Ordering number : ENA0425

SANYO Semiconductors
DATA SHEET

N-Channel and P-Channel Silicon MOSFETs

VEC2611 — General-Purpose Switching Device Applications

Features

- The VEC2611 incorporates an N-channel MOSFET and a P-channel MOSFET that feature low ON-resistance, thereby enabling high-density mounting.
- 1.8V 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}		20	−12	V
Gate-to-Source Voltage	V_{GSS}		±10	±8	V
Drain Current (DC)	I_D		3	−2.6	A
Drain Current (Pulse)	I_{DP}	PW≤10μs, duty cycle≤1%	12	−10.4	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	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		1.3	V
Forward Transfer Admittance	$\|yfs\|$	V_{DS}=10V, I_D=1.5A	3.3	5.6		S

Marking : CP

Continued on next page.

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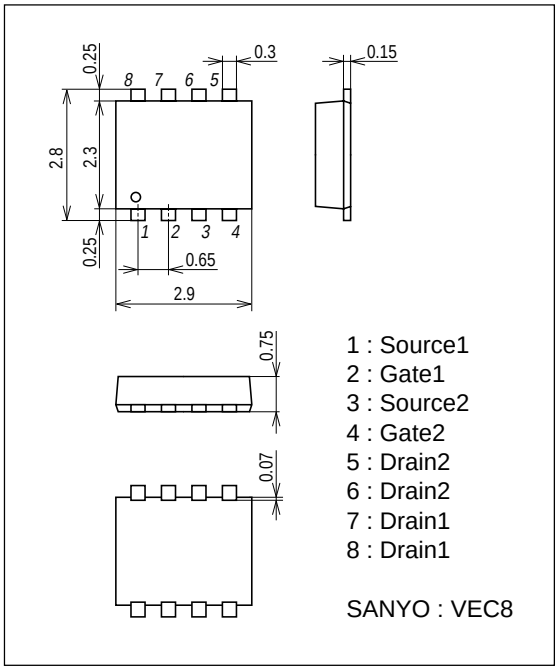
Parameter	Symbol	Conditions	Ratings			Unit
			min	typ	max	
Static Drain-to-Source On-State Resistance	$R_{DS}(on)1$	I_D=1.5A, V_{GS}=4V		53	69	mΩ
	$R_{DS}(on)2$	I_D=1A, V_{GS}=2.5V		63	90	mΩ
	$R_{DS}(on)3$	I_D=0.5A, V_{GS}=1.8V		77	116	mΩ
Input Capacitance	Ciss	V_{DS}=10V, f=1MHz		280		pF
Output Capacitance	Coss	V_{DS}=10V, f=1MHz		60		pF
Reverse Transfer Capacitance	Crss	V_{DS}=10V, f=1MHz		38		pF
Turn-ON Delay Time	$t_d(on)$	See specified Test Circuit.		13		ns
Rise Time	t_r	See specified Test Circuit.		35		ns
Turn-OFF Delay Time	$t_d(off)$	See specified Test Circuit.		35		ns
Fall Time	t_f	See specified Test Circuit.		25		ns
Total Gate Charge	Qg	V_{DS}=10V, V_{GS}=4V, I_D=3A		8.8		nC
Gate-to-Source Charge	Qgs	V_{DS}=10V, V_{GS}=4V, I_D=3A		0.85		nC
Gate-to-Drain “Miller” Charge	Qgd	V_{DS}=10V, V_{GS}=4V, I_D=3A		0.85		nC
Diode Forward Voltage	V_{SD}	I_S=3A, V_{GS}=0V		0.82	1.2	V
[P-channel]						
Drain-to-Source Breakdown Voltage	$V_{(BR)DSS}$	I_D=−1mA, V_{GS}=0V	−12			V
Zero-Gate Voltage Drain Current	I_{DSS}	V_{DS}=−12V, V_{GS}=0V			−10	μA
Gate-to-Source Leakage Current	I_{GSS}	V_{GS}=±6.4V, V_{DS}=0V			±10	μA
Cutoff Voltage	$V_{GS}(off)$	V_{DS}=−6V, I_D=−1mA	−0.3		−1.0	V
Forward Transfer Admittance	$\|yfs\|$	V_{DS}=−6V, I_D=−1.3A	2.5	4.2		S
Static Drain-to-Source On-State Resistance	$R_{DS}(on)1$	I_D=−1.3A, V_{GS}=−4.5V		80	105	mΩ
	$R_{DS}(on)2$	I_D=−0.7A, V_{GS}=−2.5V		115	165	mΩ
	$R_{DS}(on)3$	I_D=−0.3A, V_{GS}=−1.8V		155	265	mΩ
Input Capacitance	Ciss	V_{DS}=−6V, f=1MHz		450		pF
Output Capacitance	Coss	V_{DS}=−6V, f=1MHz		100		pF
Reverse Transfer Capacitance	Crss	V_{DS}=−6V, f=1MHz		85		pF
Turn-ON Delay Time	$t_d(on)$	See specified Test Circuit.		15		ns
Rise Time	t_r	See specified Test Circuit.		70		ns
Turn-OFF Delay Time	$t_d(off)$	See specified Test Circuit.		65		ns
Fall Time	t_f	See specified Test Circuit.		50		ns
Total Gate Charge	Qg	V_{DS}=−6V, V_{GS}=−4.5V, I_D=−2.6A		6.5		nC
Gate-to-Source Charge	Qgs	V_{DS}=−6V, V_{GS}=−4.5V, I_D=−2.6A		0.8		nC
Gate-to-Drain “Miller” Charge	Qgd	V_{DS}=−6V, V_{GS}=−4.5V, I_D=−2.6A		2.0		nC
Diode Forward Voltage	V_{SD}	I_S=−2.6A, V_{GS}=0V		−0.87	−1.5	V

