Ordering number : ENA0656

SANYO Semiconductors
DATA SHEET

N-Channel and P-Channel Silicon MOSFETs

VEC2612 — General-Purpose Switching Device Applications

Features

- The best suited for inverter applications.
- The VEC2612 incorporates an N-channel MOSFET and a P-channel MOSFET that feature low ON-resistance, thereby enabling high-density mounting.
- 4V drive.
- Mounting height 0.75mm.

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	−3	A
Drain Current (Pulse)	I_{DP}	PW≤10μs, duty cycle≤1%	12	−12	A
Allowable Power Dissipation	P_D	Mounted on a ceramic board (900mm²X0.8mm)1unit	0.9		W
Total Dissipation	P_T	Mounted on a ceramic board (900mm²X0.8mm)	1.0		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	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=1.5A	1.8	3.0		S
Static Drain-to-Source On-State Resistance	$R_{DS}(on)1$	I_D=1.5A, V_{GS}=10V		73	95	mΩ
	$R_{DS}(on)2$	I_D=1A, V_{GS}=4V		115	161	mΩ
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

Marking : CR

Continued on next page.

■ Any and all SANYO Semiconductor products described or contained herein do not have specifications that can handle applications that require extremely high levels of reliability, such as life-support systems, aircraft's control systems, or other applications whose failure can be reasonably expected to result in serious physical and/or material damage. Consult with your SANYO Semiconductor representative nearest you before using any SANYO Semiconductor products described or contained herein in such applications.

■ SANYO Semiconductor 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 products described or contained herein.

SANYO Semiconductor Co., Ltd.
TOKYO OFFICE Tokyo Bldg., 1-10, 1 Chome, Ueno, Taito-ku, TOKYO, 110-8534 JAPAN

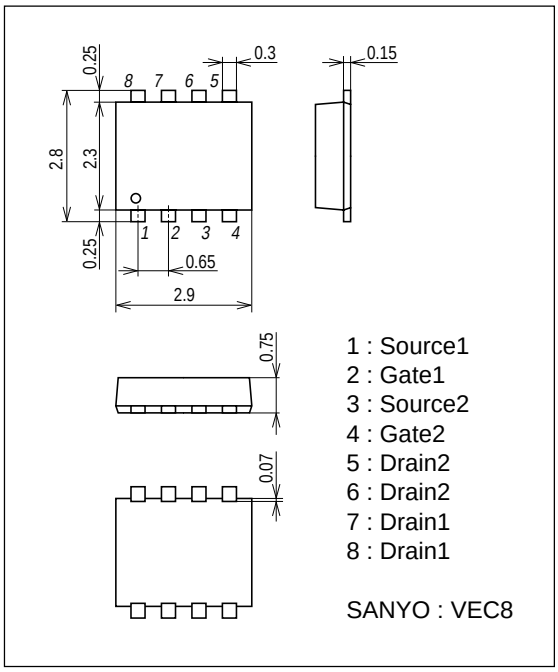
Continued from preceding page.

Parameter	Symbol	Conditions	Ratings			Unit
			min	typ	max	
Turn-ON Delay Time	$t_{d(on)}$	See specified Test Circuit.		7		ns
Rise Time	t_r	See specified Test Circuit.		2.8		ns
Turn-OFF Delay Time	$t_{d(off)}$	See specified Test Circuit.		18.5		ns
Fall Time	t_f	See specified Test Circuit.		4.4		ns
Total Gate Charge	Qg	V_{DS}=10V, V_{GS}=10V, I_D=3A		4.9		nC
Gate-to-Source Charge	Qgs	V_{DS}=10V, V_{GS}=10V, I_D=3A		0.93		nC
Gate-to-Drain “Miller” Charge	Qgd	V_{DS}=10V, V_{GS}=10V, I_D=3A		0.93		nC
Diode Forward Voltage	V_{SD}	I_S=3A, 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	−1.0		−2.4	V
Forward Transfer Admittance	$\|yfs\|$	V_{DS}=−10V, I_D=−1.5A	2.0	3.4		S
Static Drain-to-Source On-State Resistance	$R_{DS(on)1}$	I_D=−1.5A, V_{GS}=−10V		65	86	mΩ
	$R_{DS(on)2}$	I_D=−1A, V_{GS}=−4V		117	168	mΩ
Input Capacitance	Ciss	V_{DS}=−10V, f=1MHz		510		pF
Output Capacitance	Coss	V_{DS}=−10V, f=1MHz		115		pF
Reverse Transfer Capacitance	Crss	V_{DS}=−10V, f=1MHz		78		pF
Turn-ON Delay Time	$t_{d(on)}$	See specified Test Circuit.		11		ns
Rise Time	t_r	See specified Test Circuit.		17		ns
Turn-OFF Delay Time	$t_{d(off)}$	See specified Test Circuit.		53		ns
Fall Time	t_f	See specified Test Circuit.		35		ns
Total Gate Charge	Qg	V_{DS}=−10V, V_{GS}=−10V, I_D=−3A		11		nC
Gate-to-Source Charge	Qgs	V_{DS}=−10V, V_{GS}=−10V, I_D=−3A		2.4		nC
Gate-to-Drain “Miller” Charge	Qgd	V_{DS}=−10V, V_{GS}=−10V, I_D=−3A		1.7		nC
Diode Forward Voltage	V_{SD}	I_S=−3A, V_{GS}=0V		−0.87	−1.2	V

