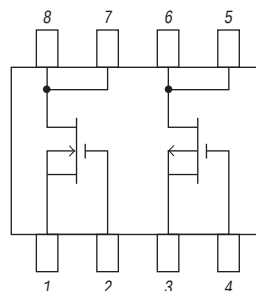
Packing Type : TL



Marking



Electrical Connection



SANYO Semiconductor Co., Ltd.

<http://semicon.sanyo.com/en/network>

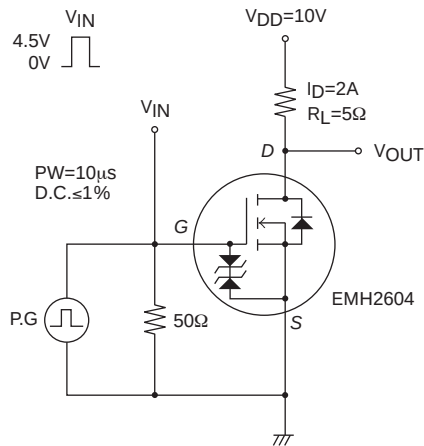
EMH2604

Electrical Characteristics at Ta=25°C

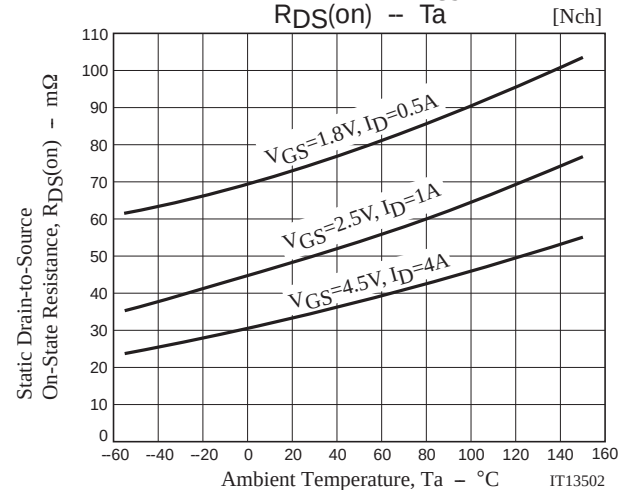
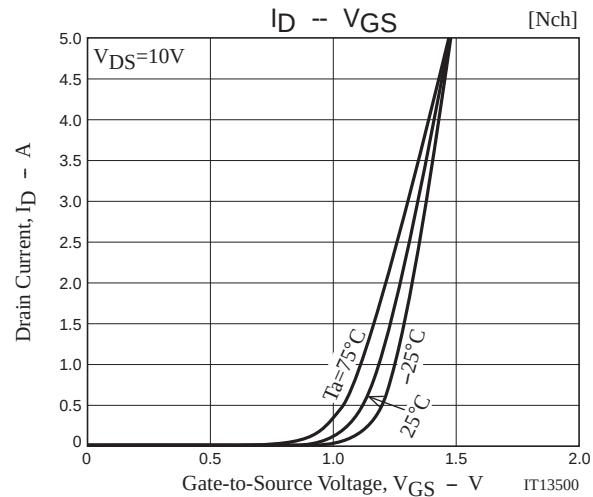
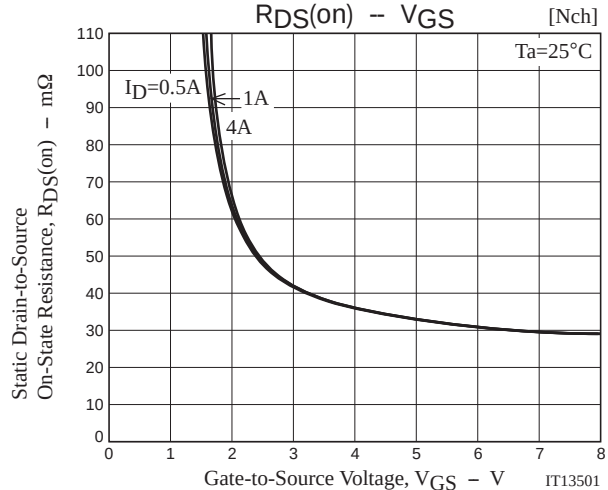
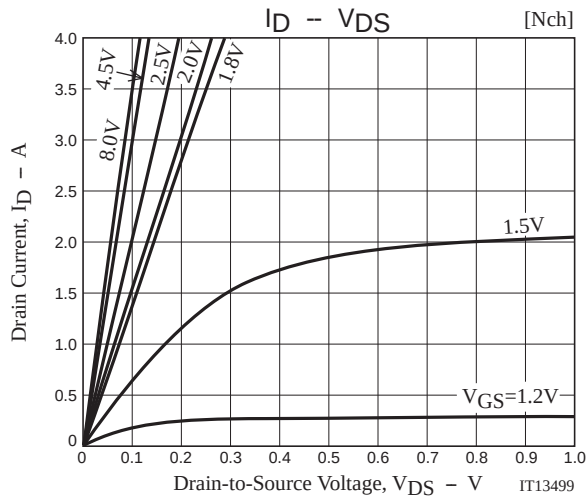
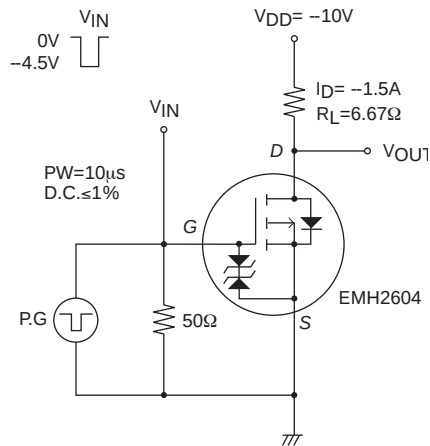
Parameter	Symbol	Conditions	Ratings			Unit
			min	typ	max	
[N-channel]						
Drain-to-Source Breakdown Voltage	V(BR)DSS	ID=1mA, VGS=0V	20			V
Zero-Gate Voltage Drain Current	IDSS	VDS=20V, VGS=0V			1	μA
Gate-to-Source Leakage Current	IGSS	VGS=±8V, VDS=0V			±10	μA
Cutoff Voltage	VGS(off)	VDS=10V, ID=1mA	0.4		1.3	V
Forward Transfer Admittance	yfs	VDS=10V, ID=2A		3.4		S
Static Drain-to-Source On-State Resistance	RDS(on)1	ID=4A, VGS=4.5V		34	45	mΩ
	RDS(on)2	ID=1A, VGS=2.5V		49	67	mΩ
	RDS(on)3	ID=0.5A, VGS=1.8V		74	115	mΩ
Input Capacitance	Ciss	VDS=10V, f=1MHz		345		pF
Output Capacitance	Coss	VDS=10V, f=1MHz		67		pF
Reverse Transfer Capacitance	Crss	VDS=10V, f=1MHz		52		pF
Turn-ON Delay Time	td(on)	See specified Test Circuit.		9.2		ns
Rise Time	tr	See specified Test Circuit.		60		ns
Turn-OFF Delay Time	td(off)	See specified Test Circuit.		30		ns
Fall Time	tf	See specified Test Circuit.		38		ns
