Ordering number : EN8998A

SANYO Semiconductors

DATA SHEET

An ON Semiconductor Company

N-Channel and P-Channel Silicon MOSFETs

FW344A — General-Purpose Switching Device Applications

Features

- ON-resistance Nch : $R_{DS}(on)1$=49mΩ(typ.)
  Pch : $R_{DS}(on)1$=78mΩ(typ.)
- 4V drive
- Halogen free compliance
- Nch+Pch MOSFET
- Protection diode in

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		4.5	−3.5	A
Drain Current (PW≤10μs)	I_{DP}	Duty cycle≤1%	5	−4	A
Drain Current (PW≤10μs)	I_{DP}	Duty cycle≤1%	18	−14	A
Allowable Power Dissipation	P_D	When mounted on ceramic substrate (900mm²×0.8mm) 1unit	1.4		W
Total Dissipation	P_T	When mounted on ceramic substrate (2000mm²×0.8mm)	1.7		W
Channel Temperature	Tch		150		°C
Storage Temperature	Tstg		−55 to +150		°C

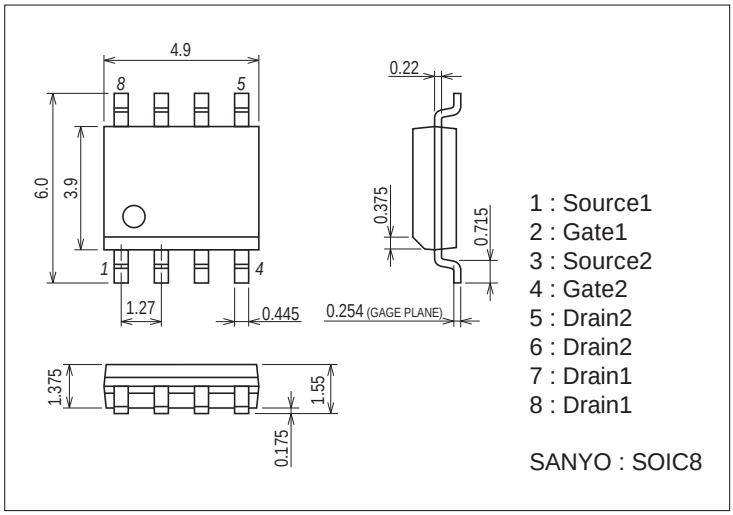
This product is designed to “ESD immunity < 200V*”, so please take care when handling.

* Machine Model

Package Dimensions

unit : mm (typ)

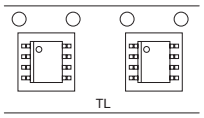
7072-001



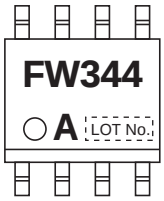
Product & Package Information

- Package : SOIC8
- JEITA, JEDEC : SC-87, SOT-96
- Minimum Packing Quantity : 2,500 pcs./reel

