Ordering number : EN8754

ON Semiconductor®

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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_{DSS}		20	−20	V
Gate-to-Source Voltage	V_{GSS}		±10	±10	V
Drain Current (DC)	I_D		7	−6	A
Drain Current (PW≤10μs)	I_{DP}	Duty cycle≤1%	52	−52	A
Allowable Power Dissipation	P_D	Mounted on a ceramic board (1500mm²×0.8mm)1unit, PW≤10s	2.3		W
Total Dissipation	P_T	Mounted on a ceramic board (1500mm²×0.8mm), PW≤10s	2.5		W
Channel Temperature	Tch		150		°C
Storage Temperature	Tstg		−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	$V_{(BR)DSS}$	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}=±8V, V_{DS}=0V			±10	μA
Cutoff Voltage	$V_{GS}(off)$	V_{DS}=10V, I_D=1mA	0.5		1.3	V
Forward Transfer Admittance	$\|yfs\|$	V_{DS}=10V, I_D=7A	9	15		S
Static Drain-to-Source On-State Resistance	$R_{DS}(on)1$	I_D=7A, V_{GS}=4V		18	24	mΩ
	$R_{DS}(on)2$	I_D=3A, V_{GS}=2.5V		20	33	mΩ
Input Capacitance	Ciss	V_{DS}=10V, f=1MHz		1530		pF
Output Capacitance	Coss	V_{DS}=10V, f=1MHz		230		pF
Reverse Transfer Capacitance	Crss	V_{DS}=10V, f=1MHz		215		pF

Marking : W905

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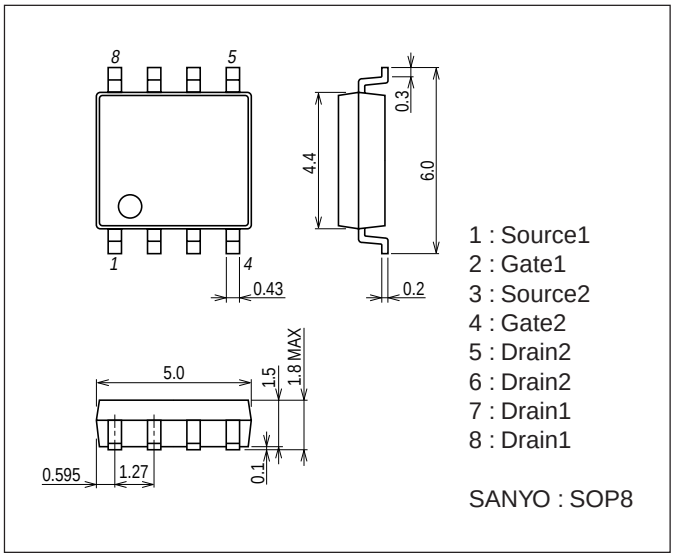
Parameter	Symbol	Conditions	Ratings			Unit
			min	typ	max	
Turn-ON Delay Time	t_{d}(on)	See specified Test Circuit.		19		ns
Rise Time	t_{r}	See specified Test Circuit.		225		ns
Turn-OFF Delay Time	t_{d}(off)	See specified Test Circuit.		125		ns
Fall Time	t_{f}	See specified Test Circuit.		125		ns
Total Gate Charge	Qg	V_{DS}=10V, V_{GS}=4V, I_{D}=7A		18.5		nC
Gate-to-Source Charge	Qgs	V_{DS}=10V, V_{GS}=4V, I_{D}=7A		3.4		nC
Gate-to-Drain “Miller” Charge	Qgd	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	μA
Gate-to-Source Leakage Current	I_{GSS}	V_{GS}=±8V, V_{DS}=0V			±10	μA
Cutoff Voltage	V_{GS}(off)	V_{DS}=-10V, I_{D}=-1mA	-0.4		-1.4	V
Forward Transfer Admittance	|yfs|	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	mΩ
	R_{DS}(on)2	I_{D}=-3A, V_{GS}=-2.5V		42	59	mΩ
Input Capacitance	Ciss	V_{DS}=-10V, f=1MHz		1720		pF
Output Capacitance	Coss	V_{DS}=-10V, f=1MHz		260		pF
Reverse Transfer Capacitance	Crss	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	Qg	V_{DS}=-10V, V_{GS}=-4V, I_{D}=-6A		18.4		nC
Gate-to-Source Charge	Qgs	V_{DS}=-10V, V_{GS}=-4V, I_{D}=-6A		3.2		nC
Gate-to-Drain “Miller” Charge	Qgd	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

