Ordering number : ENN7922

SANYO Semiconductors
DATA SHEET

N-Channel and P-Channel Silicon MOSFETs

FW341 — General-Purpose Switching Device Applications

Features

- Low ON-resistance.
- Ultrahigh-speed switching.
- Composite type with an N-channel MOSFET and a P-channel MOSFET driving from a 4V supply voltage contained in a single package.
- High-density mounting.
- Best suited for motor drive application.

Specifications

Absolute Maximum Ratings at Ta=25°C

Parameter	Symbol	Conditions	N-channel	P-channel	Unit
Drain-to-Source Voltage	V_{DSS}		30	−30	V
Gate-to-Source Voltage	V_{GSS}		±20	±20	V
Drain Current (DC)	I_D		3.5	−2.5	A
Drain Current (PW≤10s)	I_D	duty cycle≤1%	4	−3	A
Drain Current (PW≤100ms)	I_D	duty cycle≤1%	6	−4.5	A
Drain Current (PW≤10μs)	I_{DP}	duty cycle≤1%	14	−10	A
Allowable Power Dissipation	P_D	Mounted on a ceramic board (2000mm²×0.8mm)1unit	1.4		W
Total Dissipation	P_T	Mounted on a ceramic board (2000mm²×0.8mm)	1.7		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}=0	30			V
Zero-Gate Voltage Drain Current	I_{DSS}	V_{DS}=30V, V_{GS}=0			1	μA
Gate-to-Source Leakage Current	I_{GSS}	V_{GS}=±16V, V_{DS}=0			±10	μA
Cutoff Voltage	V_{GS}(off)	V_{DS}=10V, I_D=1mA	1.2		2.6	V
Forward Transfer Admittance	|yfs|	V_{DS}=10V, I_D=3.5A	3.0	5.3		S
Static Drain-to-Source On-State Resistance	R_{DS}(on)1	I_D=3.5A, V_{GS}=10V		64	84	mΩ
	R_{DS}(on)2	I_D=1.8A, V_{GS}=4V		105	150	mΩ

Marking : W341

Continued on next page.

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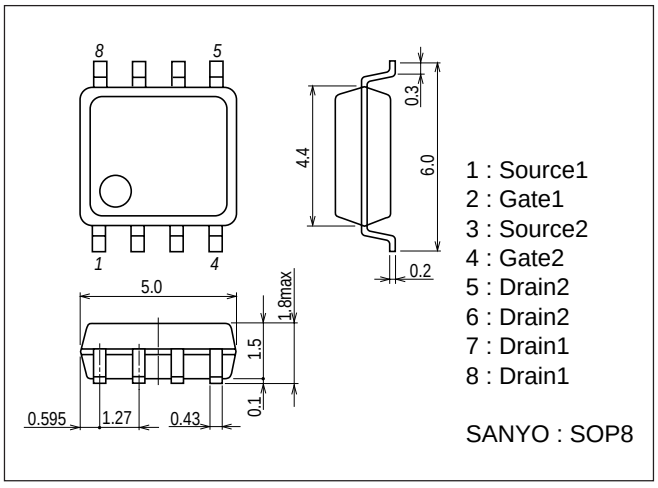
Continued from preceding page.

