



ON Semiconductor®

# ON Semiconductor DATA SHEET

## N-Channel and P-Channel Silicon MOSFETs

# FW905 — General-Purpose Switching Device

## Applications

### Features

- Composite type with an N-channel MOSFET and a P-channel MOSFET driving from a 2.5V supply voltage contained in a single package.
- High-density mounting.

### Specifications

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

Parameter	Symbol	Conditions	N-channel	P-channel	Unit
Drain-to-Source Voltage	V <sub>DSS</sub>		20	-20	V
Gate-to-Source Voltage	V <sub>GSS</sub>		±10	±10	V
Drain Current (DC)	I <sub>D</sub>		7	-6	A
Drain Current (PW≤10μs)	I <sub>DP</sub>	Duty cycle≤1%	52	-52	A
Allowable Power Dissipation	P <sub>D</sub>	Mounted on a ceramic board (1500mm <sup>2</sup> ×0.8mm)1unit, PW≤10s	2.3		W
Total Dissipation	P <sub>T</sub>	Mounted on a ceramic board (1500mm <sup>2</sup> ×0.8mm), PW≤10s	2.5		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	20			V
Zero-Gate Voltage Drain Current	I <sub>DSS</sub>	V <sub>DS</sub> =20V, V <sub>GS</sub> =0V			1	μA
Gate-to-Source Leakage Current	I <sub>GSS</sub>	V <sub>GS</sub> =±8V, V <sub>DS</sub> =0V			±10	μA
Cutoff Voltage	V <sub>GS(off)</sub>	V <sub>DS</sub> =10V, I <sub>D</sub> =1mA	0.5		1.3	V
Forward Transfer Admittance	y <sub>fs</sub>	V <sub>DS</sub> =10V, I <sub>D</sub> =7A	9	15		S
Static Drain-to-Source On-State Resistance	R <sub>DS(on)1</sub>	I <sub>D</sub> =7A, V <sub>GS</sub> =4V		18	24	mΩ
	R <sub>DS(on)2</sub>	I <sub>D</sub> =3A, V <sub>GS</sub> =2.5V		20	33	mΩ
Input Capacitance	C <sub>iss</sub>	V <sub>DS</sub> =10V, f=1MHz		1530		pF
Output Capacitance	C <sub>oss</sub>	V <sub>DS</sub> =10V, f=1MHz		230		pF
Reverse Transfer Capacitance	C <sub>rss</sub>	V <sub>DS</sub> =10V, f=1MHz		215		pF

Marking : W905

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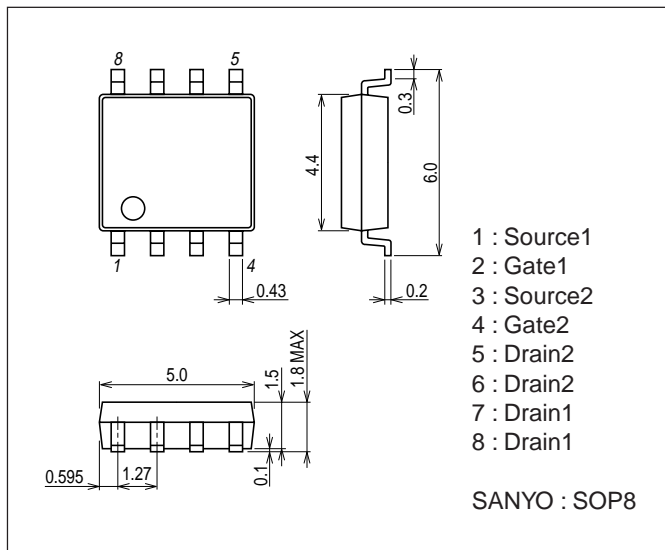
# FW905