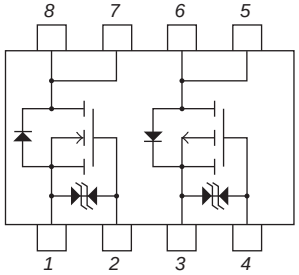
Packing Type : TL



Marking



Electrical Connection

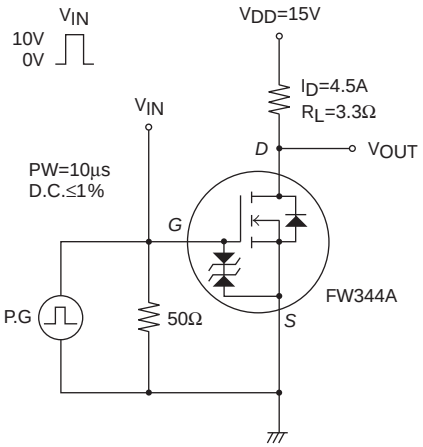


Electrical Characteristics at Ta=25°C

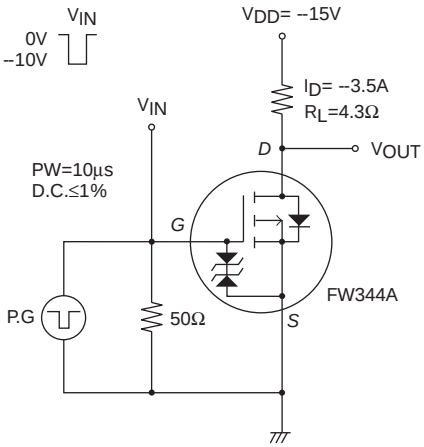
Parameter	Symbol	Conditions	Ratings			Unit
			min	typ	max	
[N-channel]						
Drain-to-Source Breakdown Voltage	$V_{(BR)DSS}$	I_D=1mA, V_{GS}=0V	30			V
Zero-Gate Voltage Drain Current	I_{DSS}	V_{DS}=30V, V_{GS}=0V			1	μA
Gate-to-Source Leakage Current	I_{GSS}	V_{GS}=±16V, V_{DS}=0V			±10	μA
Cutoff Voltage	V_{GS}(off)	V_{DS}=10V, I_D=1mA	1.2		2.6	V
Forward Transfer Admittance	| yfs |	V_{DS}=10V, I_D=4.5A		2.6		S
Static Drain-to-Source On-State Resistance	R_{DS}(on)1	I_D=4.5A, V_{GS}=10V		49	64	mΩ
	R_{DS}(on)2	I_D=2A, V_{GS}=4.5V		80	112	mΩ
	R_{DS}(on)3	I_D=2A, V_{GS}=4V		100	140	mΩ
Input Capacitance	Ciss	V_{DS}=10V, f=1MHz		280		pF
Output Capacitance	Coss			60		pF
Reverse Transfer Capacitance	Crss			30		pF
Turn-ON Delay Time	t_d(on)	See specified Test Circuit.		6		ns
Rise Time	t_r			21		ns
Turn-OFF Delay Time	t_d(off)			20		ns
Fall Time	t_f			10		ns
Total Gate Charge	Qg	V_{DS}=10V, V_{GS}=10V, I_D=4.5A		5.6		nC
Gate-to-Source Charge	Qgs			1.2		nC
Gate-to-Drain “Miller” Charge	Qgd			0.8		nC
Diode Forward Voltage	V_{SD}	I_S=4.5A, V_{GS}=0V		0.85	1.2	V
[P-channel]						
Drain-to-Source Breakdown Voltage	$V_{(BR)DSS}$	I_D=−1mA, V_{GS}=0V	−30			V
Zero-Gate Voltage Drain Current	I_{DSS}	V_{DS}=−30V, V_{GS}=0V			−1	μA
Gate-to-Source Leakage Current	I_{GSS}	V_{GS}=±16V, V_{DS}=0V			±10	μA
Cutoff Voltage	V_{GS}(off)	V_{DS}=−10V, I_D=−1mA	−1.2		−2.3	V
Forward Transfer Admittance	| yfs |	V_{DS}=−10V, I_D=−3.5A		3.9		S
Static Drain-to-Source On-State Resistance	R_{DS}(on)1	I_D=−3.5A, V_{GS}=−10V		78	102	mΩ
	R_{DS}(on)2	I_D=−2A, V_{GS}=−4.5V		125	175	mΩ
	R_{DS}(on)3	I_D=−2A, V_{GS}=−4V		145	205	mΩ
Input Capacitance	Ciss	V_{DS}=−10V, f=1MHz		250		pF
Output Capacitance	Coss			65		pF
Reverse Transfer Capacitance	Crss			46		pF
Turn-ON Delay Time	t_d(on)	See specified Test Circuit.		5.4		ns
Rise Time	t_r			34		ns
Turn-OFF Delay Time	t_d(off)			28		ns
Fall Time	t_f			24		ns
Total Gate Charge	Qg	V_{DS}=−10V, V_{GS}=−10V, I_D=−3.5A		5		nC
Gate-to-Source Charge	Qgs			1		nC
Gate-to-Drain “Miller” Charge	Qgd			1.2		nC
Diode Forward Voltage	V_{SD}	I_S=−3.5A, V_{GS}=0V		−0.88	−1.5	V