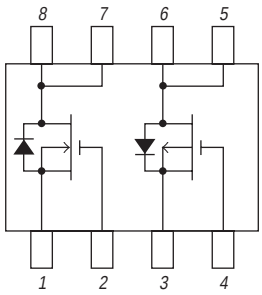
7005-003



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

SANYO : SOP8

Electrical Connection

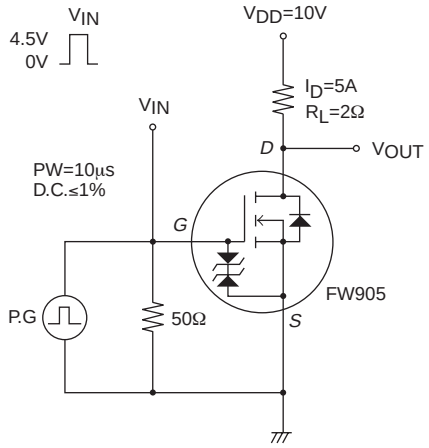


1 : Source1
2 : Gate1
3 : Source2
4 : Gate2
5 : Drain2
6 : Drain2
7 : Drain1
8 : Drain1

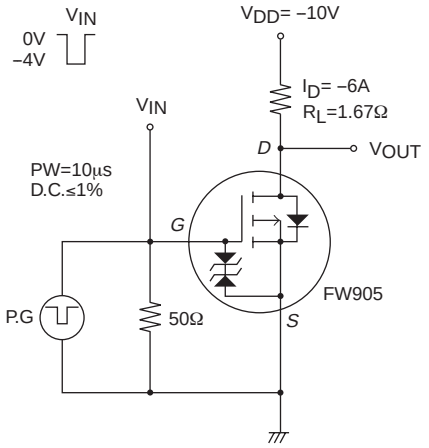
Top view

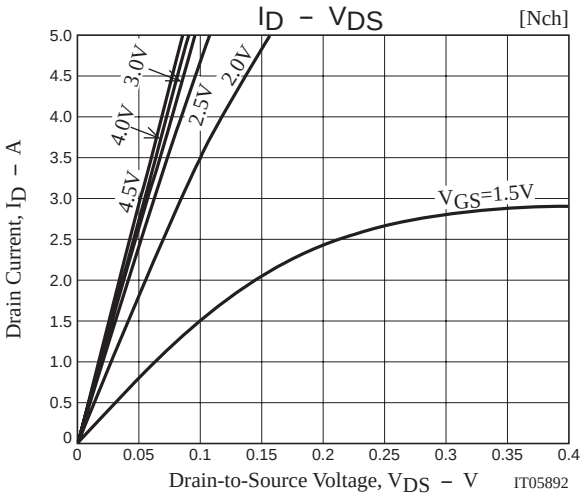
Switching Time Test Circuit

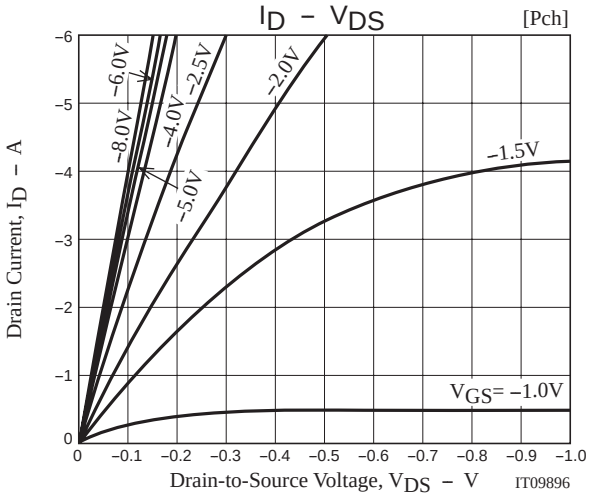
[N-channel]