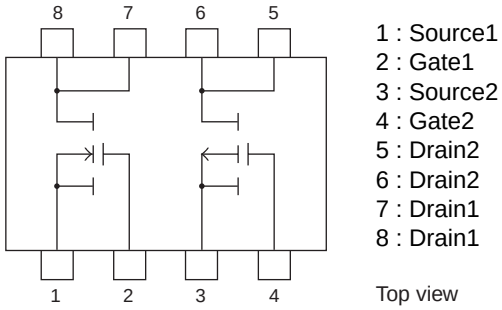
Package Dimensions

unit : mm (typ)

7012-002

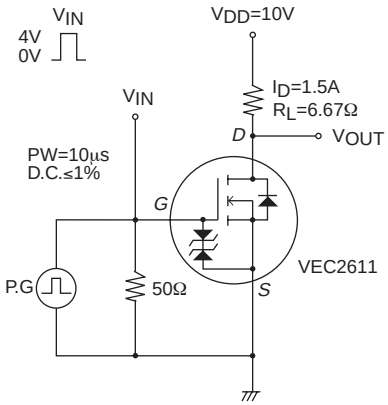


Electrical Connection



Switching Time Test Circuit

[N-channel]



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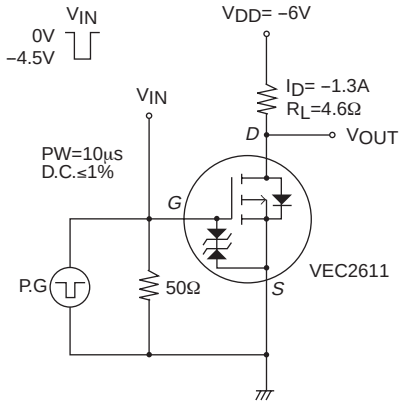
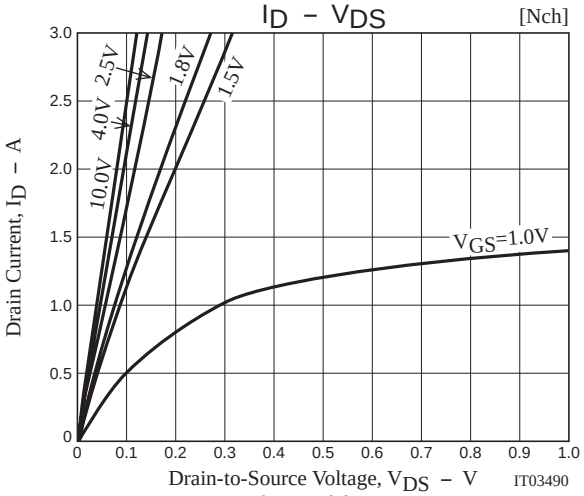
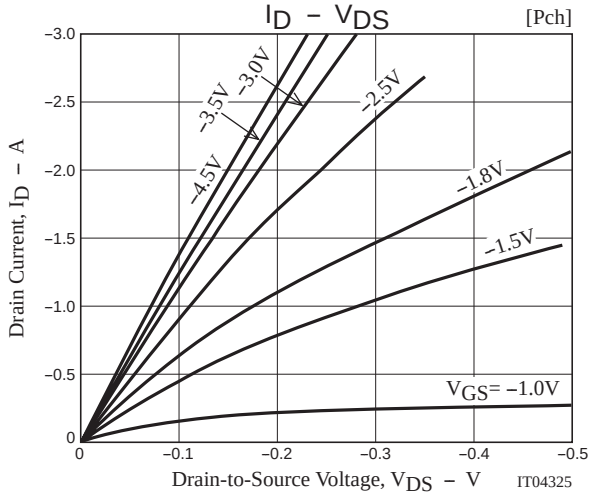
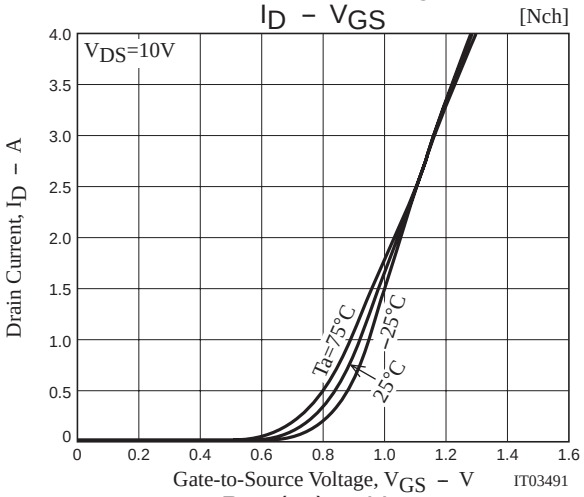
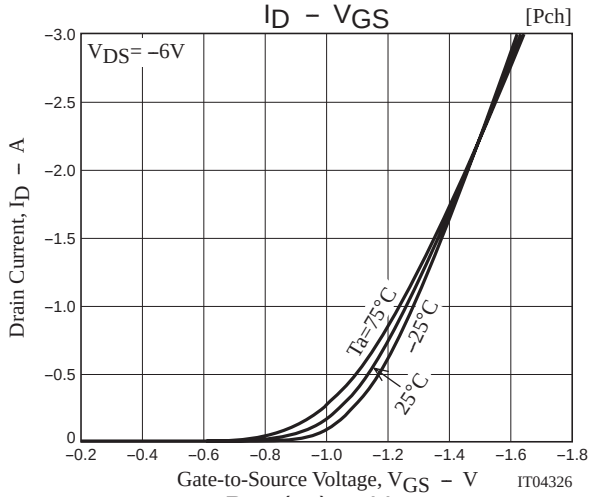
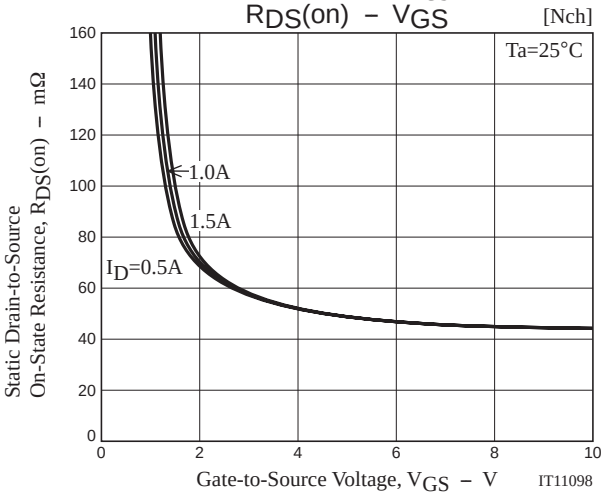