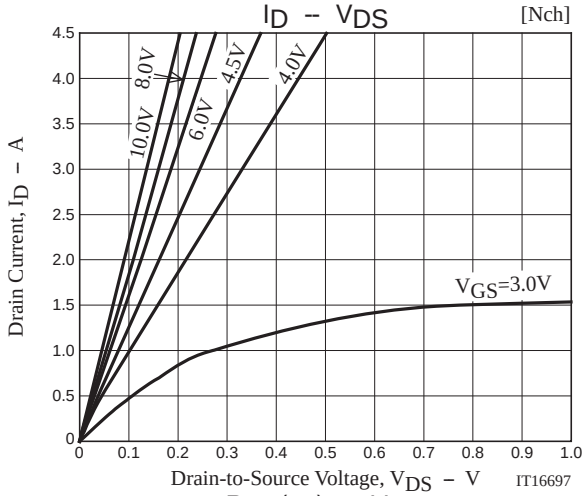
Switching Time Test Circuit

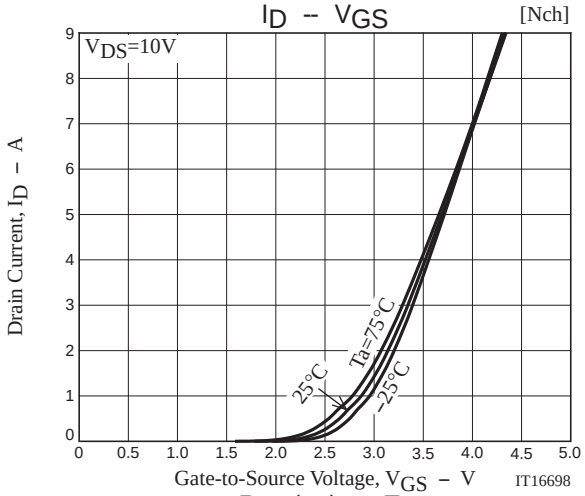
[N-channel]

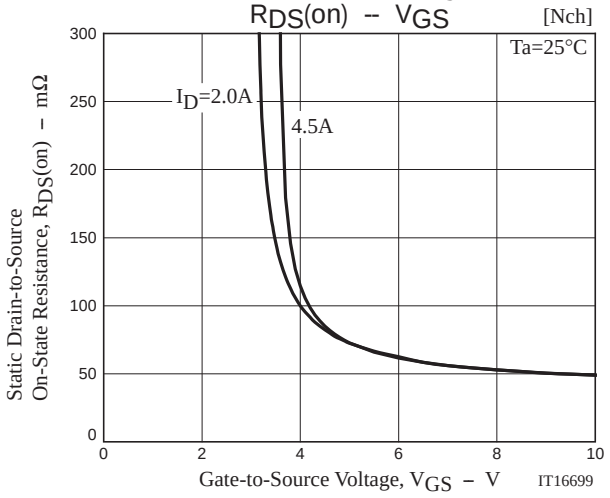


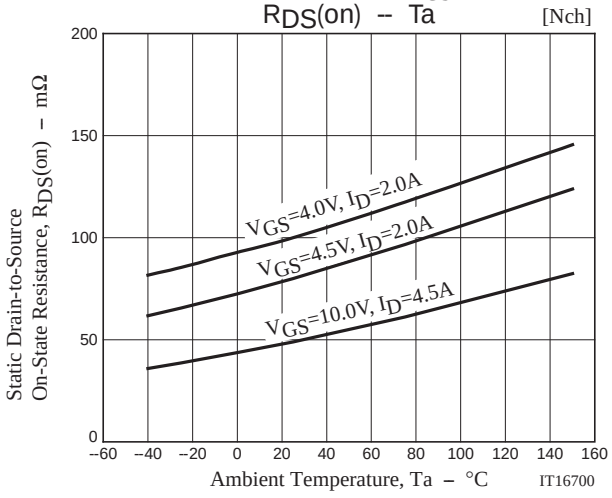
[P-channel]