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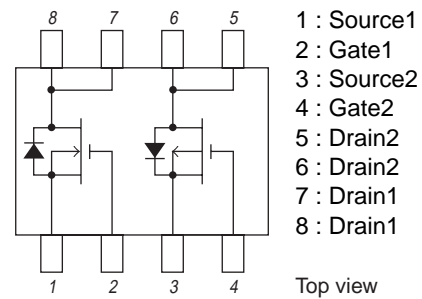
Parameter	Symbol	Conditions	Ratings			Unit
			min	typ	max	
Turn-ON Delay Time	$t_{d(on)}$	See specified Test Circuit.		19		ns
Rise Time	$t_r$	See specified Test Circuit.		225		ns
Turn-OFF Delay Time	$t_{d(off)}$	See specified Test Circuit.		125		ns
Fall Time	$t_f$	See specified Test Circuit.		125		ns
Total Gate Charge	$Q_g$	$V_{DS}=10V, V_{GS}=4V, I_D=7A$		18.5		nC
Gate-to-Source Charge	$Q_{gs}$	$V_{DS}=10V, V_{GS}=4V, I_D=7A$		3.4		nC
Gate-to-Drain "Miller" Charge	$Q_{gd}$	$V_{DS}=10V, V_{GS}=4V, I_D=7A$		4.8		nC
Diode Forward Voltage	$V_{SD}$	$I_S=7A, V_{GS}=0V$		0.79	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	$\mu A$
Gate-to-Source Leakage Current	$I_{GSS}$	$V_{GS}=\pm 8V, V_{DS}=0V$			$\pm 10$	$\mu A$
Cutoff Voltage	$V_{GS(off)}$	$V_{DS}=-10V, I_D=-1mA$	-0.4			V
Forward Transfer Admittance	$ y_{fs} $	$V_{DS}=-10V, I_D=-6A$	7.8	13		S
Static Drain-to-Source On-State Resistance	$R_{DS(on)1}$	$I_D=-6A, V_{GS}=-4V$		30	40	$m\Omega$
	$R_{DS(on)2}$	$I_D=-3A, V_{GS}=-2.5V$		42	59	$m\Omega$
Input Capacitance	$C_{iss}$	$V_{DS}=-10V, f=1MHz$		1720		pF
Output Capacitance	$C_{oss}$	$V_{DS}=-10V, f=1MHz$		260		pF
Reverse Transfer Capacitance	$C_{rss}$	$V_{DS}=-10V, f=1MHz$		245		pF
Turn-ON Delay Time	$t_{d(on)}$	See specified Test Circuit.		19		ns
Rise Time	$t_r$	See specified Test Circuit.		390		ns
Turn-OFF Delay Time	$t_{d(off)}$	See specified Test Circuit.		110		ns
Fall Time	$t_f$	See specified Test Circuit.		145		ns
Total Gate Charge	$Q_g$	$V_{DS}=-10V, V_{GS}=-4V, I_D=-6A$		18.4		nC
Gate-to-Source Charge	$Q_{gs}$	$V_{DS}=-10V, V_{GS}=-4V, I_D=-6A$		3.2		nC
Gate-to-Drain "Miller" Charge	$Q_{gd}$	$V_{DS}=-10V, V_{GS}=-4V, I_D=-6A$		5.2		nC
Diode Forward Voltage	$V_{SD}$	$I_S=-6A, V_{GS}=0V$		-0.82	-1.2	V