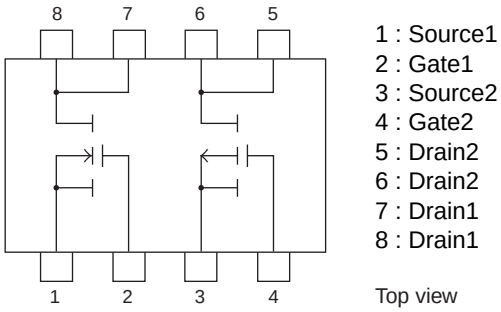
Package Dimensions

unit : mm (typ)

7012-002

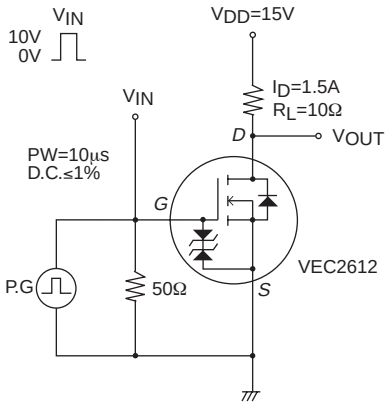


Electrical Connection

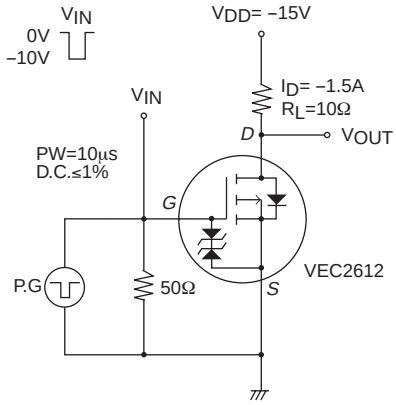


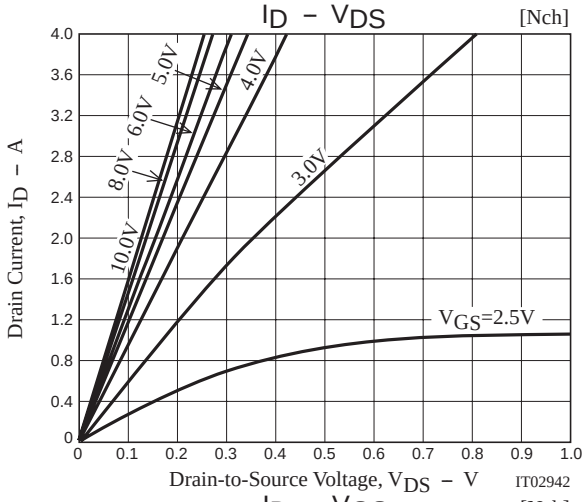
Switching Time Test Circuit

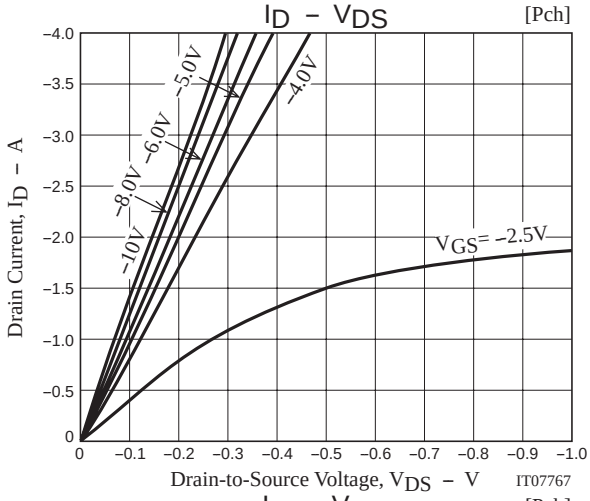
[N-channel]