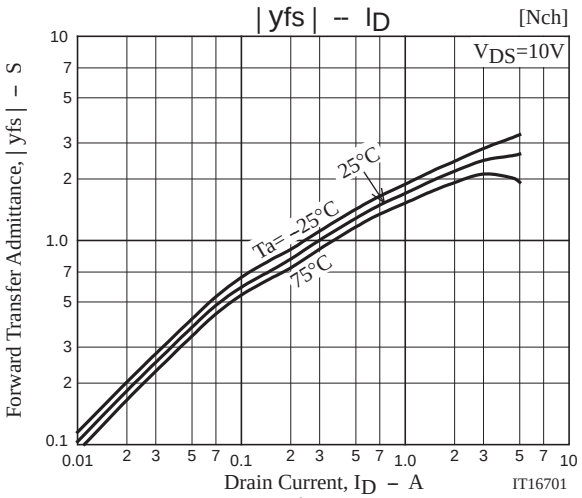


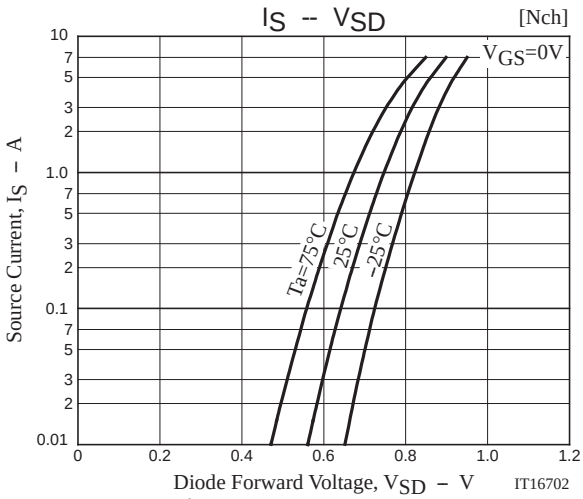


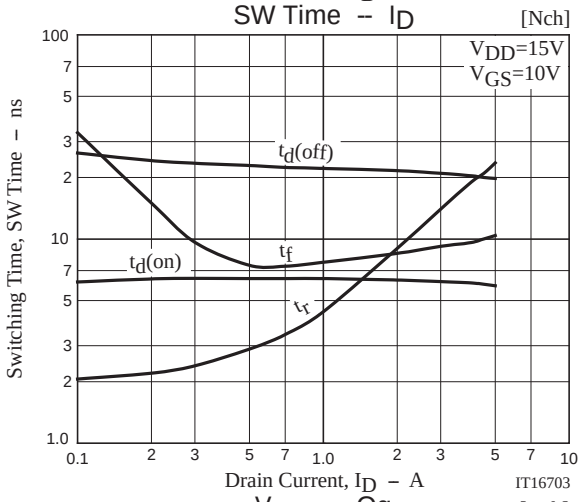


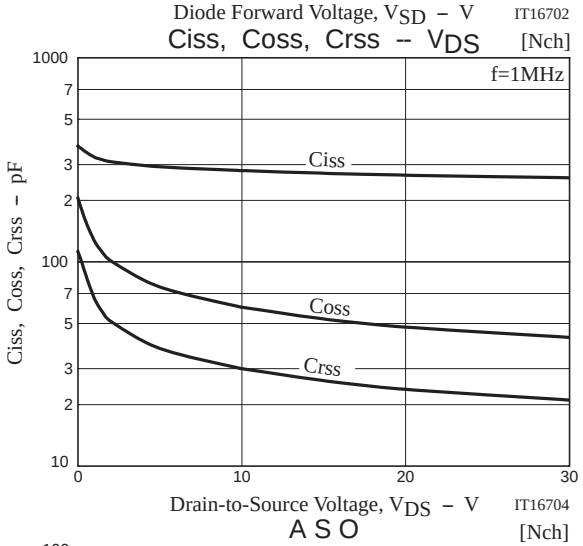


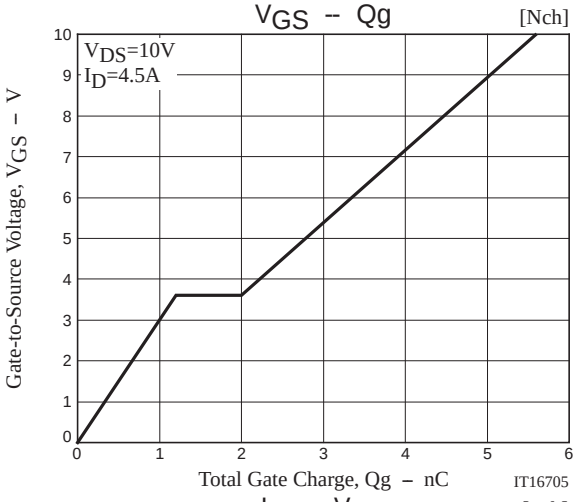


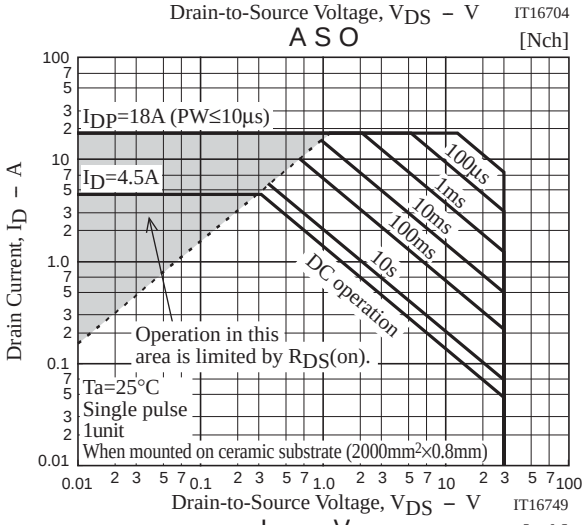

| yfs | -- ID
[Nch]
VDS=10V
Ta= –25°C
25°C
75°C
Forward Transfer Admittance, | yfs | – S
Drain Current, ID – A
IT16701