## Package Dimensions

unit : mm  
7005-003

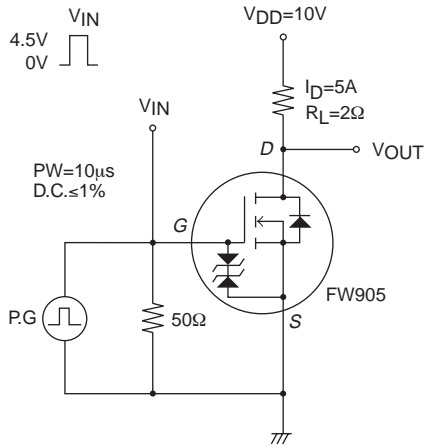


## Electrical Connection

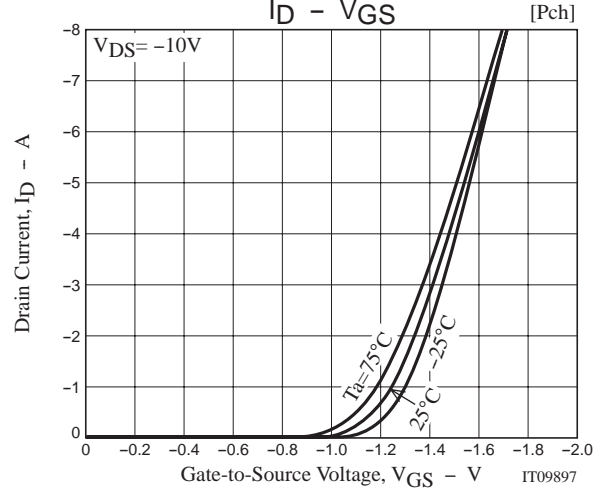
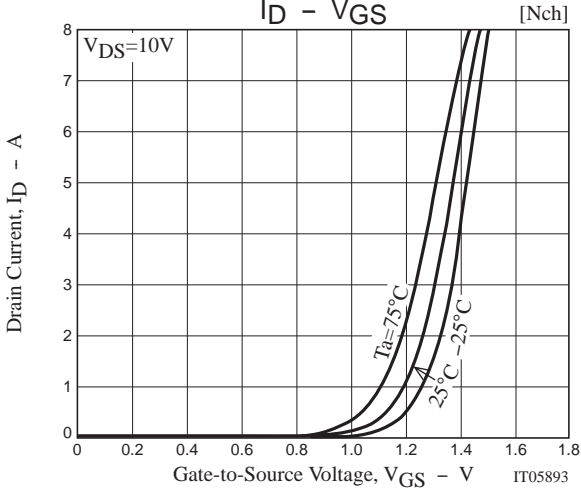
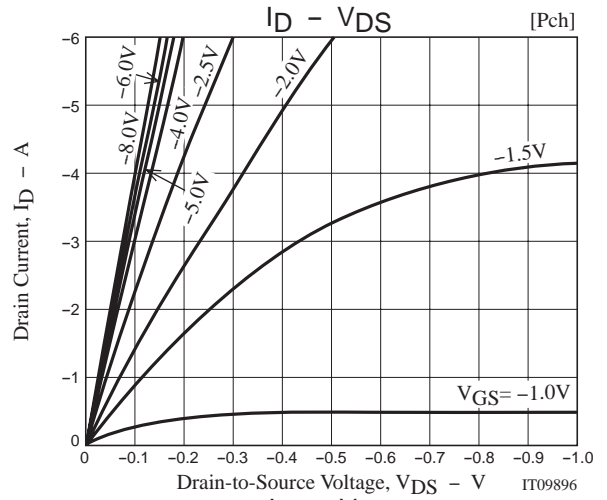
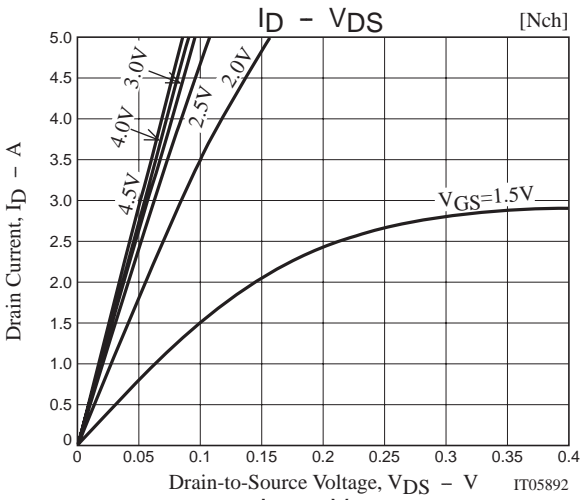
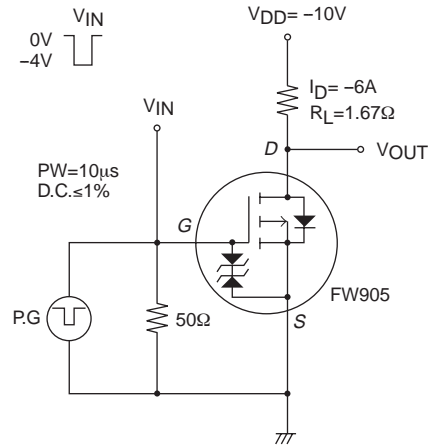