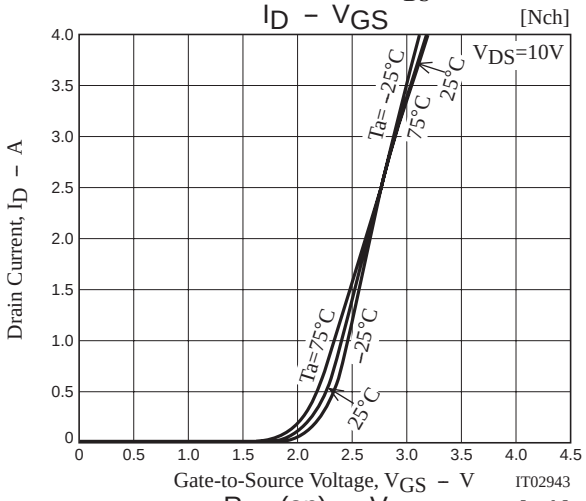


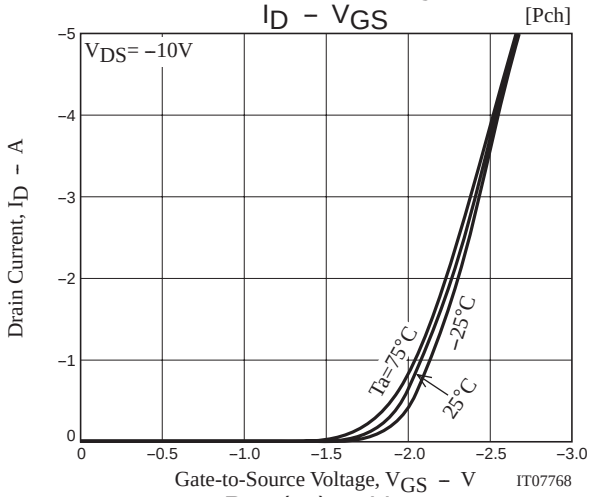
[P-channel]