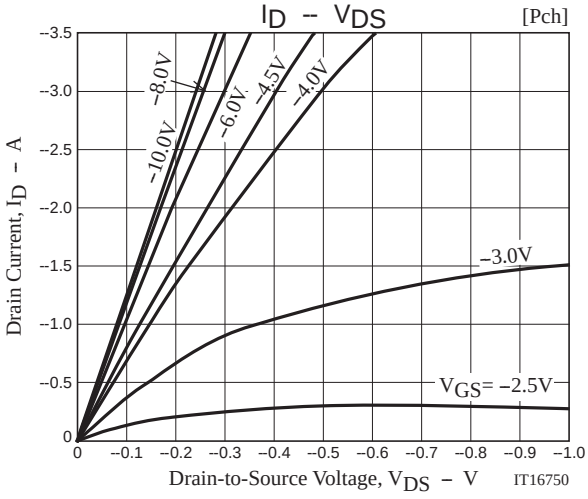

IS -- VSD
[Nch]
VGS=0V
Ta=75°C
25°C
–25°C
Source Current, IS – A
Diode Forward Voltage, VSD – V
IT16702

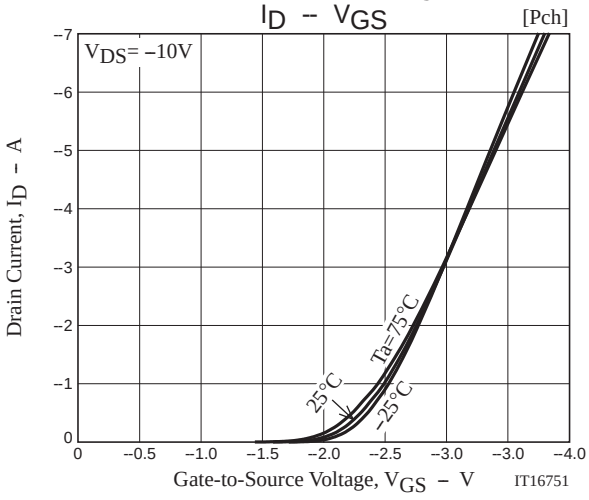

SW Time -- ID
[Nch]
VDD=15V
VGS=10V
td(off)
tf
td(on)
tr
Switching Time, SW Time – ns
Drain Current, ID – A
IT16703

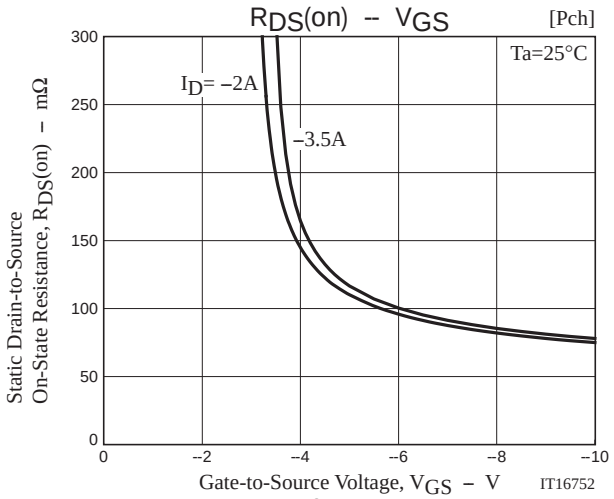

Ciss, Coss, Crss -- VDS
[Nch]
f=1MHz
Ciss
Coss
Crss
Ciss, Coss, Crss – pF
Drain-to-Source Voltage, VDS – V
IT16704

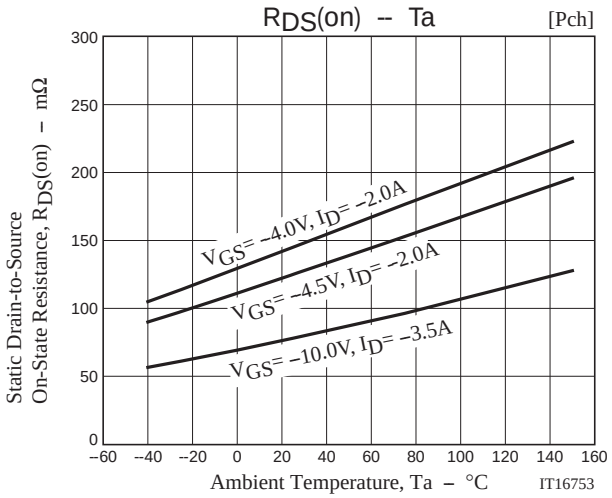

VGS -- Qg
[Nch]
VDS=10V
ID=4.5A
Gate-to-Source Voltage, VGS – V
Total Gate Charge, Qg – nC
IT16705