Parameter	Symbol	Conditions	Ratings			Unit
			min	typ	max	
Input Capacitance	Ciss	V_{DS}=10V, f=1MHz		180		pF
Output Capacitance	Coss	V_{DS}=10V, f=1MHz		42		pF
Reverse Transfer Capacitance	Crss	V_{DS}=10V, f=1MHz		25		pF
Turn-ON Delay Time	t_{d}(on)	See specified Test Circuit.		7		ns
Rise Time	t_{r}	See specified Test Circuit.		15		ns
Turn-OFF Delay Time	t_{d}(off)	See specified Test Circuit.		19		ns
Fall Time	t_{f}	See specified Test Circuit.		5		ns
Total Gate Charge	Qg	V_{DS}=10V, V_{GS}=10V, I_{D}=3.5A		5.0		nC
Gate-to-Source Charge	Qgs	V_{DS}=10V, V_{GS}=10V, I_{D}=3.5A		0.9		nC
Gate-to-Drain “Miller” Charge	Qgd	V_{DS}=10V, V_{GS}=10V, I_{D}=3.5A		0.6		nC
Diode Forward Voltage	V_{SD}	I_{S}=3.5A, V_{GS}=0		0.88	1.2	V
[P-channel]						
Drain-to-Source Breakdown Voltage	$V_{(BR)DSS}$	I_{D}=–1mA, V_{GS}=0	–30			V
Zero-Gate Voltage Drain Current	I_{DSS}	V_{DS}=–30V, V_{GS}=0			–1	μA
Gate-to-Source Leakage Current	I_{GSS}	V_{GS}=±16V, V_{DS}=0			±10	μA
Cutoff Voltage	V_{GS}(off)	V_{DS}=–10V, I_{D}=–1mA	–1.2		–2.6	V
Forward Transfer Admittance	|yfs|	V_{DS}=–10V, I_{D}=–2.5A	2	3		S
Static Drain-to-Source On-State Resistance	R_{DS}(on)1	I_{D}=–2.5A, V_{GS}=–10V		110	145	mΩ
	R_{DS}(on)2	I_{D}=–1A, V_{GS}=–4V		240	340	mΩ
Input Capacitance	Ciss	V_{DS}=–10V, f=1MHz		200		pF
Output Capacitance	Coss	V_{DS}=–10V, f=1MHz		47		pF
Reverse Transfer Capacitance	Crss	V_{DS}=–10V, f=1MHz		32		pF
Turn-ON Delay Time	t_{d}(on)	See specified Test Circuit.		7		ns
Rise Time	t_{r}	See specified Test Circuit.		3.5		ns
Turn-OFF Delay Time	t_{d}(off)	See specified Test Circuit.		20		ns
Fall Time	t_{f}	See specified Test Circuit.		8		ns
Total Gate Charge	Qg	V_{DS}=–10V, V_{GS}=–10V, I_{D}=–2.5A		5.5		nC
Gate-to-Source Charge	Qgs	V_{DS}=–10V, V_{GS}=–10V, I_{D}=–2.5A		0.98		nC
Gate-to-Drain “Miller” Charge	Qgd	V_{DS}=–10V, V_{GS}=–10V, I_{D}=–2.5A		0.82		nC
Diode Forward Voltage	V_{SD}	I_{S}=–2.5A, V_{GS}=0		–0.87	–1.5	V

