



FW389

Power MOSFET

100V, 2A, 225mΩ, -100V, -2A, 300mΩ, Complementary Dual SOIC8

ON Semiconductor®
<http://onsemi.com>

Features

- ON-resistance Nch : $R_{DS(on)1}=165m\Omega$ (typ.)
Pch : $R_{DS(on)1}=230m\Omega$ (typ.)
- Input Capacitance Nch : $C_{iss}=490pF$ (typ.)
Pch : $C_{iss}=1000pF$ (typ.)
- 4V drive
- Halogen free compliance
- Protection diode in

Specifications

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

Parameter	Symbol	Conditions	N-channel	P-channel	Unit
Drain-to-Source Voltage	V_{DSS}		100	-100	V
Gate-to-Source Voltage	V_{GSS}		± 20	± 20	V
Drain Current (DC)	I_D		2	-2	A
Drain Current ($PW \leq 100ms$)	I_{DP}	Duty cycle $\leq 1\%$	5	-5	A
Drain Current ($PW \leq 10\mu s$)	I_{DP}	Duty cycle $\leq 1\%$	8	-8	A
Allowable Power Dissipation	P_D	When mounted on ceramic substrate ($2000mm^2 \times 0.8mm$) 1unit, ($PW \leq 10s$)	1.8		W
Total Dissipation	P_T	When mounted on ceramic substrate ($2000mm^2 \times 0.8mm$), ($PW \leq 10s$)	2.2		W
Channel Temperature	T_{ch}		150		$^\circ C$
Storage Temperature	T_{stg}		-55 to +150		$^\circ C$
Avalanche Energy (Single Pulse) *1	E_{AS}		5.3	5.3	mJ
Avalanche Current *2	I_{AV}		2	-2	A

*1 N-Channel: $V_{DD}=10V$, $L=2mH$, $I_{AV}=2A$ (Fig.1)

P-Channel: $V_{DD}=-10V$, $L=2mH$, $I_{AV}=-2A$ (Fig.1)

*2 $L \leq 2mH$, single pulse

Stresses exceeding Maximum Ratings may damage the device. Maximum Ratings are stress ratings only. Functional operation above the Recommended Operating Conditions is not implied. Extended exposure to stresses above the Recommended Operating Conditions may affect device reliability.

Electrical Characteristics

 at $T_a=25^\circ C$

Parameter	Symbol	Conditions	Ratings			Unit
			min	typ	max	
[N-channel]						
Drain-to-Source Breakdown Voltage	V(BR)DSS	ID=1mA, VGS=0V	100			V
Zero-Gate Voltage Drain Current	IDSS	VDS=100V, VGS=0V			1	μA
Gate-to-Source Leakage Current	IGSS	VGS=±16V, VDS=0V			±10	μA
Cutoff Voltage	VGS(off)	VDS=10V, ID=1mA	1.5		2.6	V
Forward Transfer Admittance	yfs	VDS=10V, ID=2A		2.9		S
Static Drain-to-Source On-State Resistance	RDS(on)1	ID=2A, VGS=10V		165	225	mΩ
	RDS(on)2	ID=1A, VGS=4.5V		180	254	mΩ
	RDS(on)3	ID=1A, VGS=4V		190	275	mΩ
Input Capacitance	Ciss	VDS=10V, f=1MHz		490		pF
Output Capacitance	Coss			34		pF
Reverse Transfer Capacitance	Crss			13		pF
Turn-ON Delay Time	tD(on)	See specified Test Circuit.		9.3		ns
Rise Time	tr			5.4		ns
Turn-OFF Delay Time	tD(off)			42		ns
Fall Time	tf			26		ns

Continued on next page.

ORDERING INFORMATION

See detailed ordering and shipping information on page 7 of this data sheet.

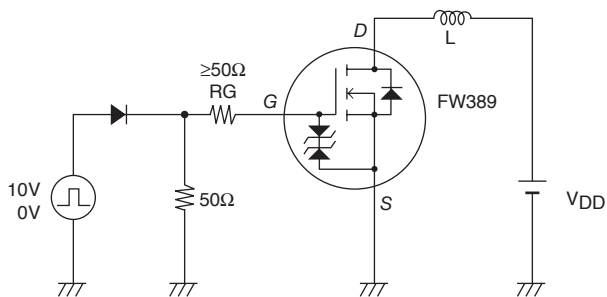
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Electrical Characteristics at $T_a=25^{\circ}\text{C}$