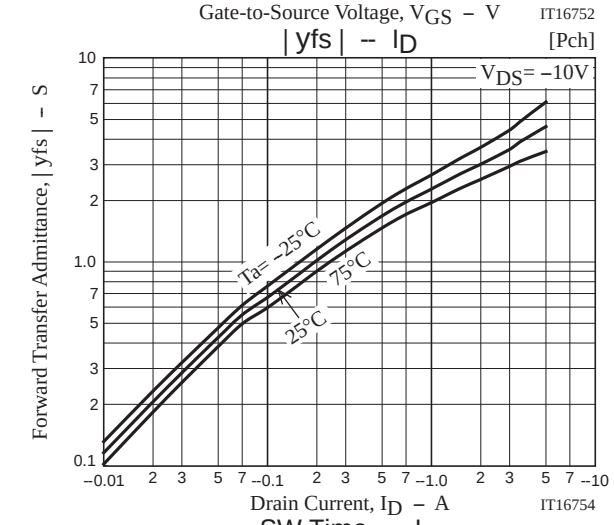

A S O
[Nch]
IDP=18A (PW≤10μs)
ID=4.5A
100μs
1ms
10ms
100ms
10s
DC operation
Operation in this
area is limited by RDS(on).
Ta=25°C
Single pulse
1unit
When mounted on ceramic substrate (2000mm2×0.8mm)
Drain Current, ID – A
Drain-to-Source Voltage, VDS – V
IT16749

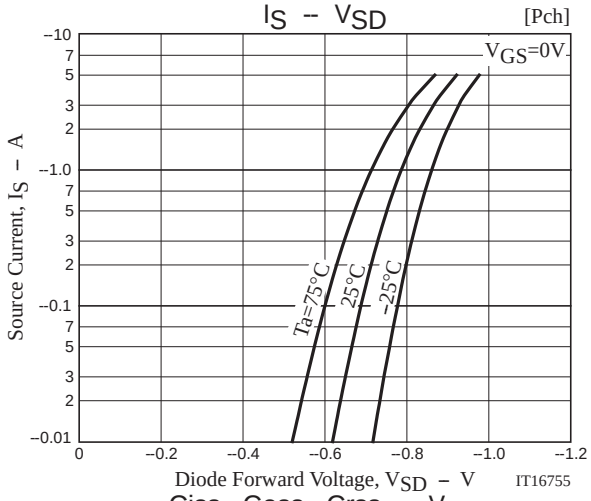

ID -- VDS
[Pch]
–8.0V
–10.0V
–6.0V
–4.5V
–4.0V
–3.0V
VGS= –2.5V
Drain Current, ID – A
Drain-to-Source Voltage, VDS – V
IT16750

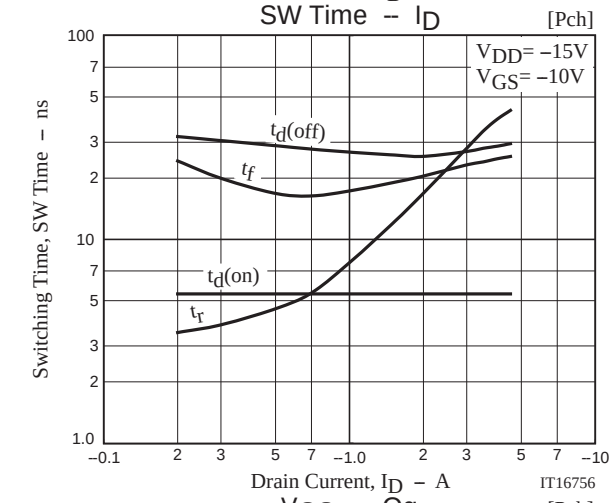

ID -- VGS
[Pch]
VDS= –10V
25°C
Ta=75°C
–25°C
Drain Current, ID – A
Gate-to-Source Voltage, VGS – V
IT16751

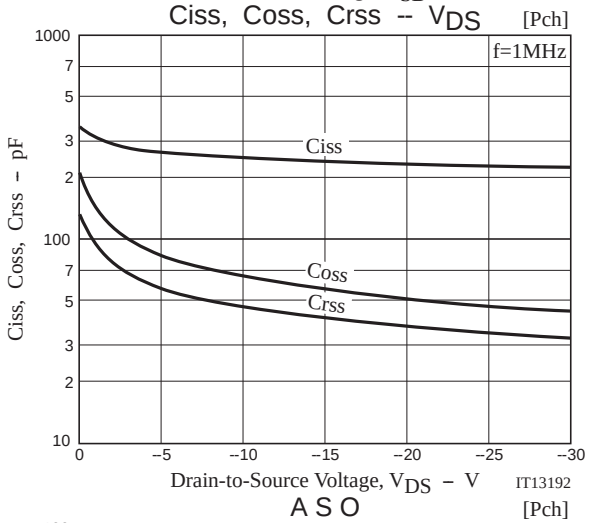

RDS(on) -- VGS
[Pch]
Ta=25°C
ID= –2A
–3.5A
Static Drain-to-Source On-State Resistance, RDS(on) – mΩ
Gate-to-Source Voltage, VGS – V
IT16752