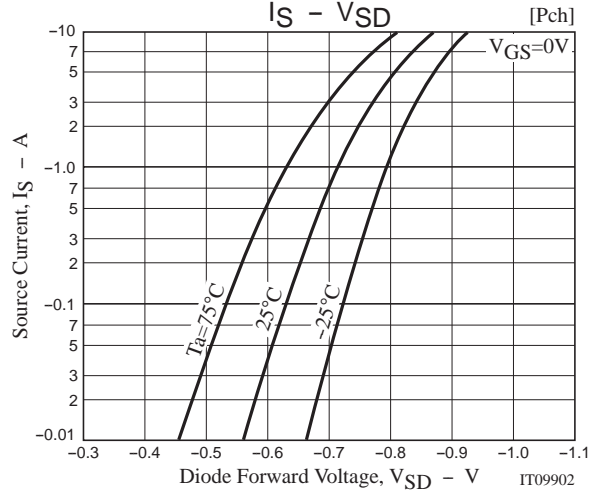
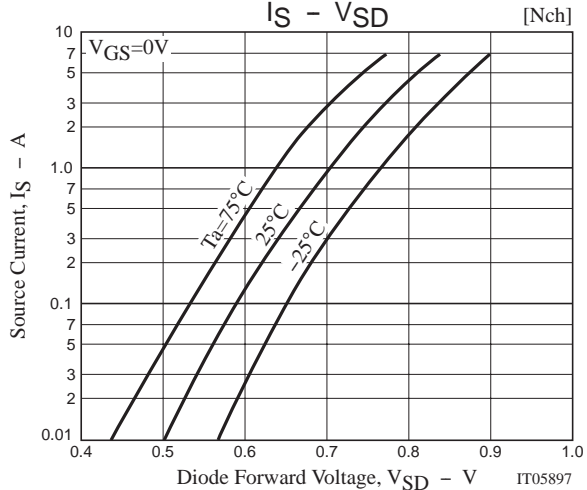
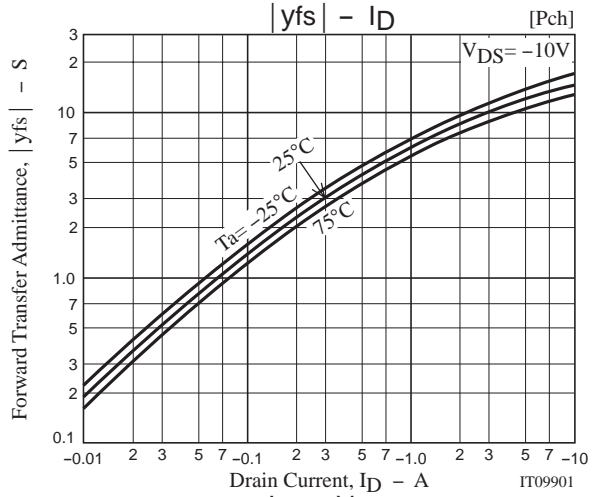
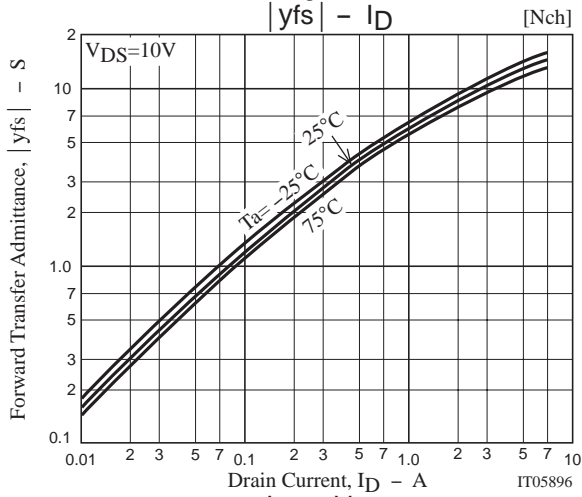