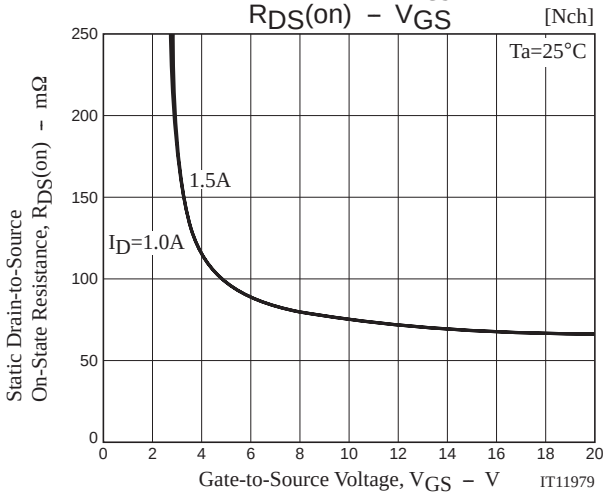


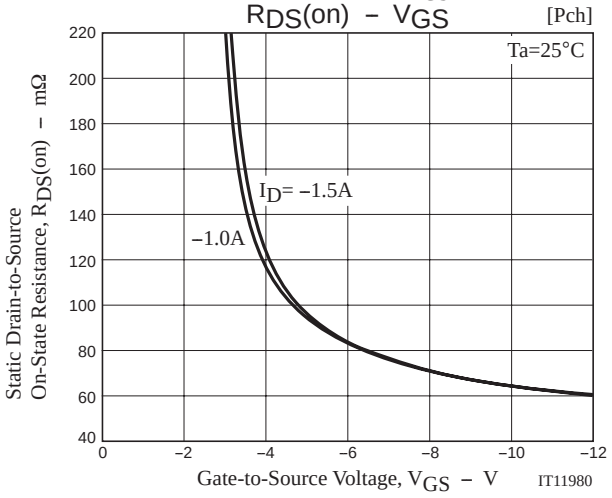


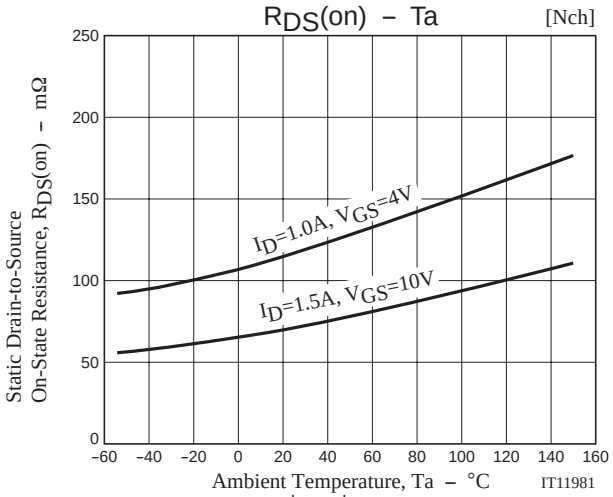


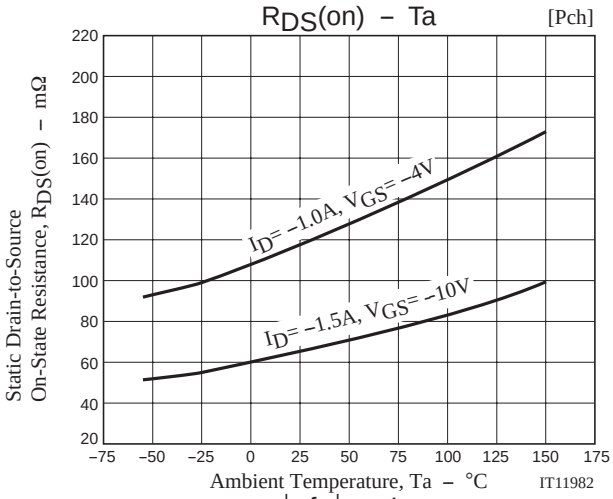


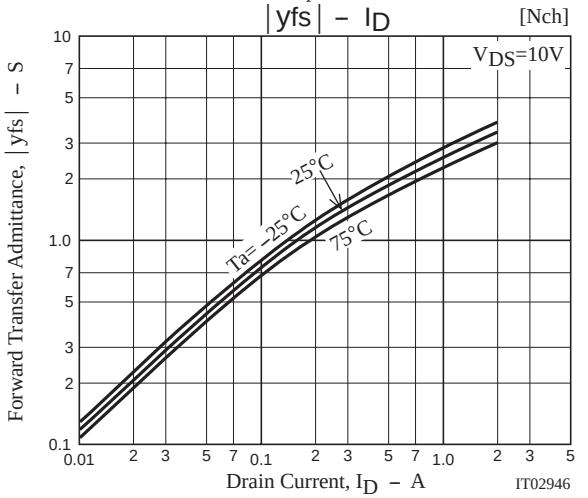


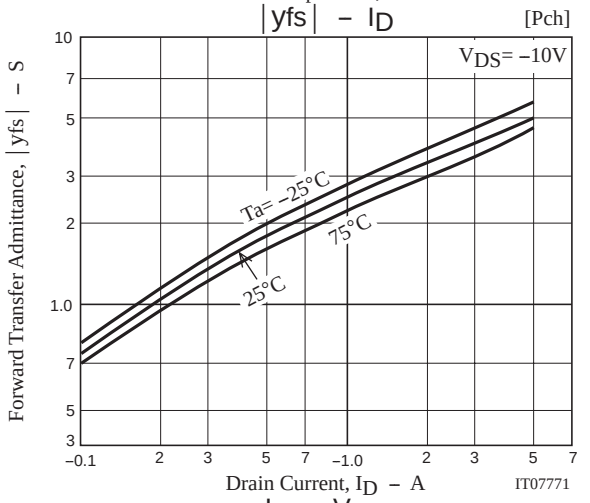


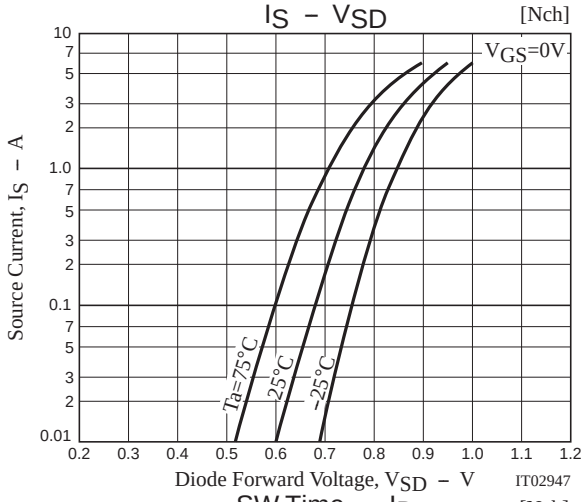


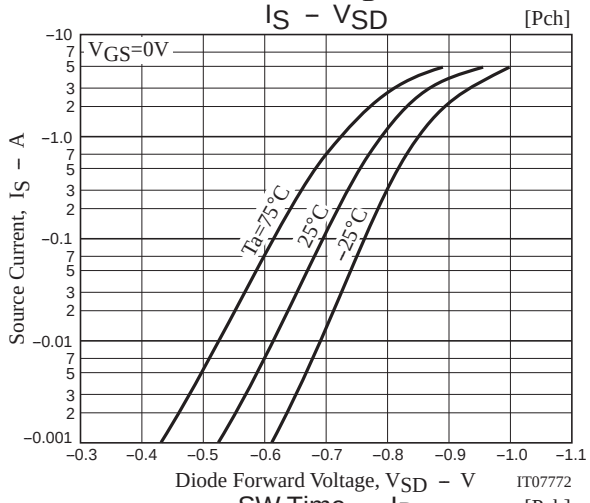

RDS(on) – Ta
[Nch]
Static Drain-to-Source On-State Resistance, RDS(on) – mΩ
ID=1.0A, VGS=4V
ID=1.5A, VGS=10V
Ambient Temperature, Ta – °C