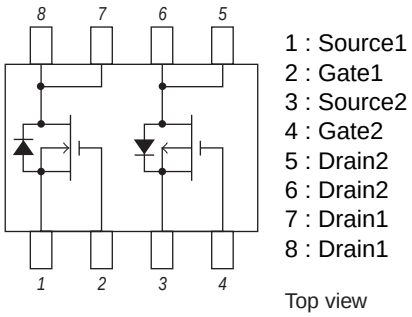
Package Dimensions

unit : mm

2129

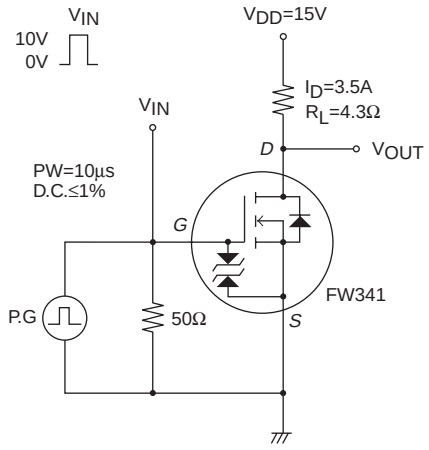


Electrical Connection

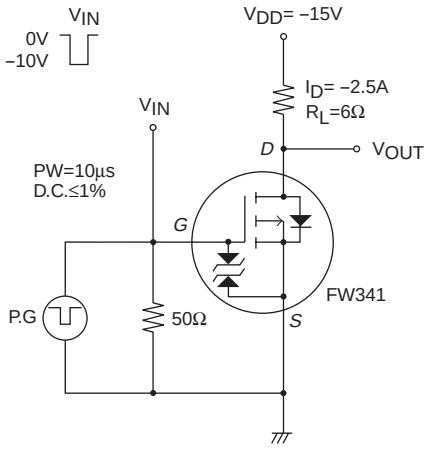


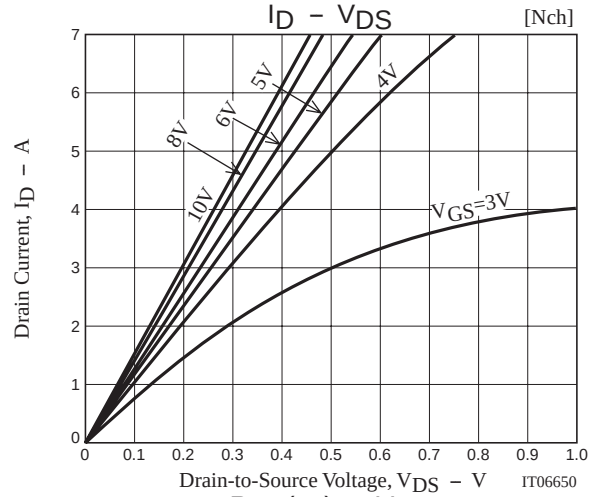
Switching Time Test Circuit

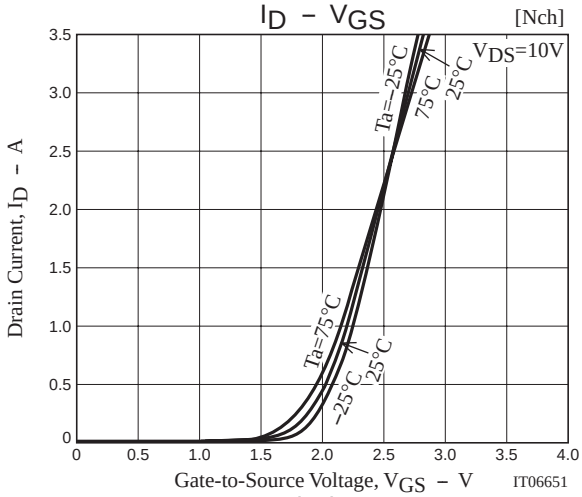
[N-channel]

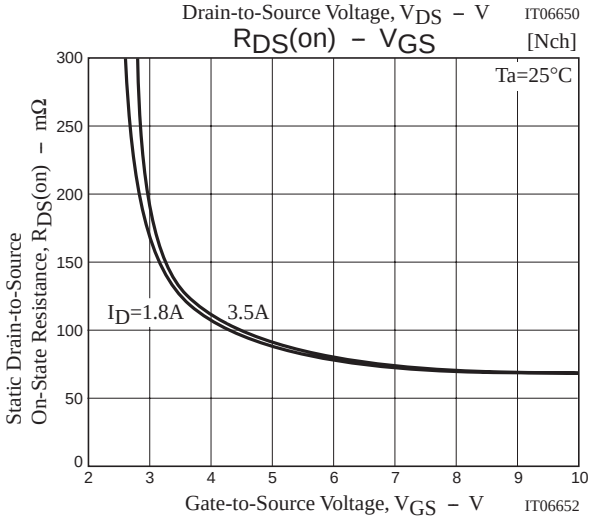


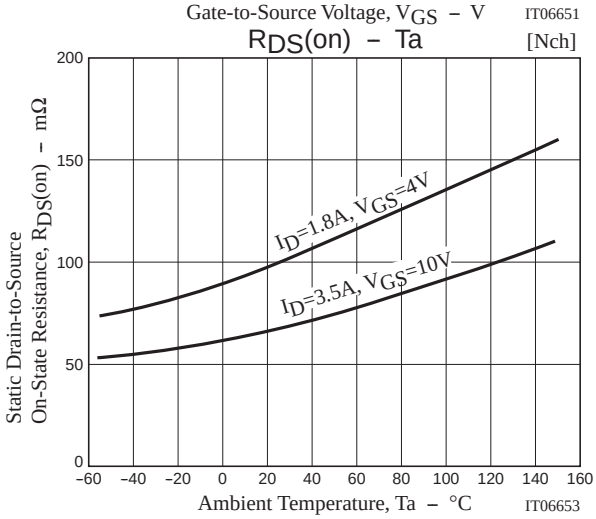
[P-channel]