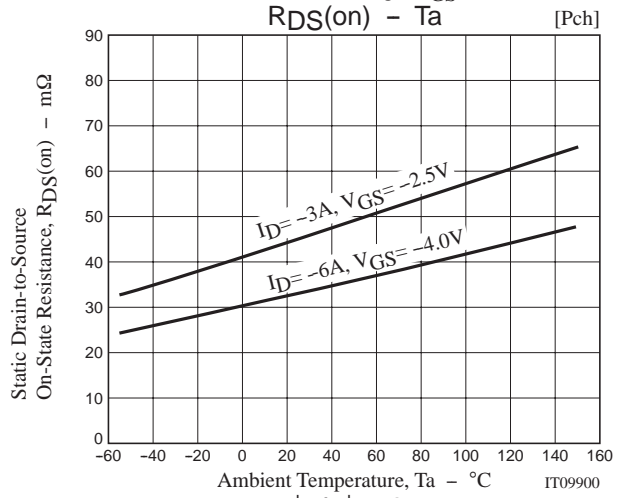
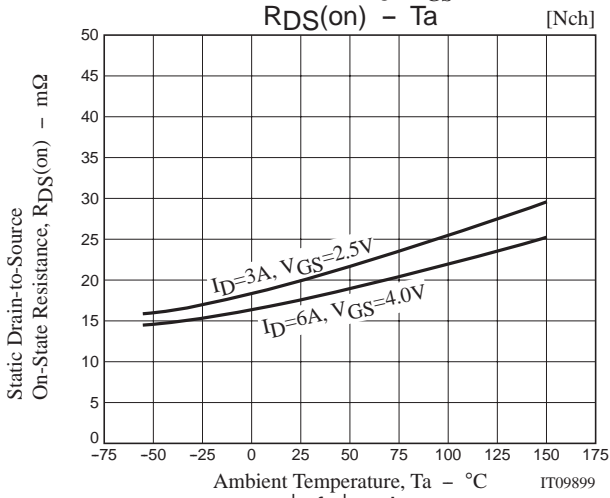
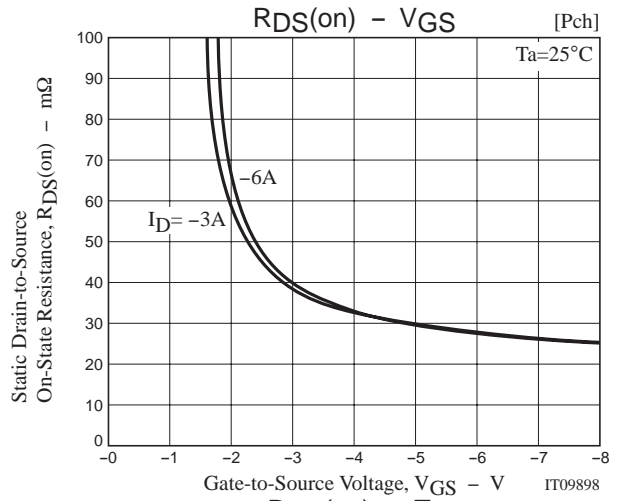
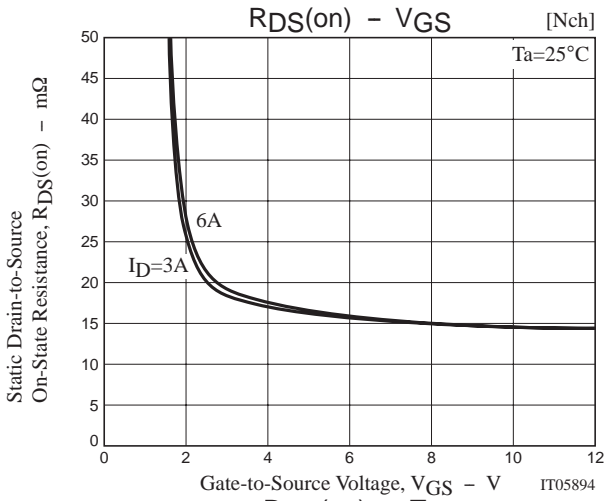
Switching Time Test Circuit