IT11981

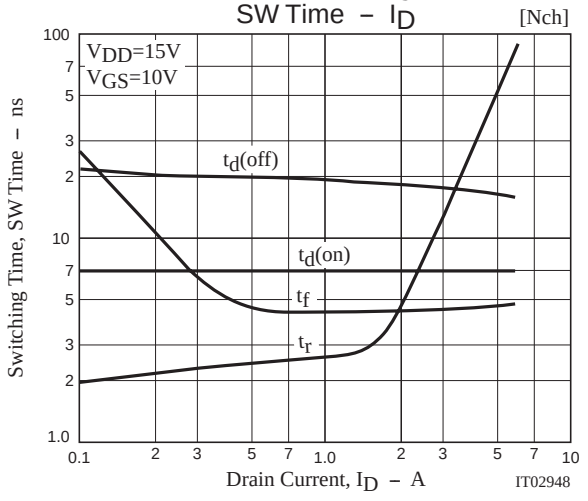

RDS(on) – Ta
[Pch]
Static Drain-to-Source On-State Resistance, RDS(on) – mΩ
ID= –1.0A, VGS= –4V
ID= –1.5A, VGS= –10V
Ambient Temperature, Ta – °C
IT11982

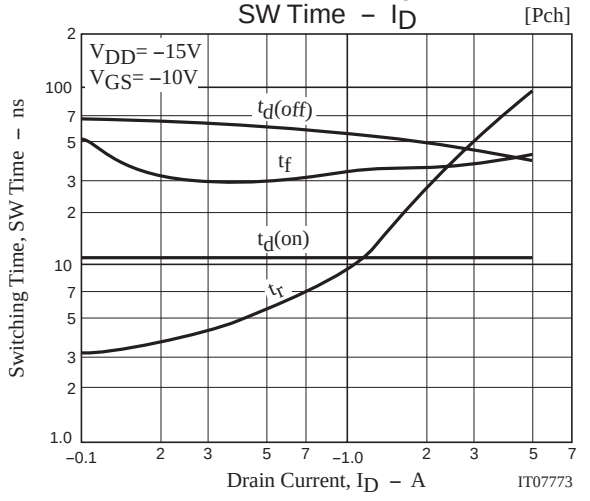

|yfs| – ID
[Nch]
VDS=10V
Forward Transfer Admittance, |yfs| – S
25°C
Ta= –25°C
75°C
Drain Current, ID – A
IT02946


|yfs| – ID
[Pch]
VDS= –10V
Forward Transfer Admittance, |yfs| – S
Ta= –25°C
75°C
25°C
Drain Current, ID – A
IT07771