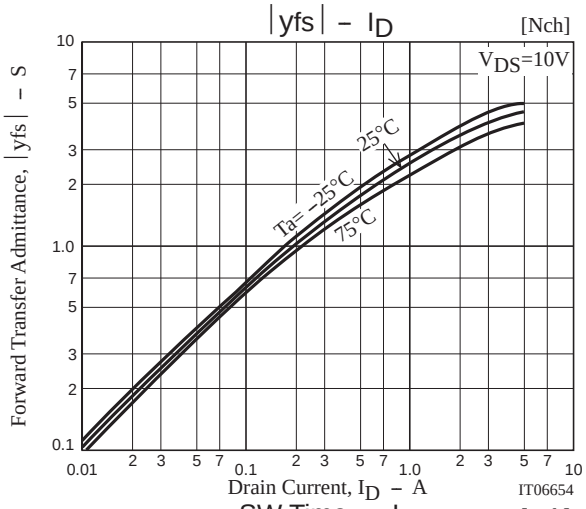


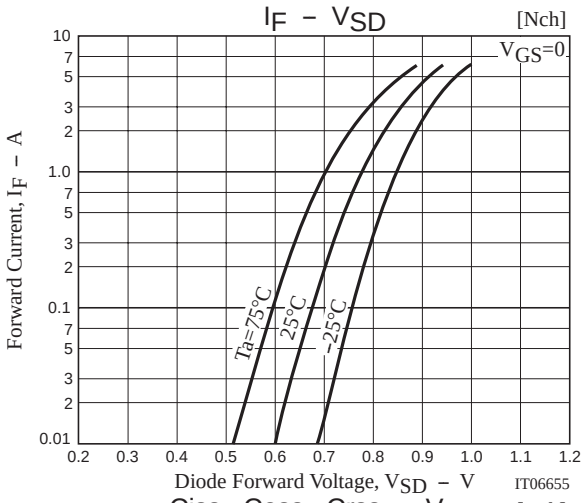


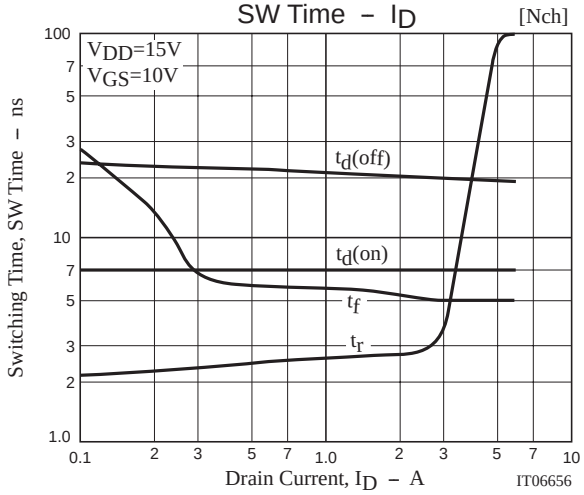


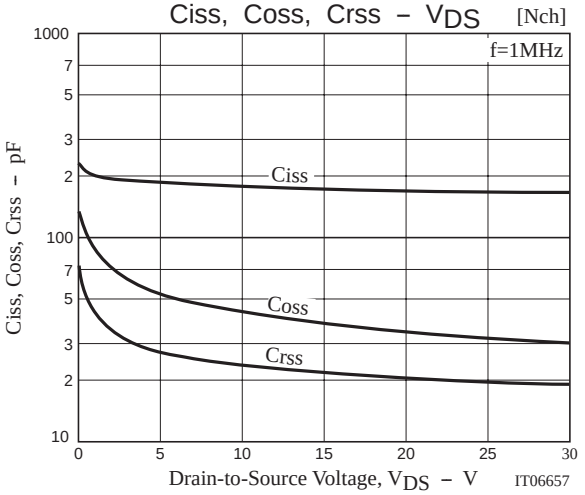


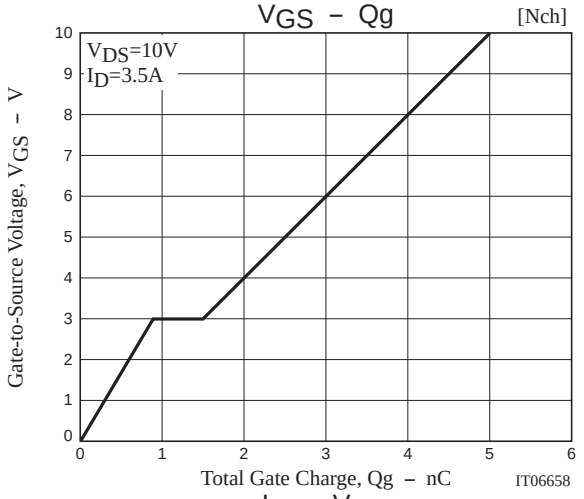


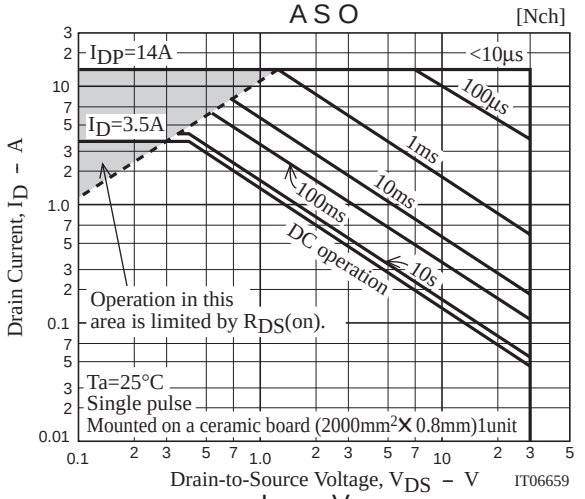

|yfs| – ID
[Nch]
VDS=10V
Ta= –25°C
25°C
75°C
Forward Transfer Admittance, |yfs| – S