Parameter	Symbol	Conditions	Ratings			Unit
			min	typ	max	
[N-channel]						
Total Gate Charge	Qg	VDS=50V, VGS=10V, ID=2A		10		nC
Gate-to-Source Charge	Qgs			1.4		nC
Gate-to-Drain “Miller” Charge	Qgd			2.1		nC
Diode Forward Voltage	VSD	IS=2A, VGS=0V		0.78	1.2	V
Gata Resistance	Rg	VDS=0V, VGS=0V, f=1MHz	0		12	Ω
[P-channel]						
Drain-to-Source Breakdown Voltage	V(BR)DSS	ID=-1mA, VGS=0V	-100			V
Zero-Gate Voltage Drain Current	IDSS	VDS=-100V, VGS=0V			-1	μA
Gate-to-Source Leakage Current	IGSS	VGS=±16V, VDS=0V			±10	μA
Cutoff Voltage	VGS(off)	VDS=-10V, ID=-1mA	-1.2		-2.6	V
Forward Transfer Admittance	yfs	VDS=-10V, ID=-2A		4.7		S
Static Drain-to-Source On-State Resistance	RDS(on)1	ID=-2A, VGS=-10V		230	300	mΩ
	RDS(on)2	ID=-1A, VGS=-4.5V		240	336	mΩ
	RDS(on)3	ID=-1A, VGS=-4V		250	355	mΩ
Input Capacitance	Ciss	VDS=-20V, f=1MHz		1000		pF
Output Capacitance	Coss			77		pF
Reverse Transfer Capacitance	Crss			47		pF
Turn-ON Delay Time	t _d (on)	See specified Test Circuit.		12		ns
Rise Time	t _r			16		ns
Turn-OFF Delay Time	t _d (off)			110		ns
Fall Time	t _f			40		ns
Total Gate Charge	Qg	VDS=-50V, VGS=-10V, ID=-2A		21		nC
Gate-to-Source Charge	Qgs			2.8		nC
Gate-to-Drain “Miller” Charge	Qgd			4.4		nC
Diode Forward Voltage	VSD	IS=-2A, VGS=0V		-0.79	-1.2	V
Gata Resistance	Rg	VDS=0V, VGS=0V, f=1MHz	0		50	Ω

Fig.1 Unclamped Inductive Switching Test Circuit

[N-channel]



[P-channel]