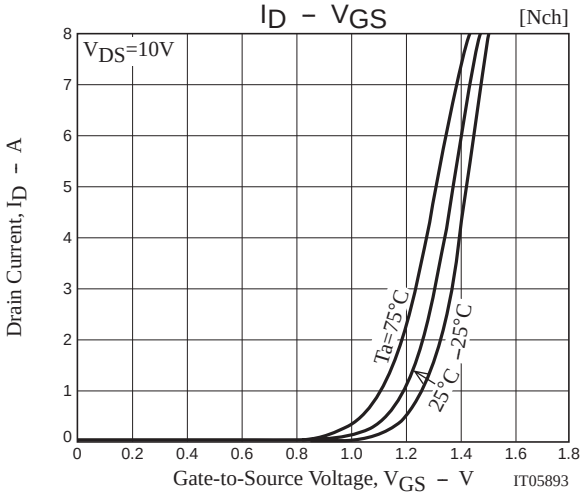


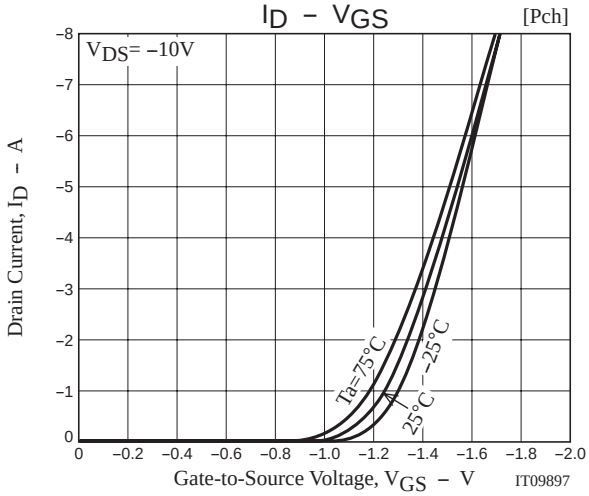
[P-channel]