Total Gate Charge	Qg	VDS=10V, VGS=4.5V, ID=4A		4.7		nC
Gate-to-Source Charge	Qgs	VDS=10V, VGS=4.5V, ID=4A		0.65		nC
Gate-to-Drain “Miller” Charge	Qgd	VDS=10V, VGS=4.5V, ID=4A		1.6		nC
Diode Forward Voltage	VSD	IS=4A, VGS=0V		0.8	1.2	V
[P-channel]						
Drain-to-Source Breakdown Voltage	V(BR)DSS	ID=-1mA, VGS=0V	-20			V
Zero-Gate Voltage Drain Current	IDSS	VDS=-20V, VGS=0V			-1	μA
Gate-to-Source Leakage Current	IGSS	VGS=±8V, VDS=0V			±10	μA
Cutoff Voltage	VGS(off)	VDS=-10V, ID=-1mA	-0.4		-1.3	V
Forward Transfer Admittance	yfs	VDS=-10V, ID=-1.5A		3.6		S
Static Drain-to-Source On-State Resistance	RDS(on)1	ID=-3A, VGS=-4.5V		65	85	mΩ
	RDS(on)2	ID=-1A, VGS=-2.5V		98	137	mΩ
	RDS(on)3	ID=-0.5A, VGS=-1.8V		155	235	mΩ
Input Capacitance	Ciss	VDS=-10V, f=1MHz		320		pF
Output Capacitance	Coss	VDS=-10V, f=1MHz		66		pF
Reverse Transfer Capacitance	Crss	VDS=-10V, f=1MHz		50		pF
Turn-ON Delay Time	td(on)	See specified Test Circuit.		7.1		ns
Rise Time	tr	See specified Test Circuit.		21		ns
Turn-OFF Delay Time	td(off)	See specified Test Circuit.		37		ns
Fall Time	tf	See specified Test Circuit.		32		ns
Total Gate Charge	Qg	VDS=-10V, VGS=-4.5V, ID=-3A		4.0		nC
Gate-to-Source Charge	Qgs	VDS=-10V, VGS=-4.5V, ID=-3A		0.6		nC
Gate-to-Drain “Miller” Charge	Qgd	VDS=-10V, VGS=-4.5V, ID=-3A		1.1		nC
Diode Forward Voltage	VSD	IS=-3A, VGS=0V		-0.83	-1.2	V