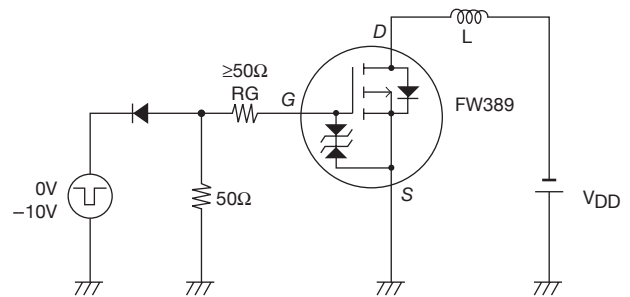
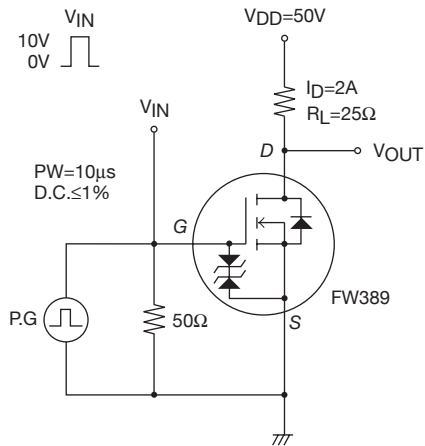
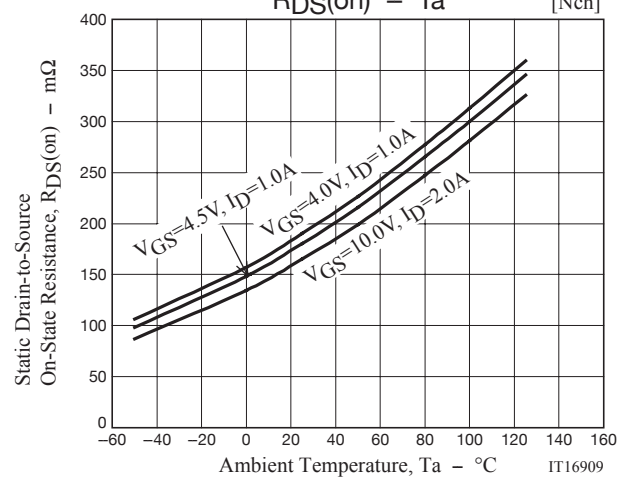
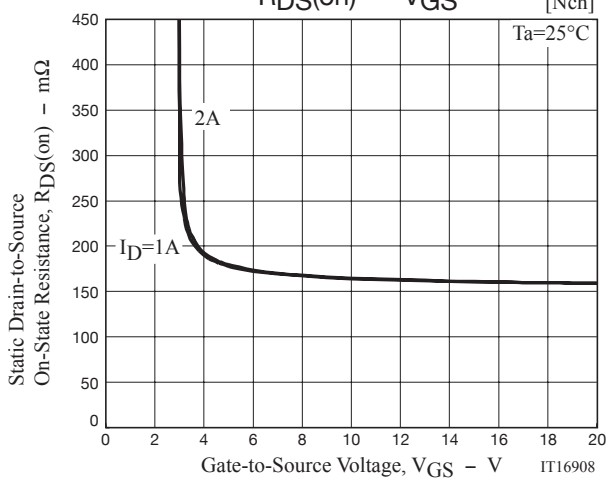
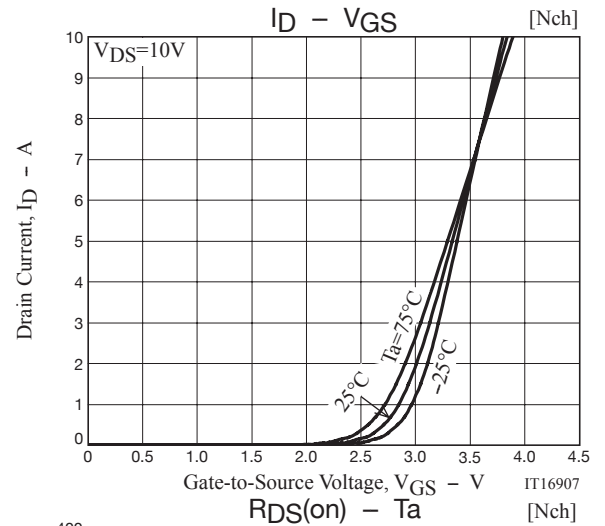
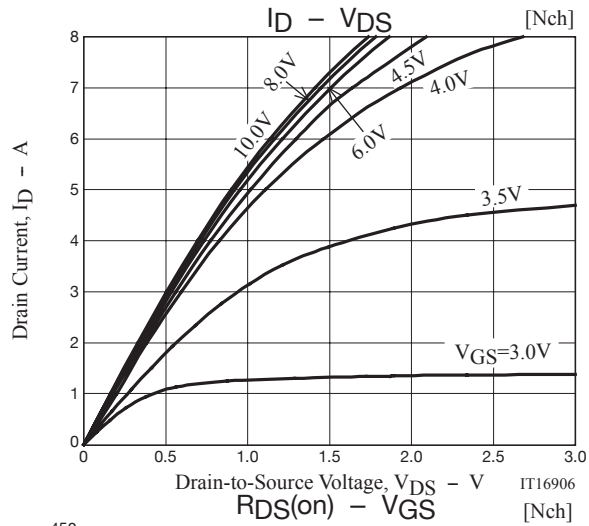
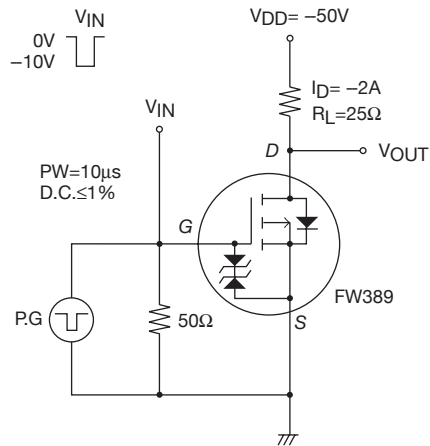