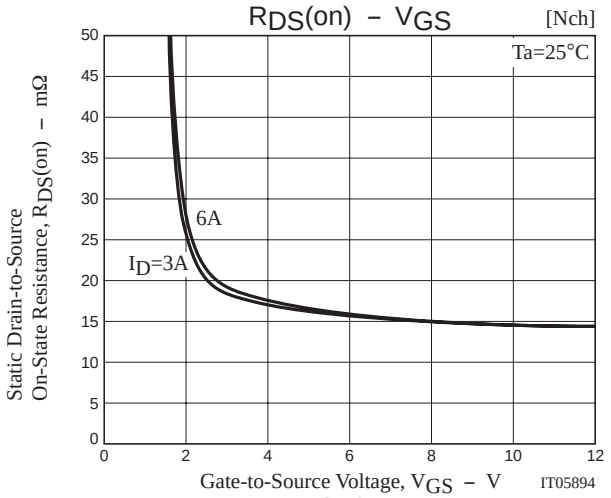


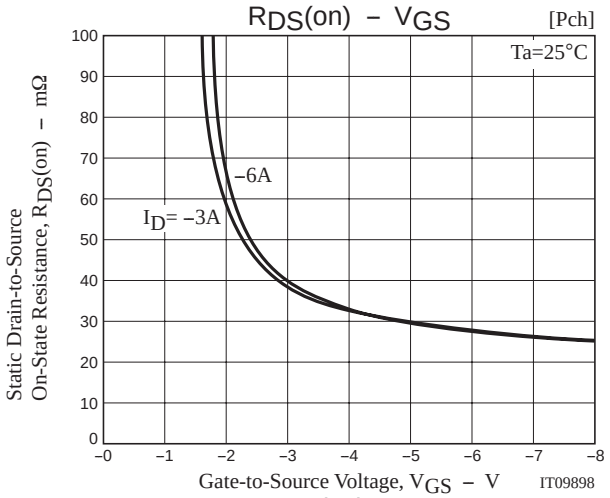


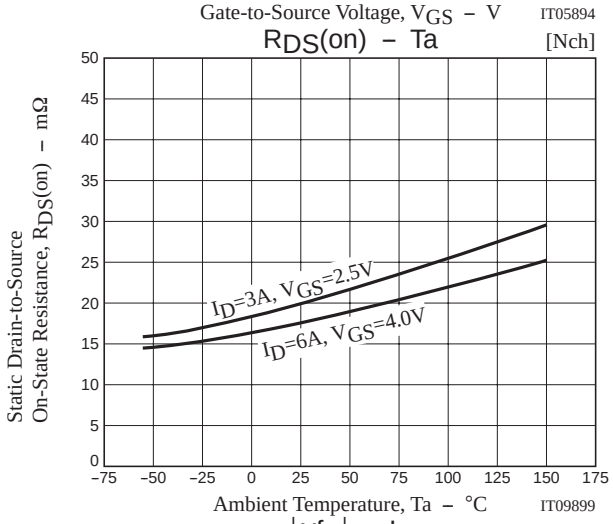


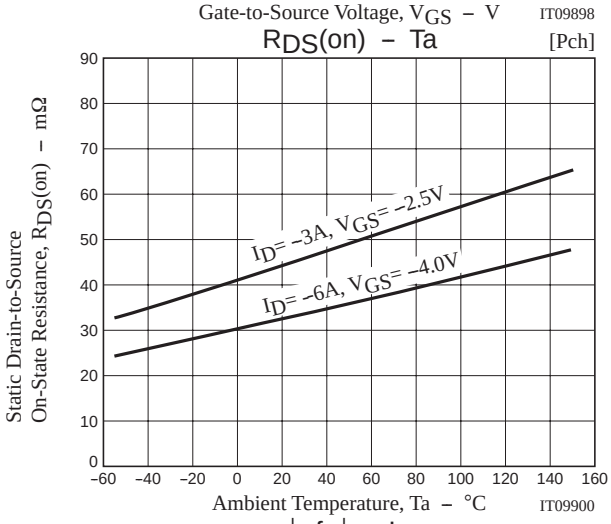


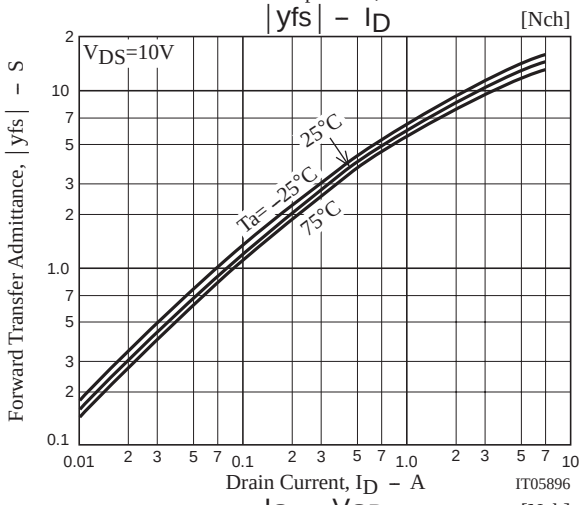


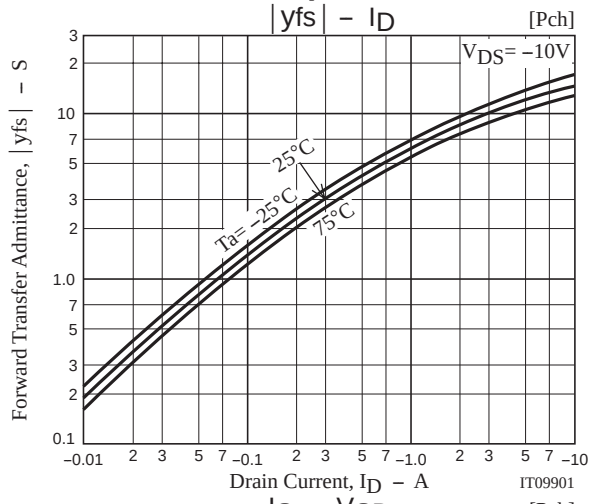

RDS(on) – VGS
[Nch]
Ta=25°C
6A
ID=3A
Static Drain-to-Source On-State Resistance, RDS(on) – mΩ
Gate-to-Source Voltage, VGS – V
IT05894