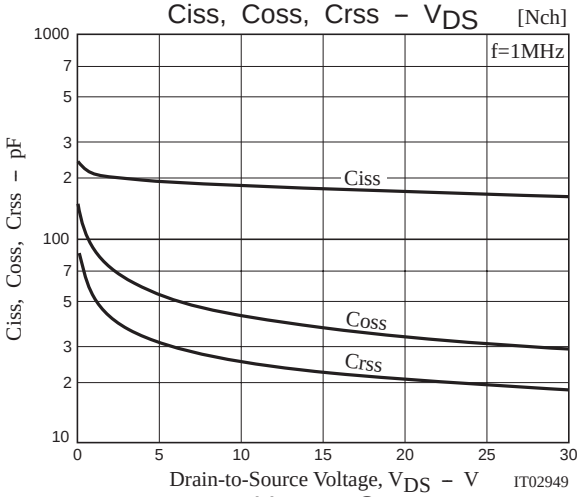

IS – VSD
[Nch]
VGS=0V
Source Current, IS – A
Ta=75°C
25°C
–25°C
Diode Forward Voltage, VSD – V
IT02947


IS – VSD
[Pch]
VGS=0V
Source Current, IS – A
Ta=75°C
25°C
–25°C
Diode Forward Voltage, VSD – V
IT07772

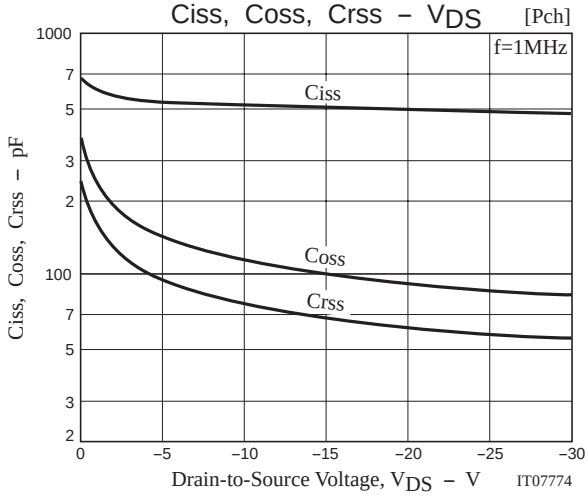

SW Time – ID
[Nch]
VDD=15V
VGS=10V
Switching Time, SW Time – ns
td(off)
td(on)
tf
tr
Drain Current, ID – A
IT02948


SW Time – ID
[Pch]
VDD= –15V
VGS= –10V
Switching Time, SW Time – ns
td(off)
tf
td(on)
tr
Drain Current, ID – A
IT07773

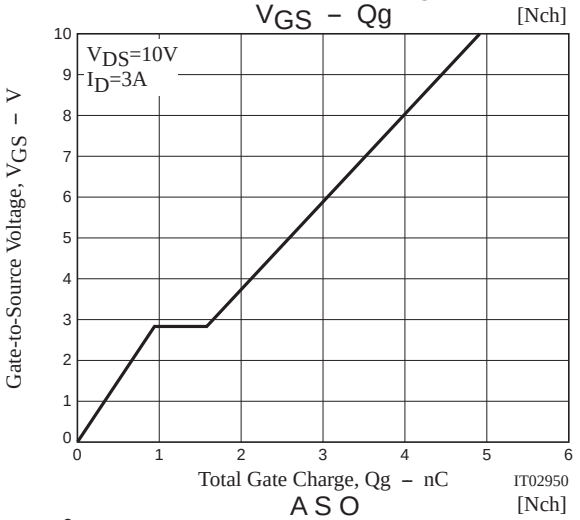
Ciss, Coss, Crss – V_{DS} [Nch]



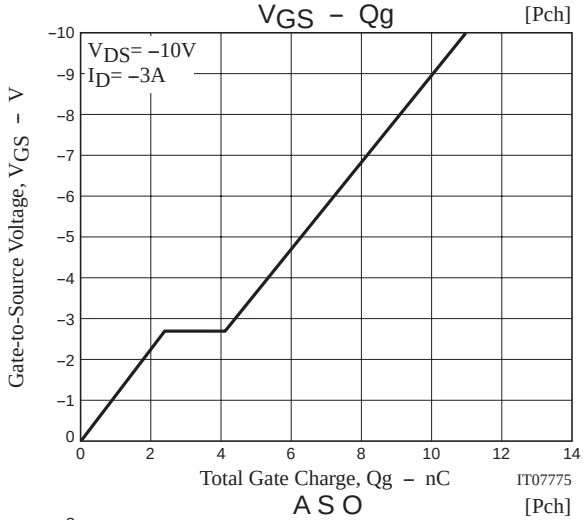
Ciss, Coss, Crss – V_{DS} [Pch]