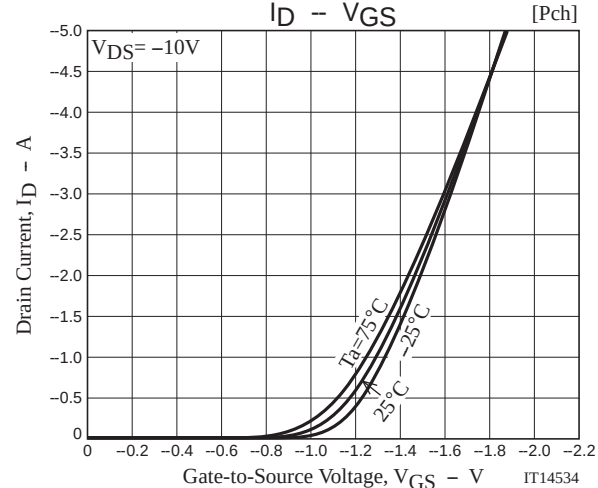
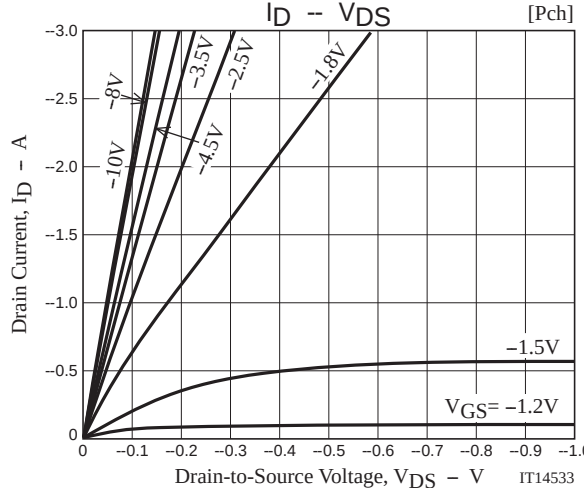
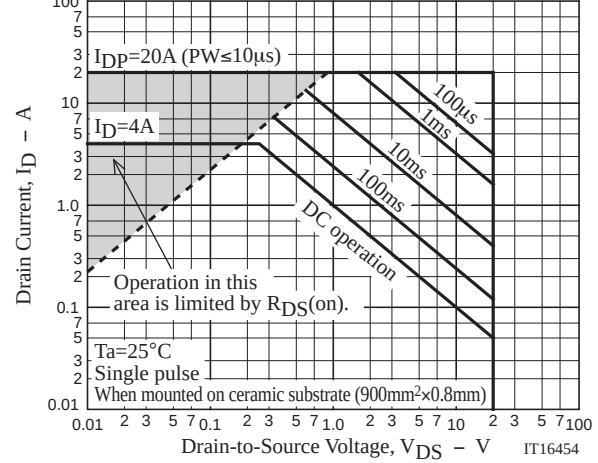
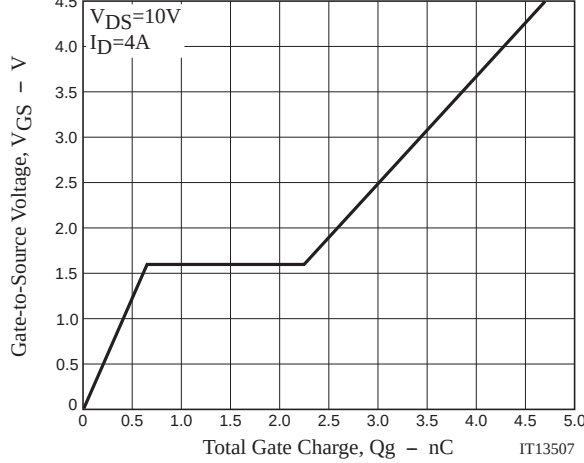