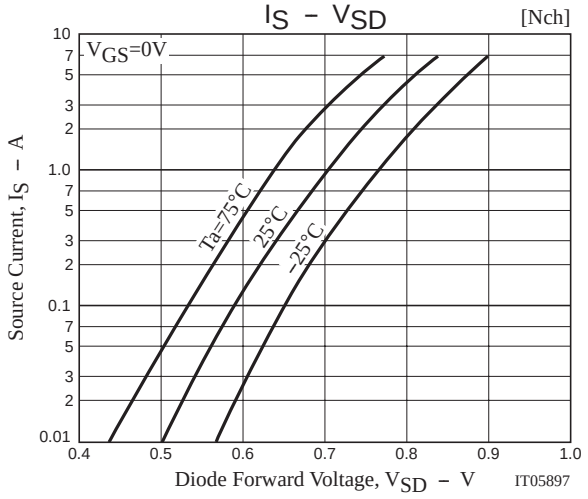

RDS(on) – VGS
[Pch]
Ta=25°C
–6A
ID= –3A
Static Drain-to-Source On-State Resistance, RDS(on) – mΩ
Gate-to-Source Voltage, VGS – V
IT09898

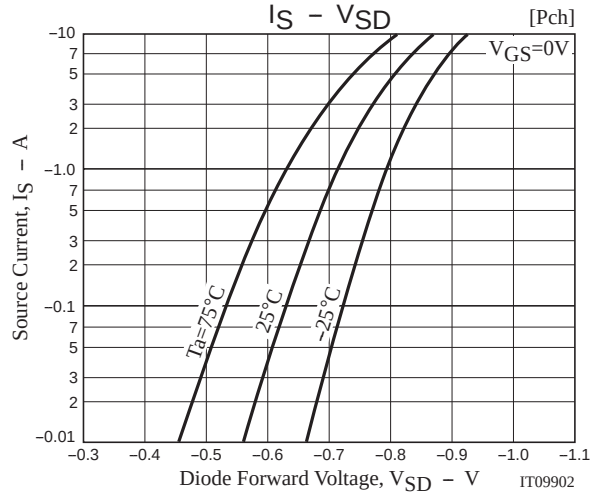

RDS(on) – Ta
[Nch]
ID=3A, VGS=2.5V
ID=6A, VGS=4.0V
Static Drain-to-Source On-State Resistance, RDS(on) – mΩ
Ambient Temperature, Ta – °C
IT09899


RDS(on) – Ta
[Pch]
ID= –3A, VGS= –2.5V
ID= –6A, VGS= –4.0V
Static Drain-to-Source On-State Resistance, RDS(on) – mΩ
Ambient Temperature, Ta – °C
IT09900

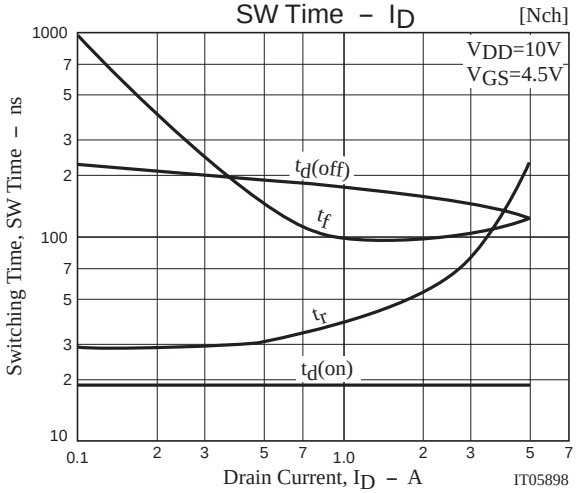

|yfs| – ID
[Nch]
VDS=10V
25°C
Ta= –25°C
75°C
Forward Transfer Admittance, |yfs| – S
Drain Current, ID – A
IT05896


|yfs| – ID
[Pch]
VDS= –10V
25°C
Ta= –25°C
75°C
Forward Transfer Admittance, |yfs| – S
Drain Current, ID – A
IT09901