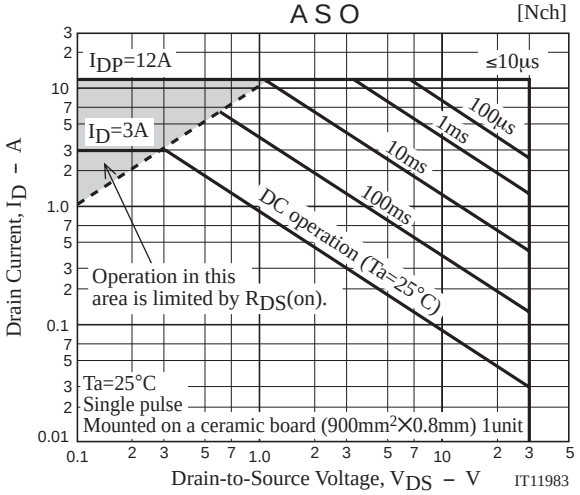
V_{GS} – Qg [Nch]



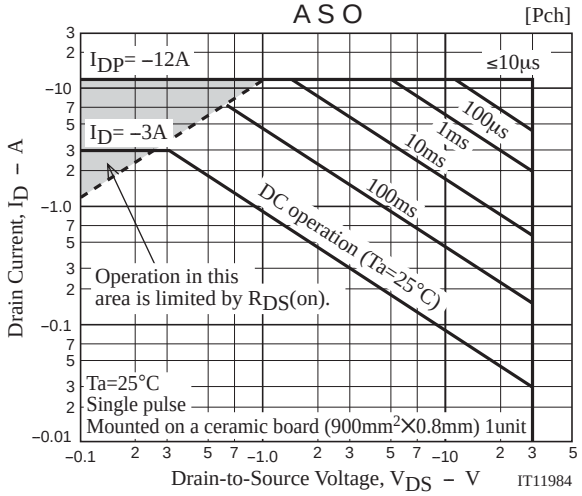
V_{GS} – Qg [Pch]



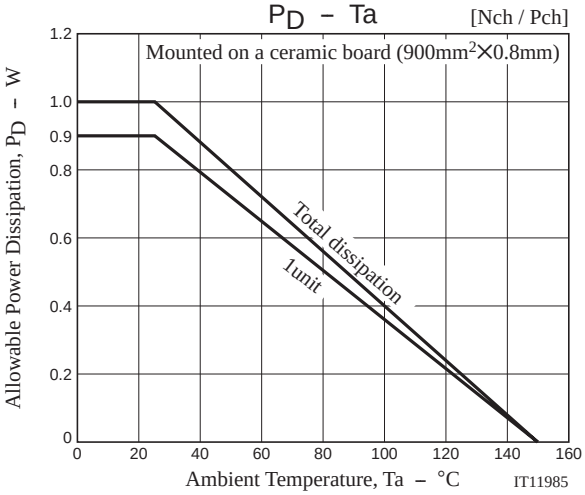
A S O [Nch]



A S O [Pch]



P_D – Ta [Nch / Pch]



Note on usage : Since the VEC2612 is a MOSFET product, please avoid using this device in the vicinity of highly charged objects.

- Specifications of any and all SANYO Semiconductor 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. strives to supply high-quality high-reliability products. However, any and all semiconductor products fail with some probability. It is possible that these probabilistic failures could give rise to accidents or events that could endanger human lives, that could give rise to smoke or fire, or 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 products (including technical data,services) described or contained herein are controlled under any of applicable local export control laws and regulations, such products must not be exported without obtaining 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 permission 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 product that you intend to use.
- Information (including circuit diagrams and circuit parameters) herein is for example only; it is not guaranteed for volume production. SANYO Semiconductor believes information herein is accurate and reliable, but no guarantees are made or implied regarding its use or any infringements of intellectual property rights or other rights of third parties.

This catalog provides information as of January, 2007. Specifications and information herein are subject to change without notice.