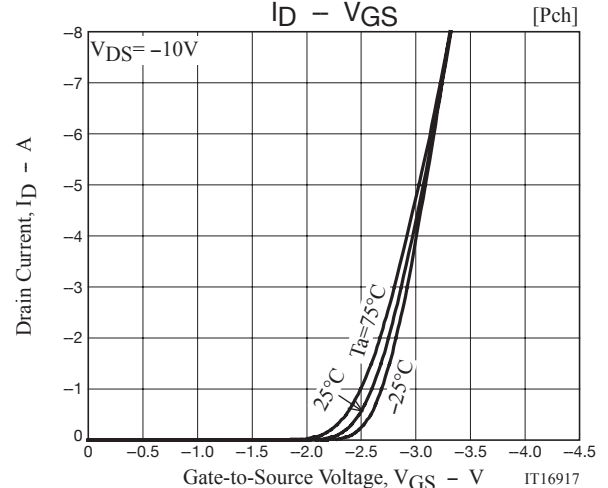
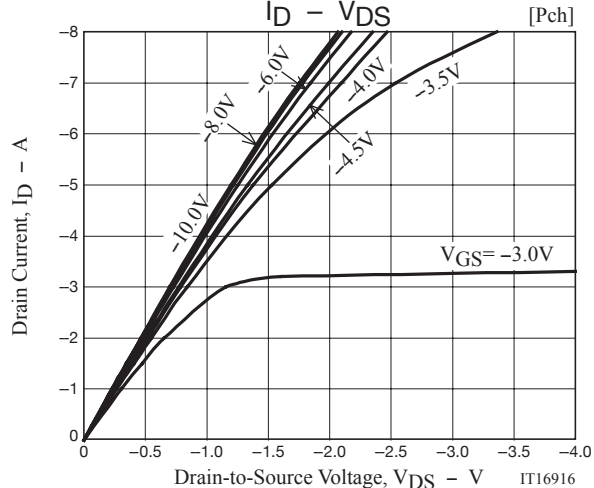
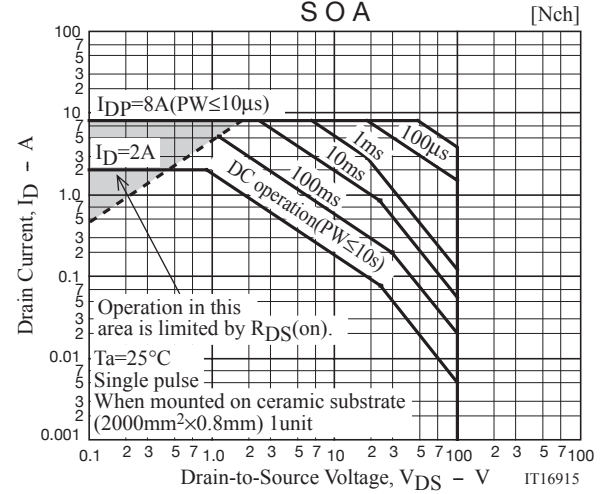
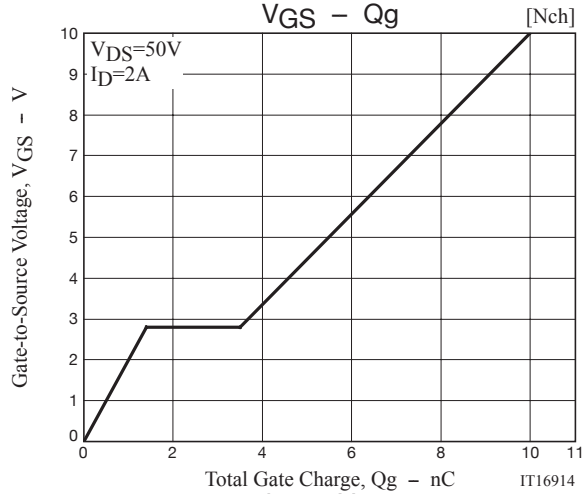