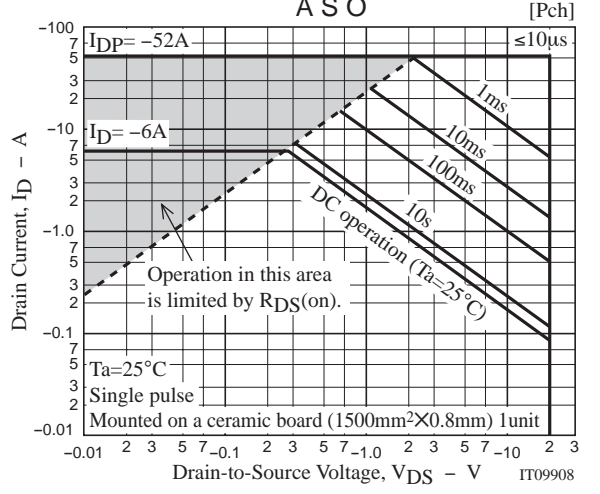
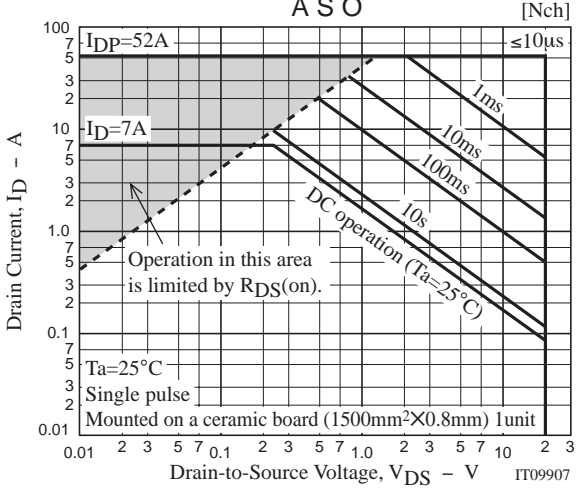
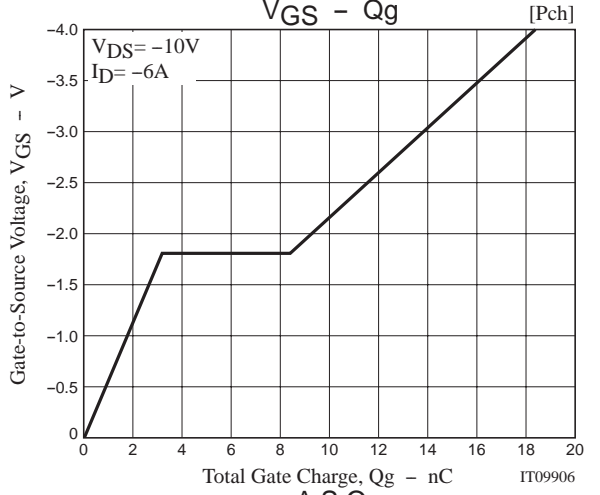
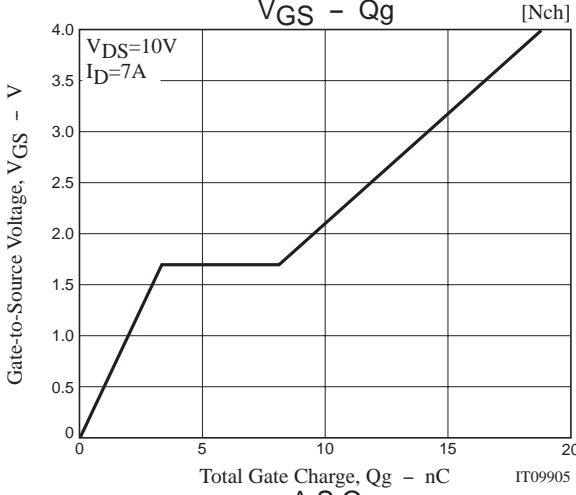
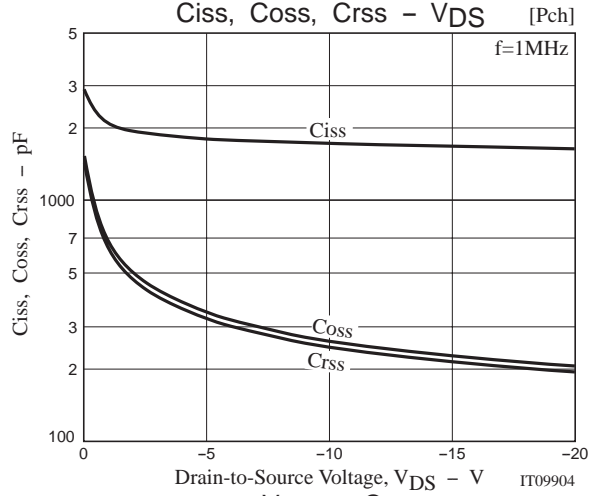
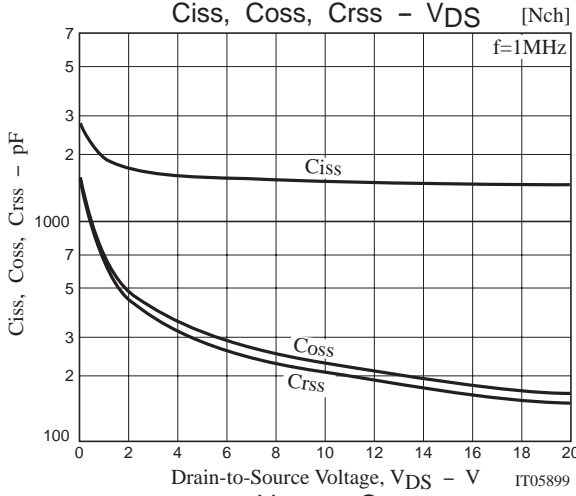