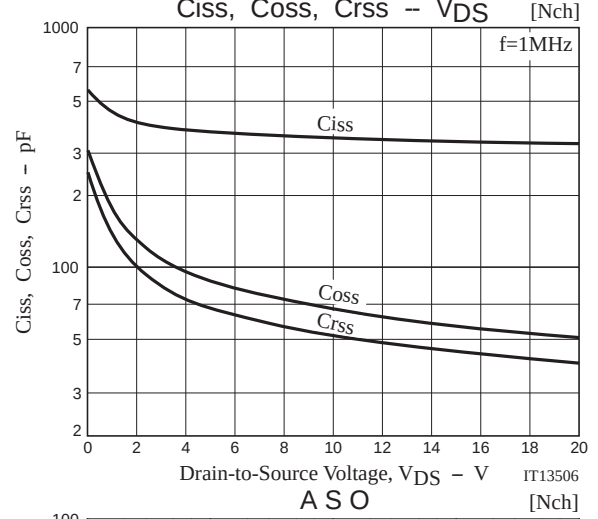
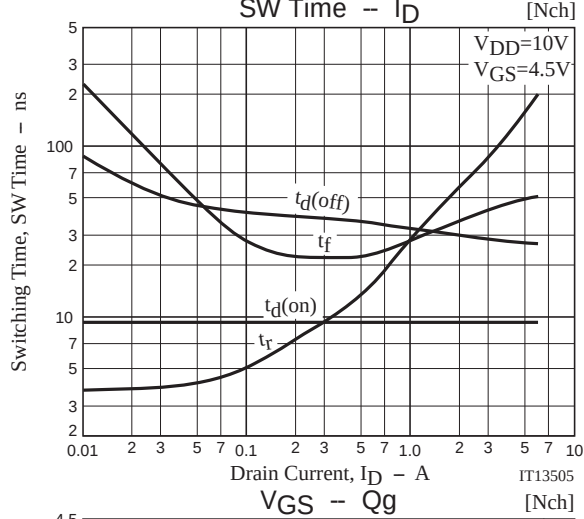
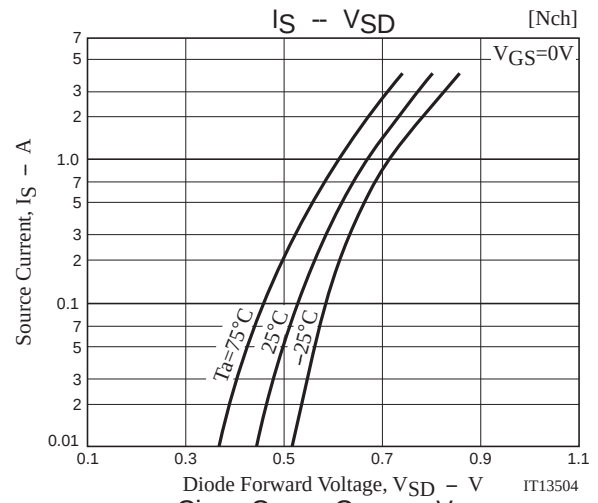
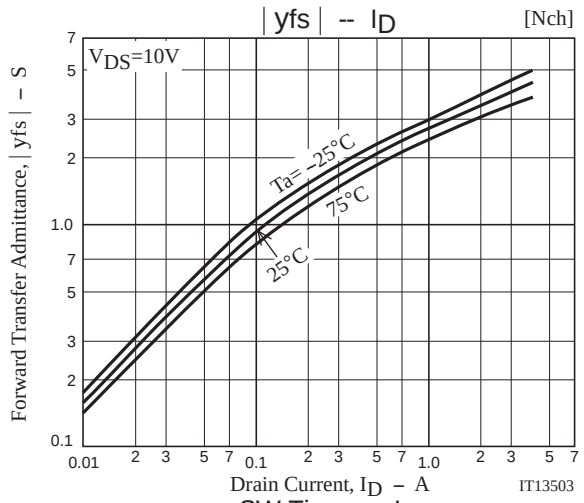
Switching Time Test Circuit