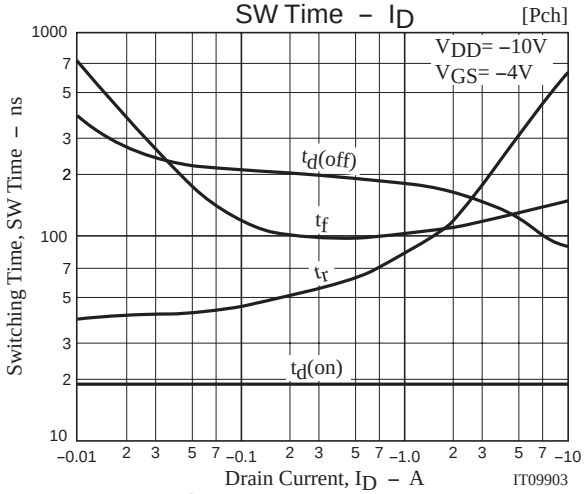

IS – VSD
[Nch]
VGS=0V
Ta=75°C
25°C
–25°C
Source Current, IS – A
Diode Forward Voltage, VSD – V
IT05897


IS – VSD
[Pch]
VGS=0V
Ta=75°C
25°C
–25°C
Source Current, IS – A
Diode Forward Voltage, VSD – V
IT09902

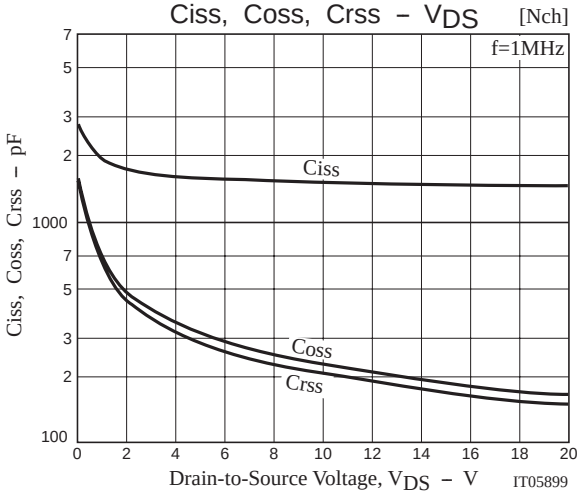
SW Time – I_D [Nch]



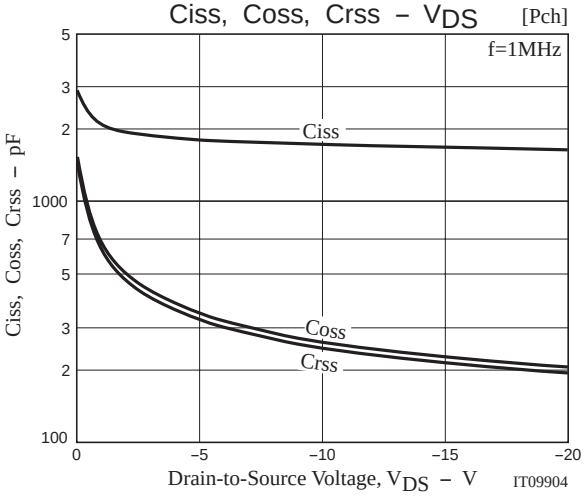
SW Time – I_D [Pch]



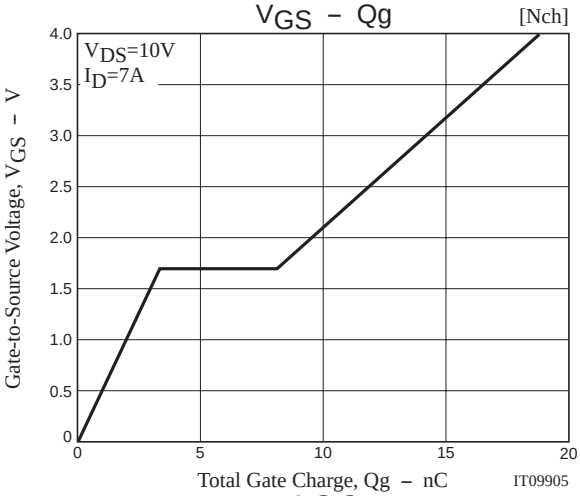
Ciss, Coss, Crss – V_{DS} [Nch]