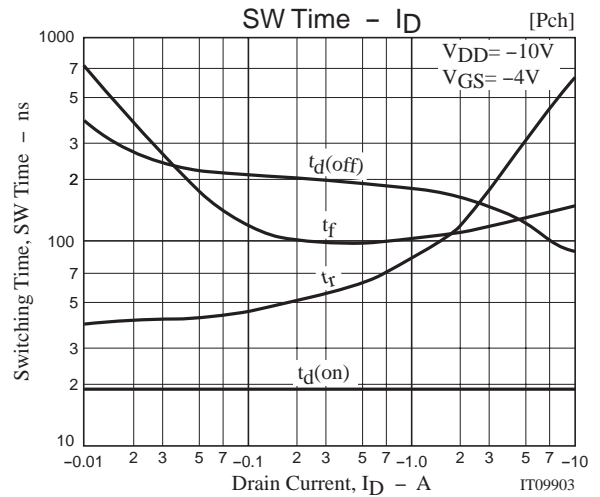
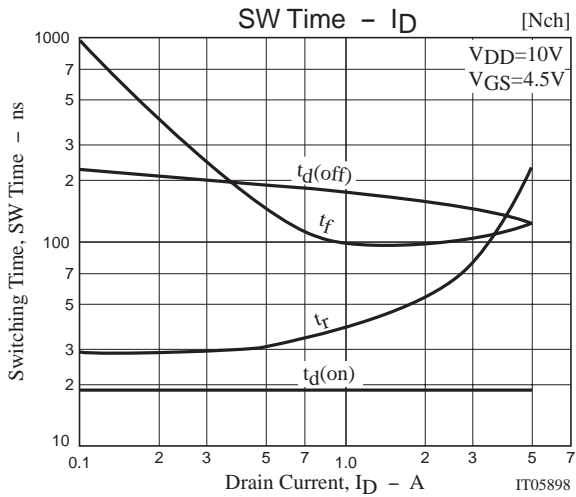
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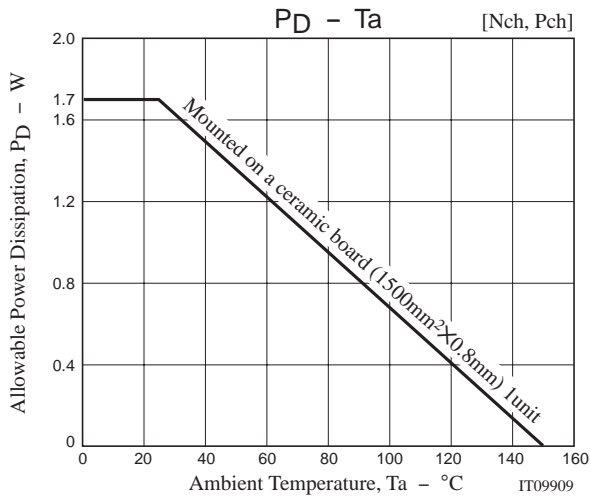
[P-channel]







# FW905



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