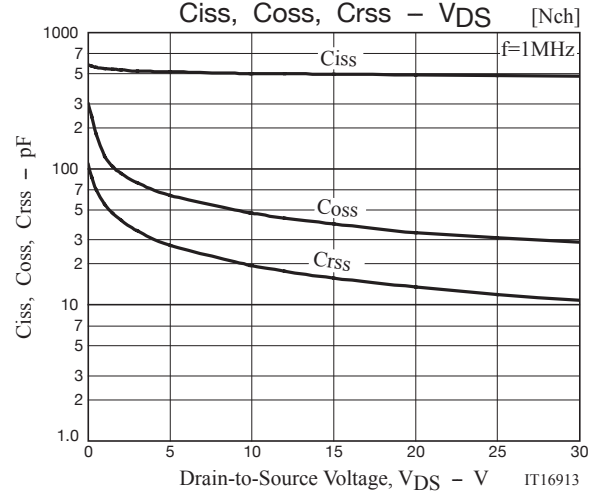
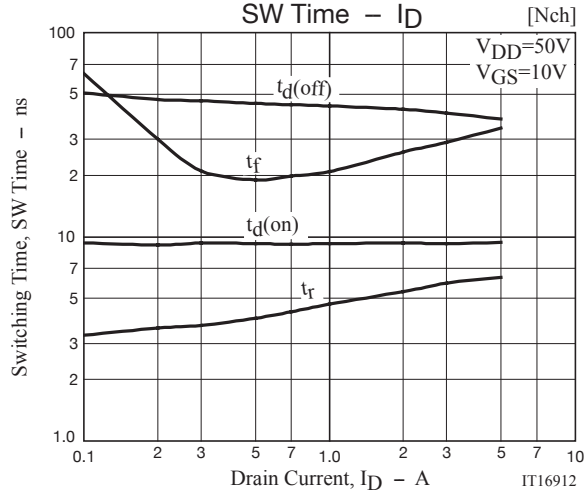
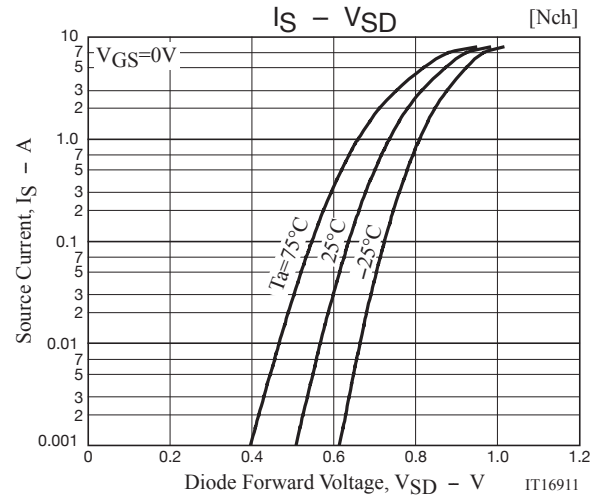
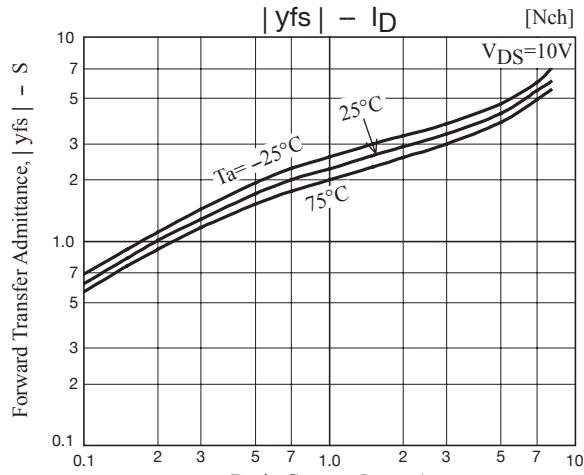
Fig.2 Switching Time Test Circuit