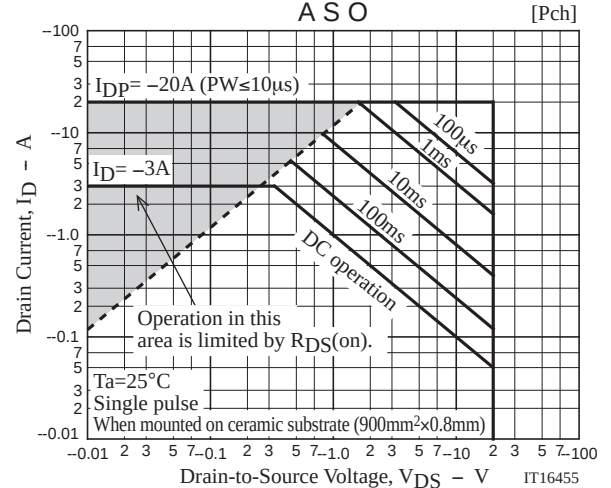
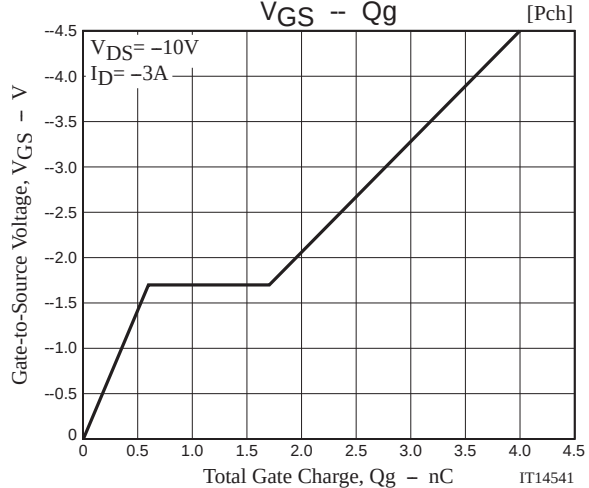
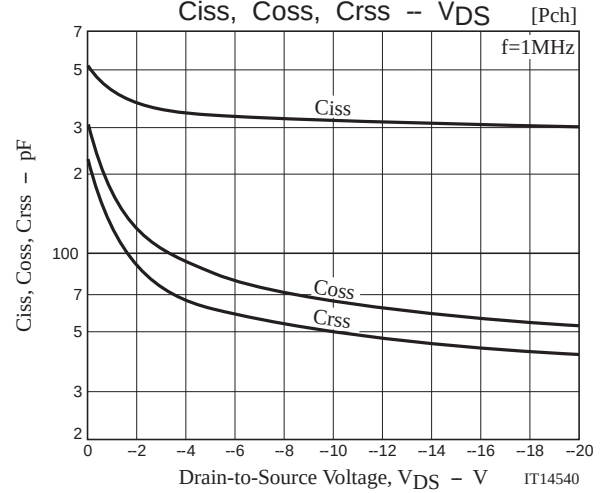
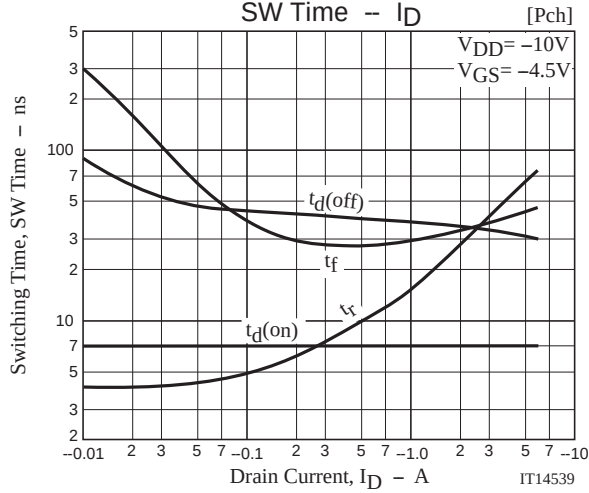
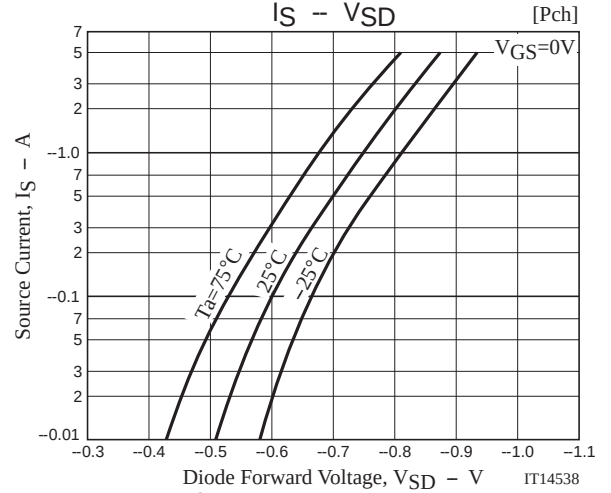
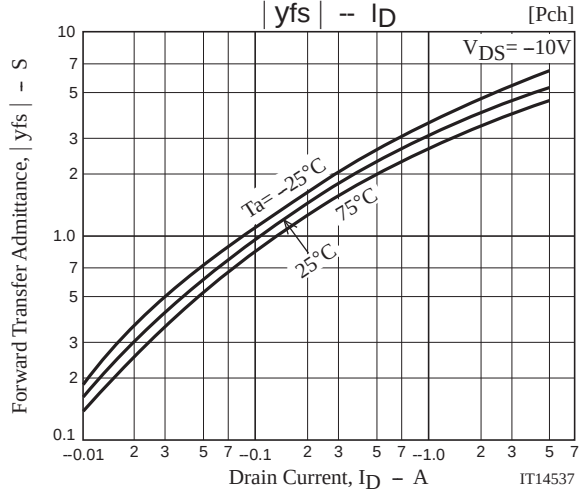