Drain Current, ID – A
IT06654

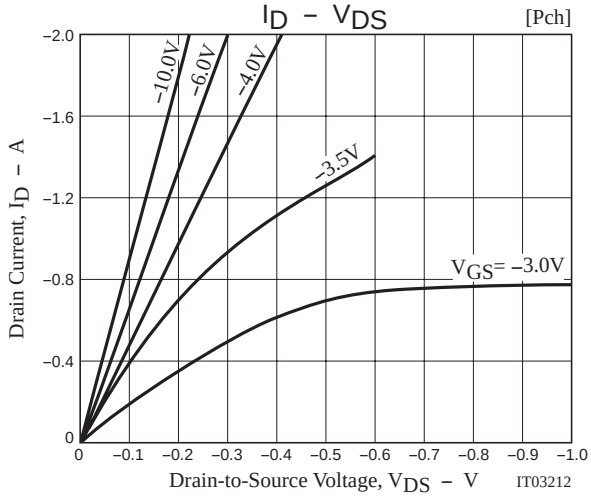

IF – VSD
[Nch]
VGS=0
Ta=75°C
25°C
–25°C
Forward Current, IF – A
Diode Forward Voltage, VSD – V
IT06655

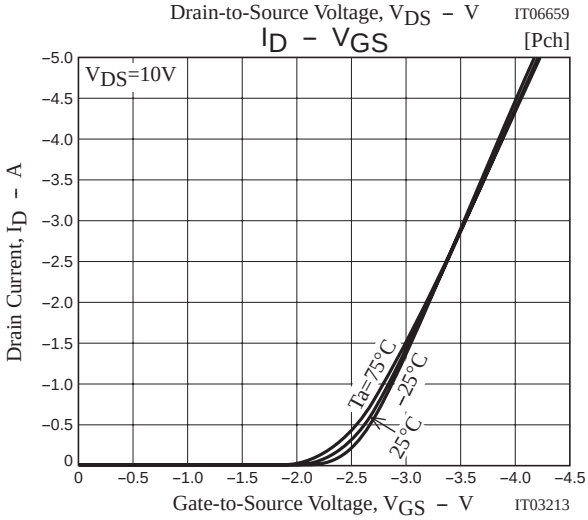

SW Time – ID
[Nch]
VDD=15V
VGS=10V
td(off)
td(on)
tf
tr
Switching Time, SW Time – ns
Drain Current, ID – A
IT06656