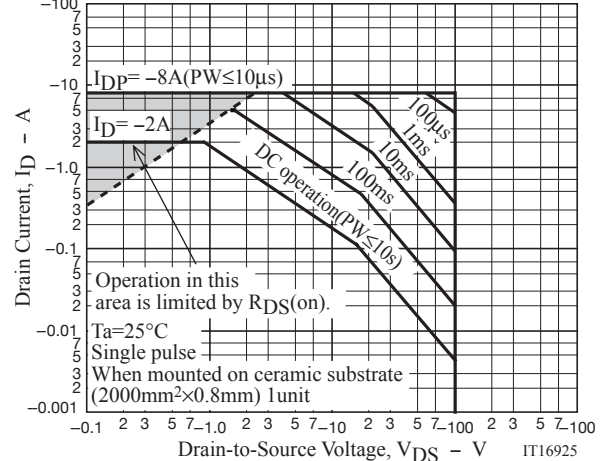
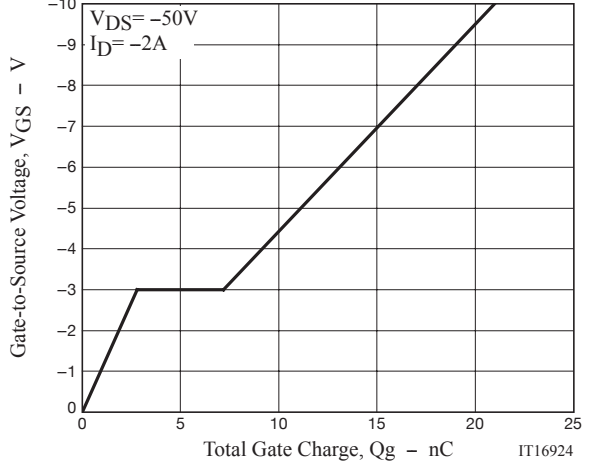
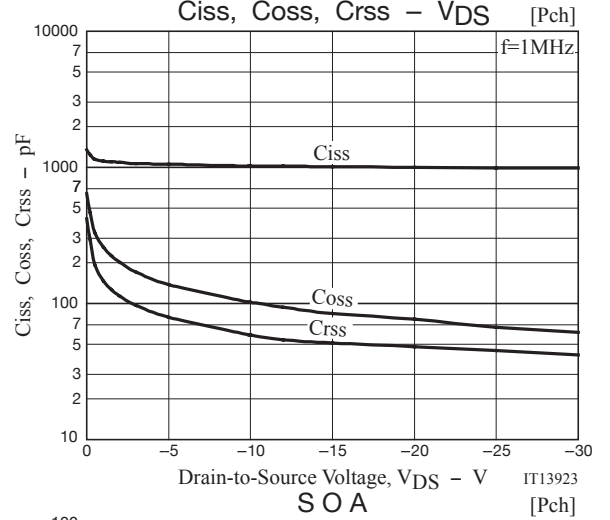
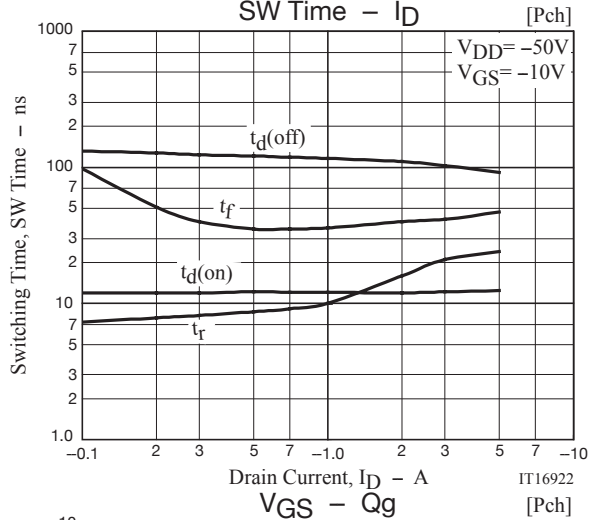
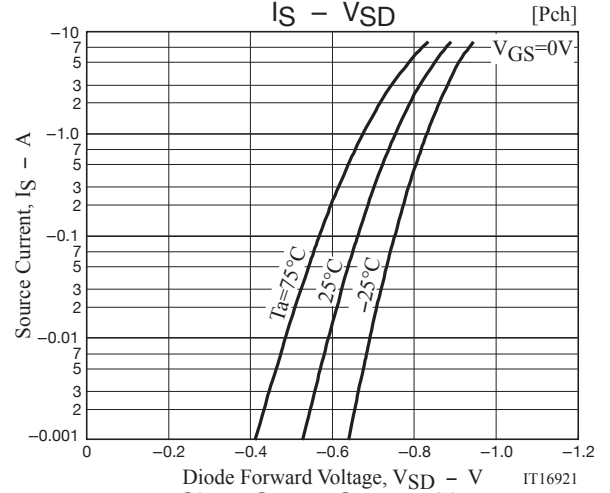
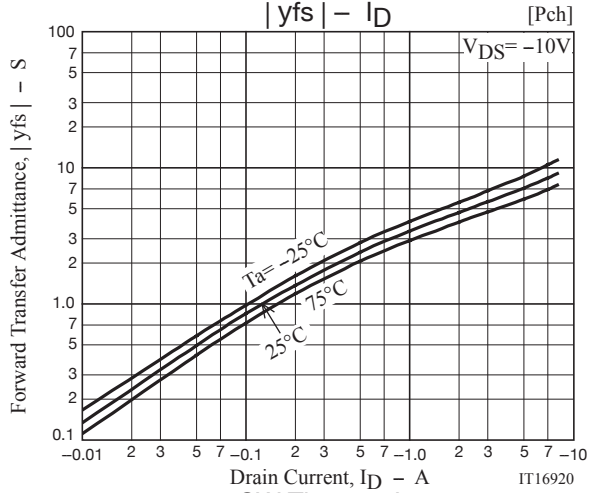