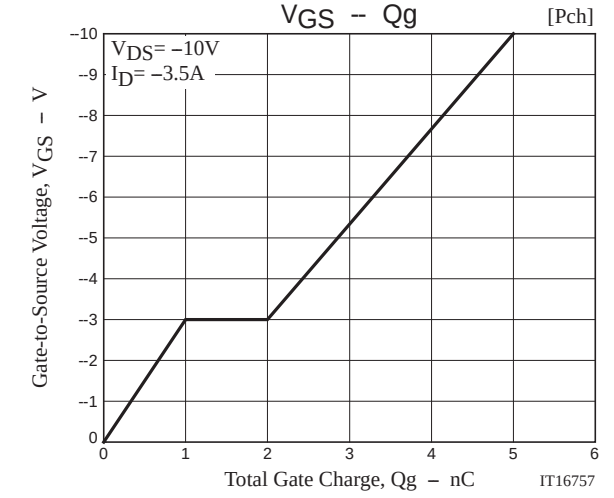

RDS(on) -- Ta
[Pch]
VGS= –4.0V, ID= –2.0A
VGS= –4.5V, ID= –2.0A
VGS= –10.0V, ID= –3.5A
Static Drain-to-Source On-State Resistance, RDS(on) – mΩ
Ambient Temperature, Ta – °C
IT16753

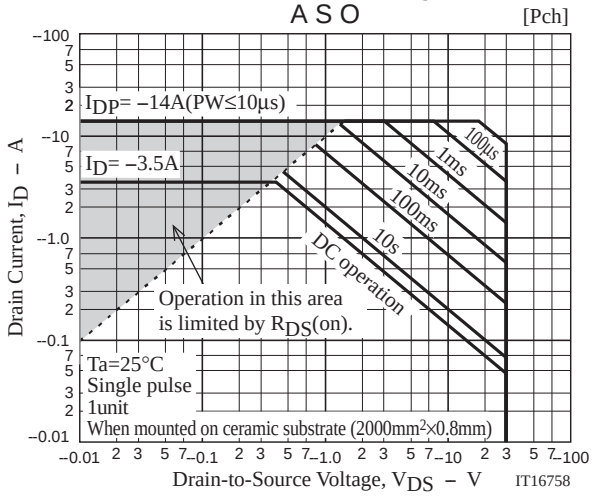

| yfs | -- ID
[Pch]
VDS= –10V
Ta= –25°C
75°C
25°C
Forward Transfer Admittance, | yfs | – S
Drain Current, ID – A
IT16754

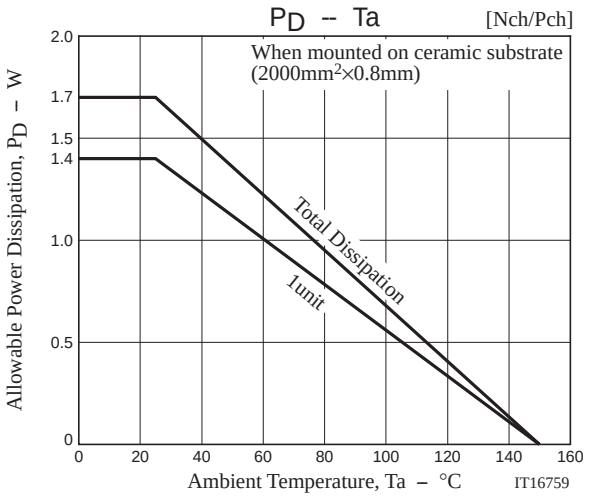

IS -- VSD
[Pch]
VGS=0V
Ta=75°C
25°C
–25°C
Source Current, IS – A
Diode Forward Voltage, VSD – V
IT16755