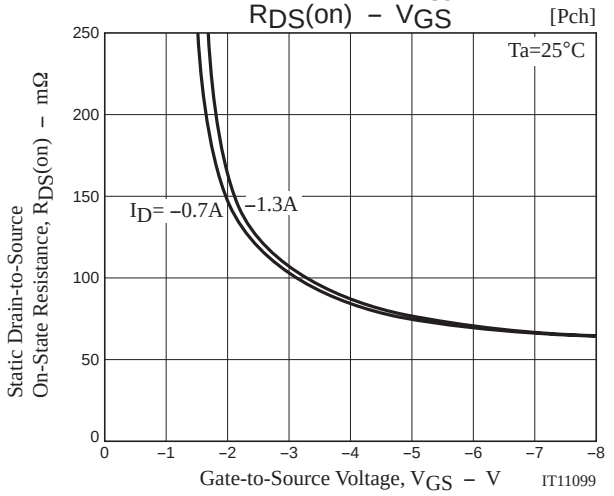


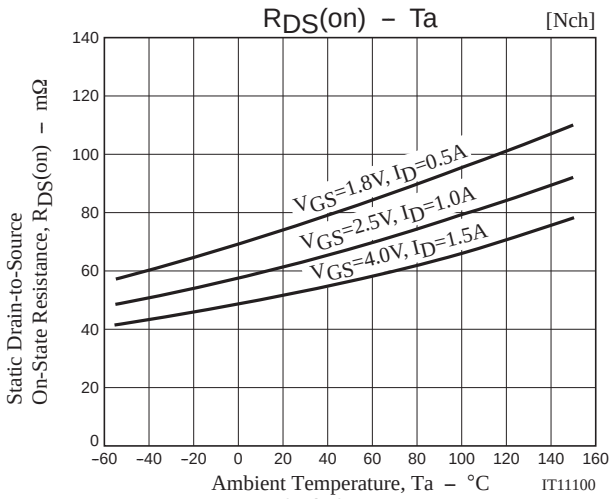


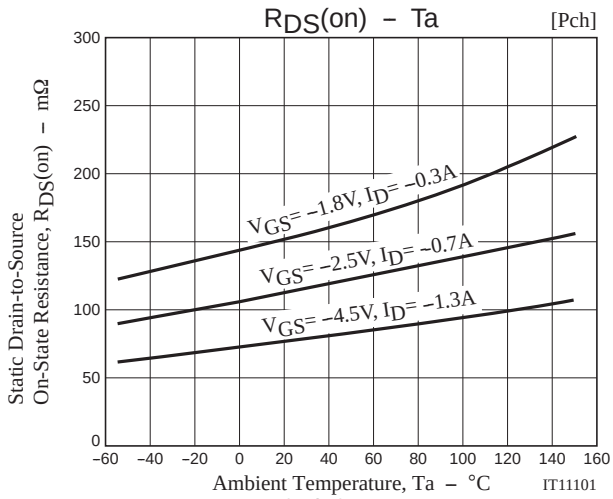


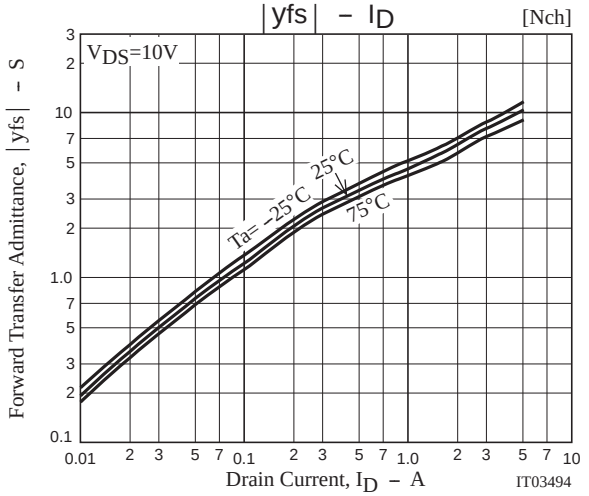


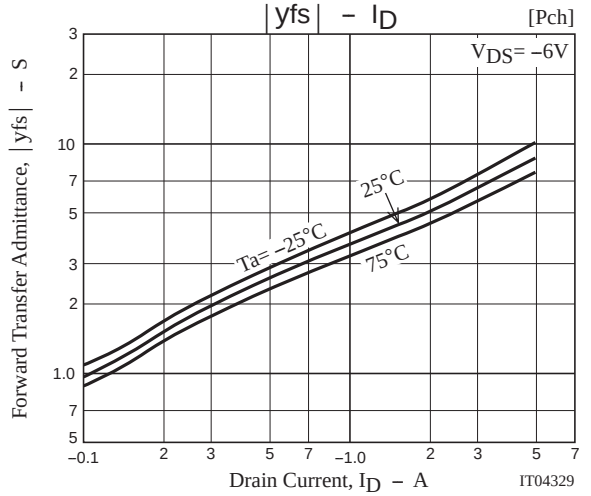


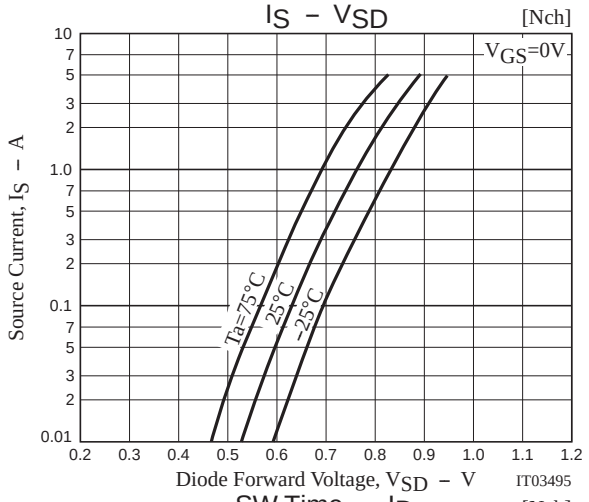


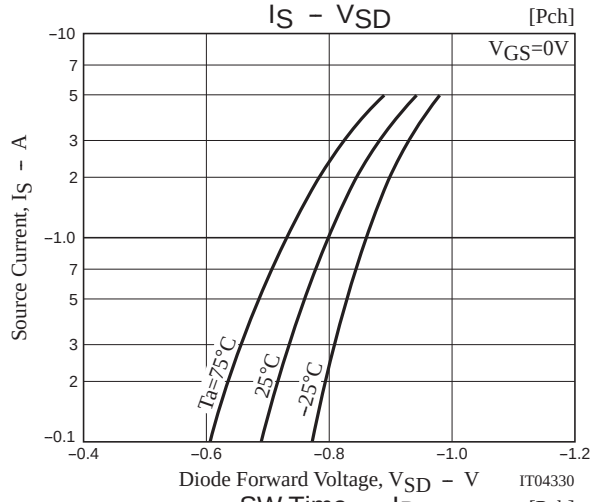

RDS(on) – Ta
[Nch]