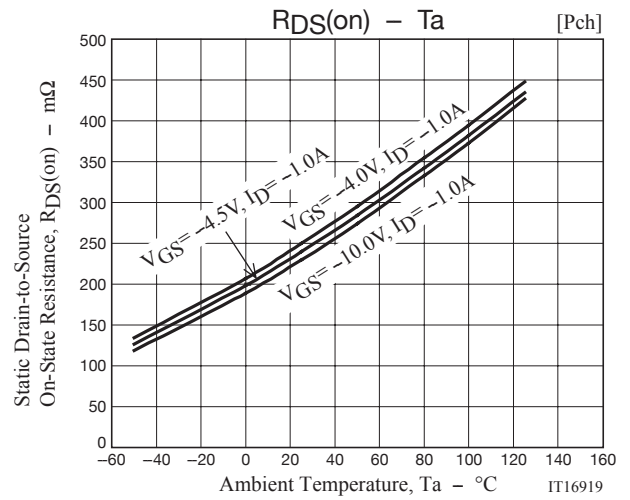
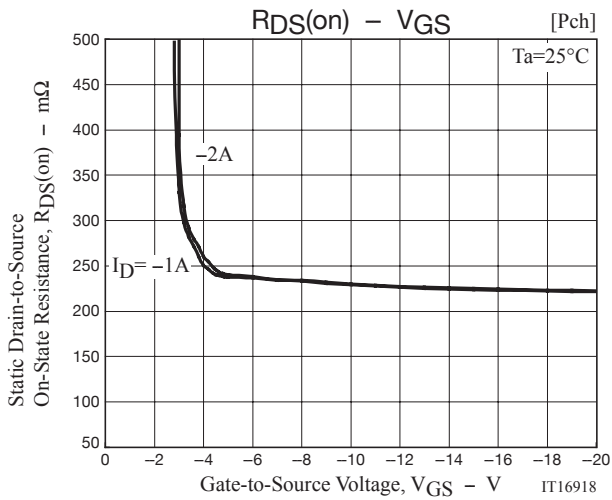
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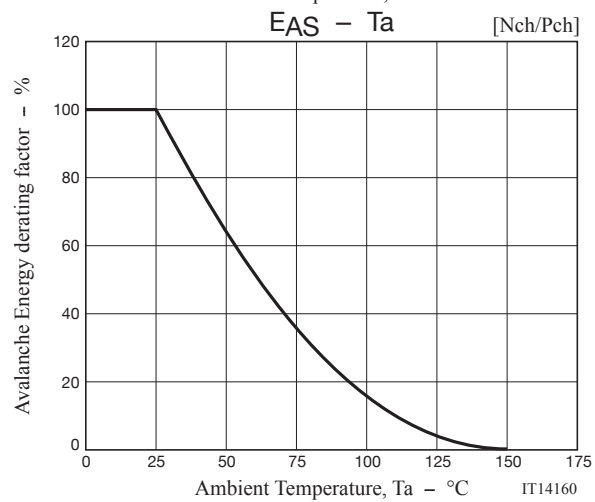
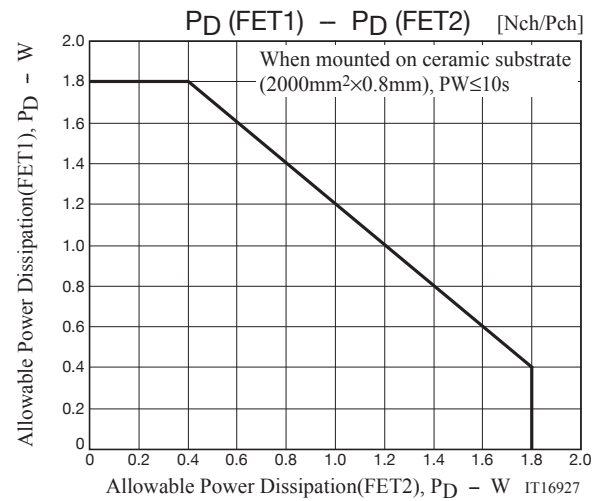
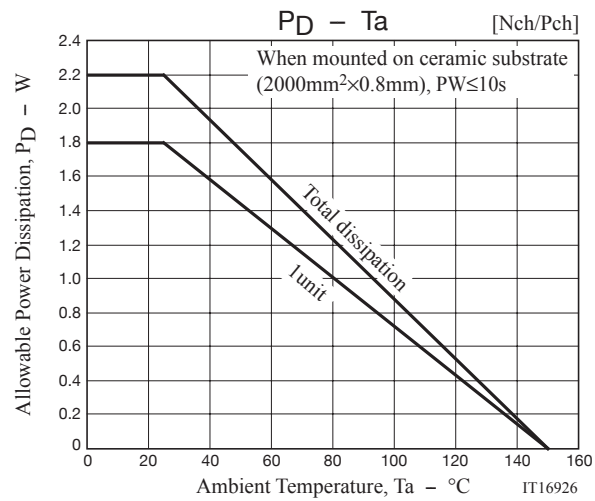