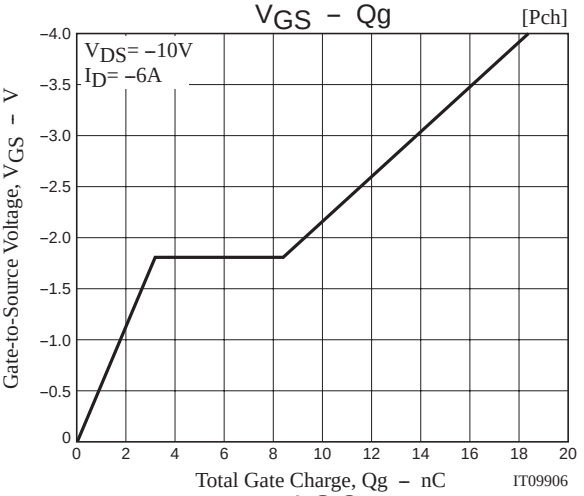
Ciss, Coss, Crss – V_{DS} [Pch]



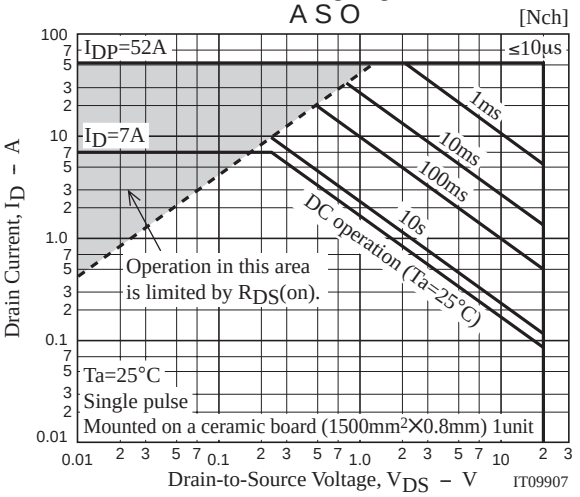
V_{GS} – Qg [Nch]



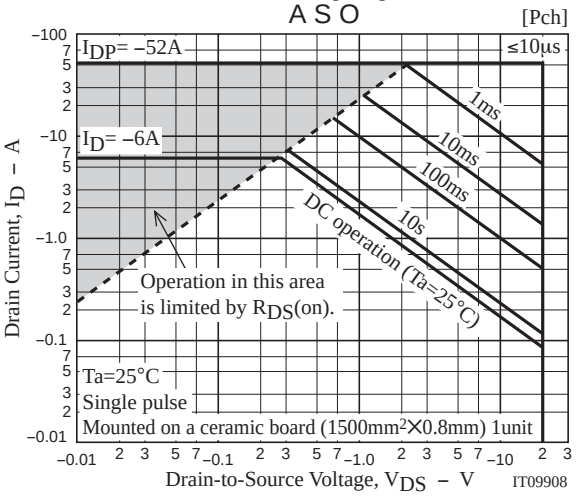
V_{GS} – Qg [Pch]

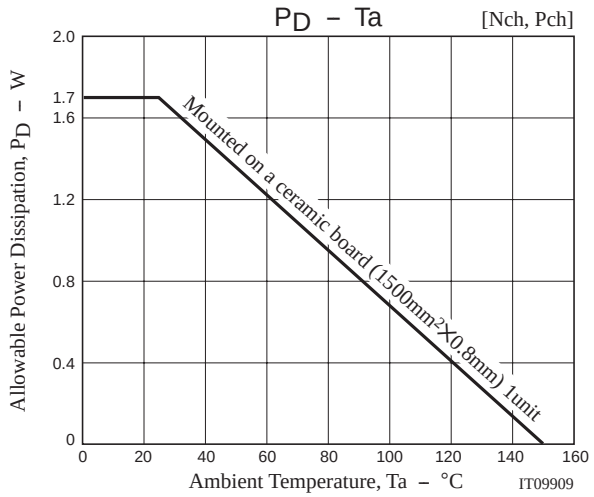


A S O [Nch]



A S O [Pch]





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