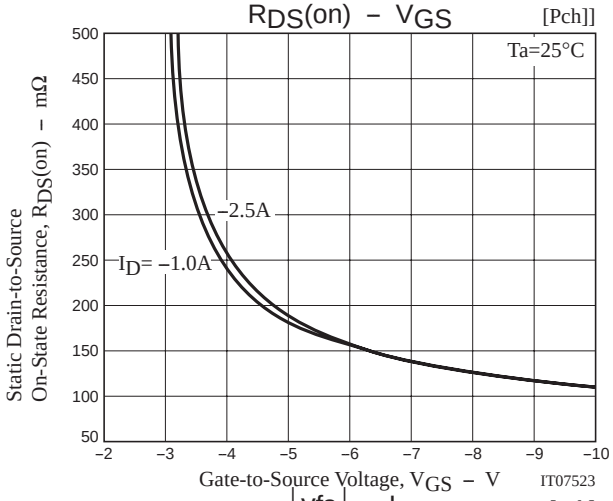

Ciss, Coss, Crss – VDS
[Nch]
f=1MHz
Ciss
Coss
Crss
Ciss, Coss, Crss – pF
Drain-to-Source Voltage, VDS – V
IT06657

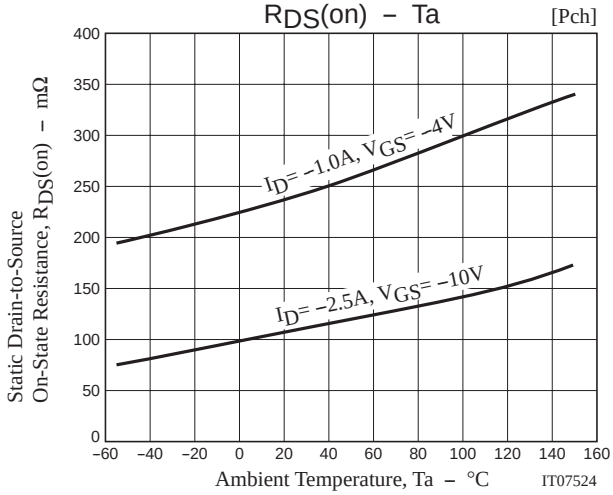

VGS – Qg
[Nch]
VDS=10V
ID=3.5A
Gate-to-Source Voltage, VGS – V
Total Gate Charge, Qg – nC
IT06658

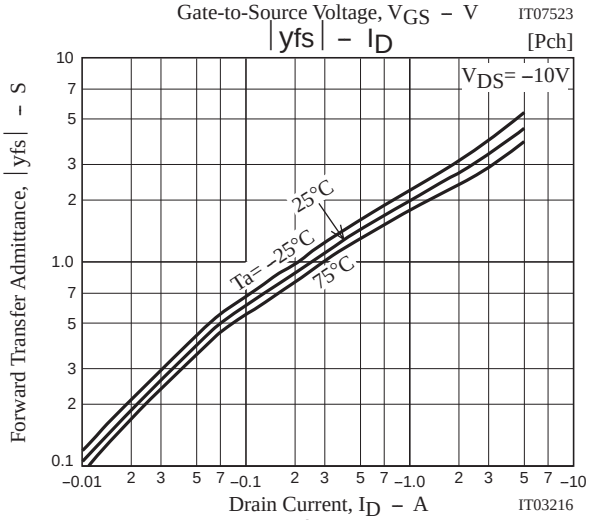

ASO
[Nch]
IDP=14A
ID=3.5A
<10μs
100μs
1ms
10ms
100ms
DC operation
10s
Operation in this
area is limited by RDS(on).
Ta=25°C
Single pulse
Mounted on a ceramic board (2000mm2✕0.8mm)1unit
Drain Current, ID – A
Drain-to-Source Voltage, VDS – V
IT06659