[P-channel]









Package Dimensions

FW389-TL-2W

SOIC-8

CASE 751CR

ISSUE O

unit : mm

1:Source1

2:Gate1

3:Source2

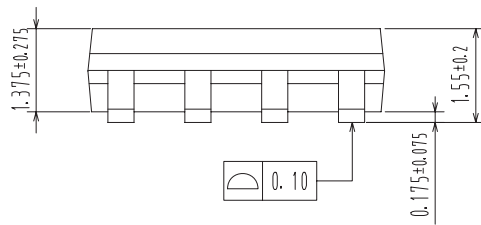
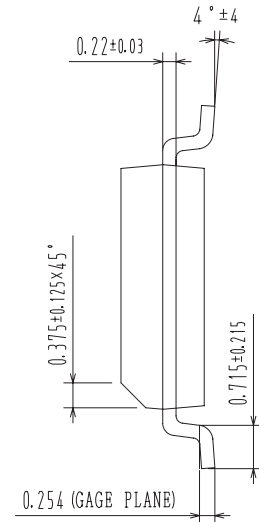
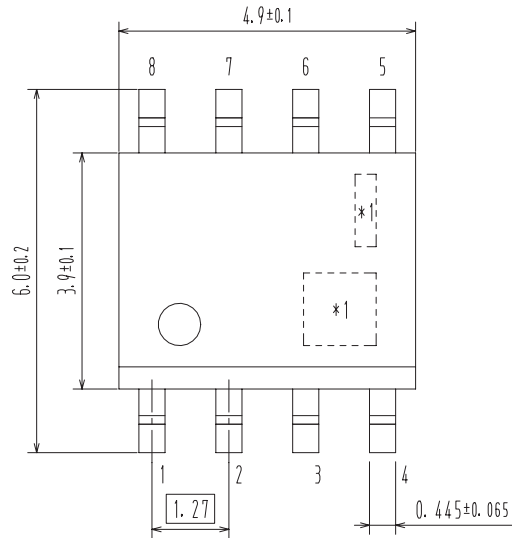
4:Gate2

5:Drain

6:Drain

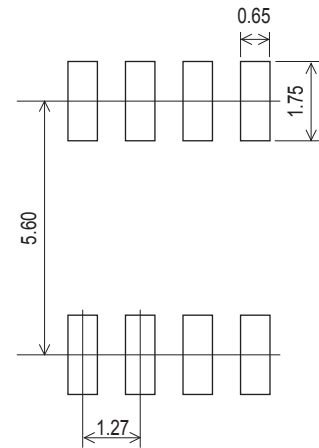
7:Drain

8:Drain

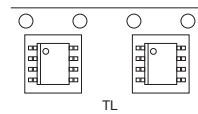
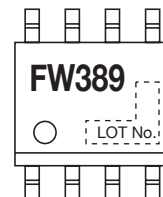
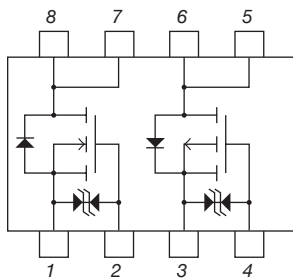


*1:Lot Indication,

*2:Lot Indication, Some products have no Lot indication,

Land Pattern Example**Ordering & Package Information**

Device	Package	Shipping	note
FW389-TL-2W	SOIC8, SC-87, SOT-96	2,500 pcs. / reel	Pb-Free and Halogen Free

Packing Type:TL**Marking****Electrical Connection**

Note on usage : Since the FW389 is a MOSFET product, please avoid using this device in the vicinity of highly charged objects.

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