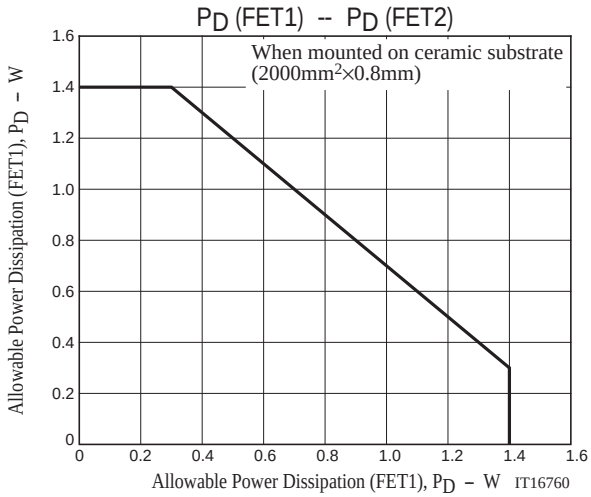

SW Time -- ID
[Pch]
VDD= –15V
VGS= –10V
td(off)
tf
td(on)
tr
Switching Time, SW Time – ns
Drain Current, ID – A
IT16756


Ciss, Coss, Crss -- VDS
[Pch]
f=1MHz
Ciss
Coss
Crss
Ciss, Coss, Crss – pF
Drain-to-Source Voltage, VDS – V
IT13192


VGS -- Qg
[Pch]
VDS= –10V
ID= –3.5A
Gate-to-Source Voltage, VGS – V
Total Gate Charge, Qg – nC
IT16757


A S O
[Pch]
IDP= –14A(PW≤10μs)
ID= –3.5A
100μs
1ms
10ms
100ms
10s
DC operation
Operation in this area is limited by RDS(on).
Ta=25°C
Single pulse
1unit
When mounted on ceramic substrate (2000mm²×0.8mm)
Drain Current, ID – A
Drain-to-Source Voltage, VDS – V
IT16758





Note on usage : Since the FW344A is a MOSFET product, please avoid using this device in the vicinity of highly charged objects.

- Any and all SANYO Semiconductor Co.,Ltd. products described or contained herein are, with regard to "standard application", intended for the use as general electronics equipment. The products mentioned herein shall not be intended for use for any "special application" (medical equipment whose purpose is to sustain life, aerospace instrument, nuclear control device, burning appliances, transportation machine, traffic signal system, safety equipment etc.) that shall require extremely high level of reliability and can directly threaten human lives in case of failure or malfunction of the product or may cause harm to human bodies, nor shall they grant any guarantee thereof. If you should intend to use our products for new introduction or other application different from current conditions on the usage of automotive device, communication device, office equipment, industrial equipment etc. , please consult with us about usage condition (temperature, operation time etc.) prior to the intended use. If there is no consultation or inquiry before the intended use, our customer shall be solely responsible for the use.
- Specifications of any and all SANYO Semiconductor Co.,Ltd. products described or contained herein stipulate the performance, characteristics, and functions of the described products in the independent state, and are not guarantees of the performance, characteristics, and functions of the described products as mounted in the customer's products or equipment. To verify symptoms and states that cannot be evaluated in an independent device, the customer should always evaluate and test devices mounted in the customer's products or equipment.
- SANYO Semiconductor Co.,Ltd. assumes no responsibility for equipment failures that result from using products at values that exceed, even momentarily, rated values (such as maximum ratings, operating condition ranges, or other parameters) listed in products specifications of any and all SANYO Semiconductor Co.,Ltd. products described or contained herein.
- SANYO Semiconductor Co.,Ltd. strives to supply high-quality high-reliability products, however, any and all semiconductor products fail or malfunction with some probability. It is possible that these probabilistic failures or malfunction could give rise to accidents or events that could endanger human lives, trouble that could give rise to smoke or fire, or accidents that could cause damage to other property. When designing equipment, adopt safety measures so that these kinds of accidents or events cannot occur. Such measures include but are not limited to protective circuits and error prevention circuits for safe design, redundant design, and structural design.
- In the event that any or all SANYO Semiconductor Co.,Ltd. products described or contained herein are controlled under any of applicable local export control laws and regulations, such products may require the export license from the authorities concerned in accordance with the above law.
- No part of this publication may be reproduced or transmitted in any form or by any means, electronic or mechanical, including photocopying and recording, or any information storage or retrieval system, or otherwise, without the prior written consent of SANYO Semiconductor Co.,Ltd.
- Any and all information described or contained herein are subject to change without notice due to product/technology improvement, etc. When designing equipment, refer to the "Delivery Specification" for the SANYO Semiconductor Co.,Ltd. product that you intend to use.
- Upon using the technical information or products described herein, neither warranty nor license shall be granted with regard to intellectual property rights or any other rights of SANYO Semiconductor Co.,Ltd. or any third party. SANYO Semiconductor Co.,Ltd. shall not be liable for any claim or suits with regard to a third party's intellectual property rights which has resulted from the use of the technical information and products mentioned above.

This catalog provides information as of March, 2012. Specifications and information herein are subject to change without notice.