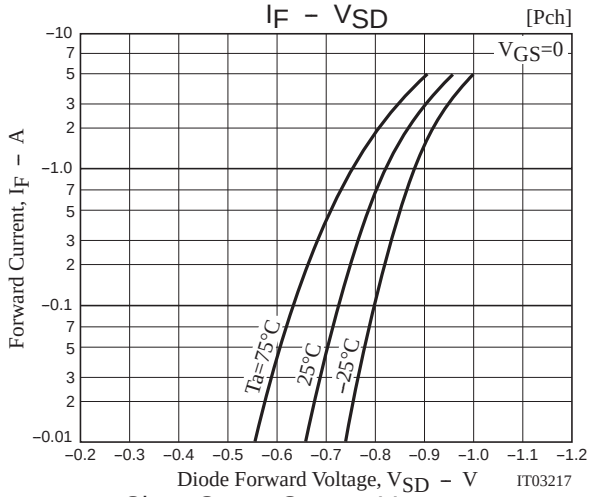

ID – VDS
[Pch]
–10.0V
–6.0V
–4.0V
–3.5V
VGS= –3.0V
Drain Current, ID – A
Drain-to-Source Voltage, VDS – V
IT03212

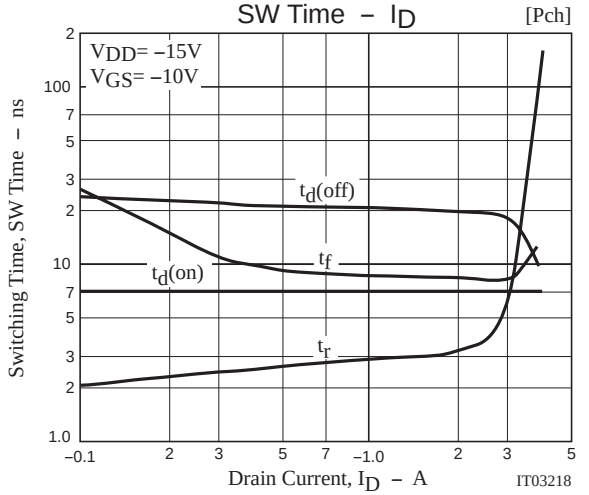

ID – VGS
[Pch]
VDS=10V
Ta=75°C
25°C
–25°C
Drain Current, ID – A
Gate-to-Source Voltage, VGS – V
IT03213

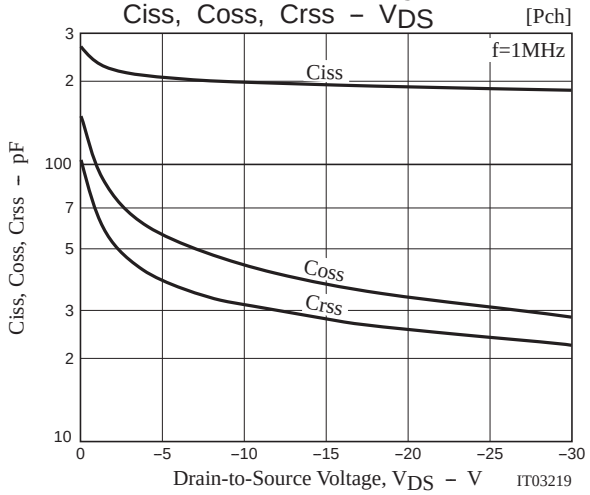

RDS(on) – VGS
[Pch]]
Ta=25°C
–2.5A
ID= –1.0A
Static Drain-to-Source On-State Resistance, RDS(on) – mΩ
Gate-to-Source Voltage, VGS – V
IT07523