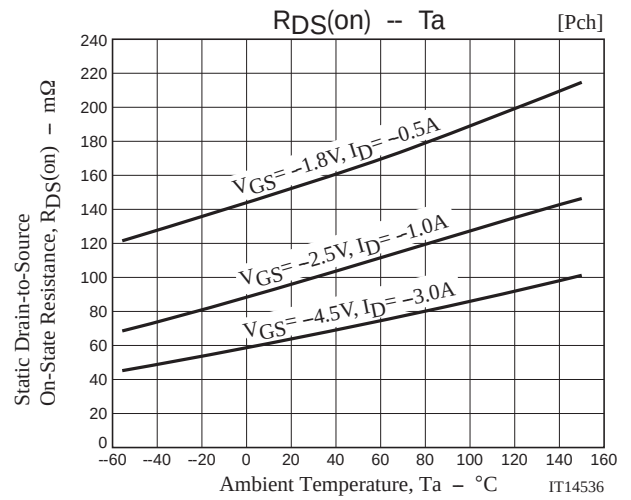
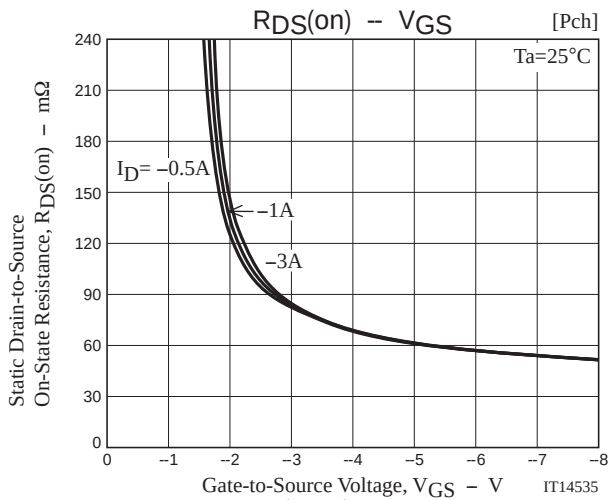
[N-channel]

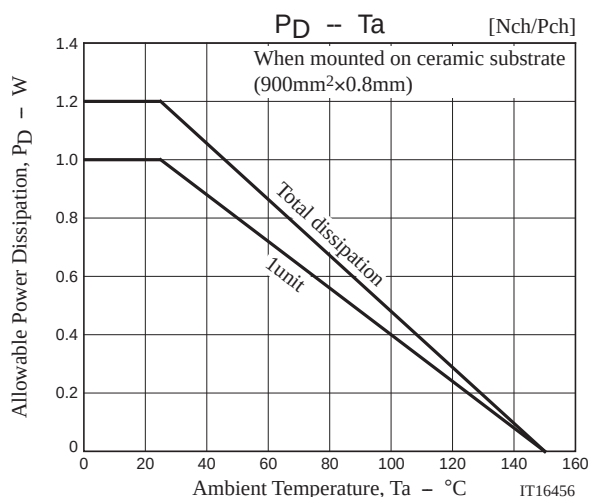


[P-channel]









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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