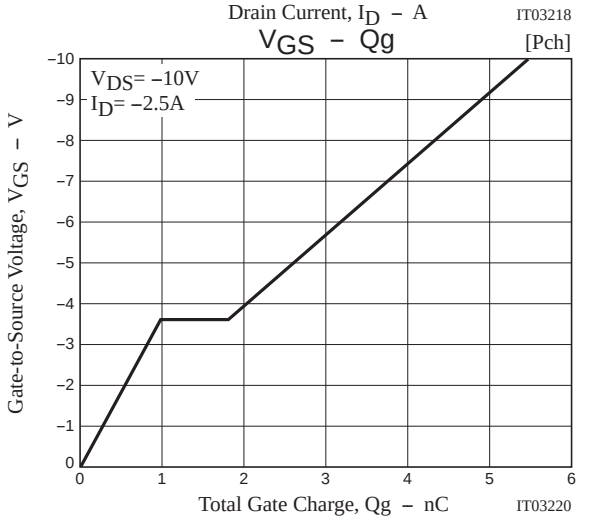

RDS(on) – Ta
[Pch]
ID= –1.0A, VGS= –4V
ID= –2.5A, VGS= –10V
Static Drain-to-Source On-State Resistance, RDS(on) – mΩ
Ambient Temperature, Ta – °C
IT07524

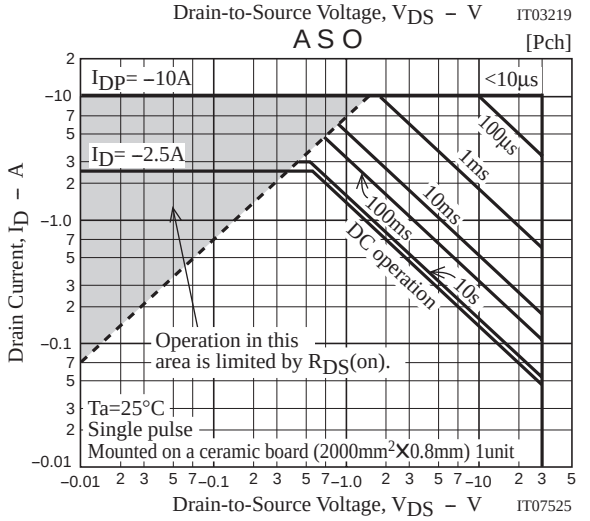

|yfs| – ID
[Pch]
VDS= –10V
25°C
Ta= –25°C
75°C
Forward Transfer Admittance, |yfs| – S
Drain Current, ID – A
IT03216

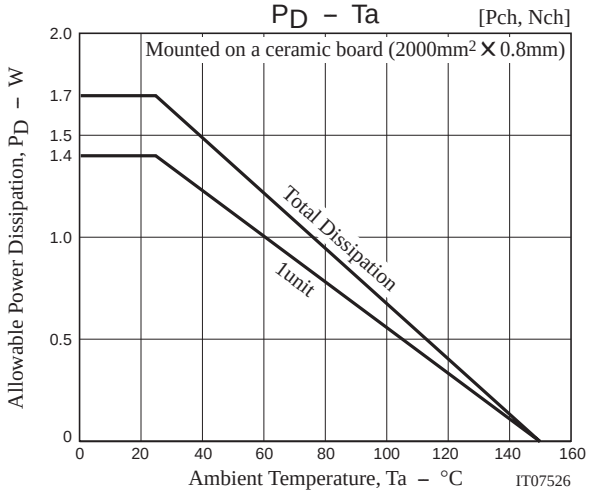

IF – VSD
[Pch]
VGS=0
Ta=75°C
25°C
–25°C
Forward Current, IF – A
Diode Forward Voltage, VSD – V
IT03217


SW Time – ID
[Pch]
VDD= –15V
VGS= –10V
td(off)
tf
td(on)
tr
Switching Time, SW Time – ns
Drain Current, ID – A
IT03218


Ciss, Coss, Crss – VDS
[Pch]
f=1MHz
Ciss
Coss
Crss
Ciss, Coss, Crss – pF
Drain-to-Source Voltage, VDS – V
IT03219


VGS – Qg
[Pch]
VDS= –10V
ID= –2.5A
Gate-to-Source Voltage, VGS – V
Total Gate Charge, Qg – nC
IT03220


A S O
[Pch]
IDP= –10A
ID= –2.5A
<10μs
100μs
1ms
10ms
100ms
DC operation
10s
Operation in this area is limited by RDS(on).
Ta=25°C
Single pulse
Mounted on a ceramic board (2000mm2×0.8mm) 1unit
Drain Current, ID – A
Drain-to-Source Voltage, VDS – V
IT07525



Note on usage : Since the FW341 is a MOSFET product, please avoid using this device in the vicinity of highly charged objects.

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