Static Drain-to-Source On-State Resistance, RDS(on) – mΩ
VGS=1.8V, ID=0.5A
VGS=2.5V, ID=1.0A
VGS=4.0V, ID=1.5A
Ambient Temperature, Ta – °C
IT11100

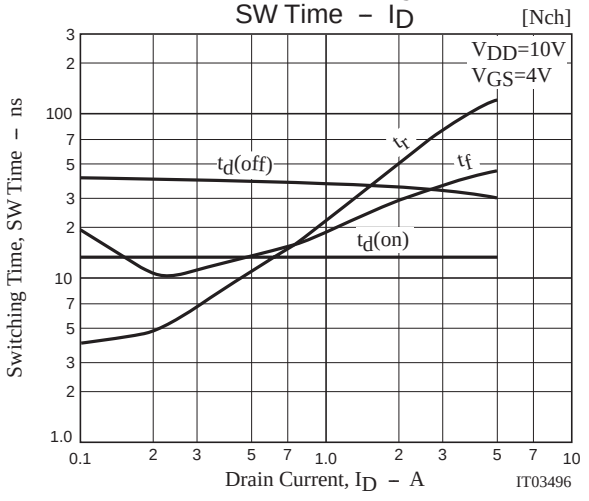

RDS(on) – Ta
[Pch]
Static Drain-to-Source On-State Resistance, RDS(on) – mΩ
VGS= –1.8V, ID= –0.3A
VGS= –2.5V, ID= –0.7A
VGS= –4.5V, ID= –1.3A
Ambient Temperature, Ta – °C
IT11101

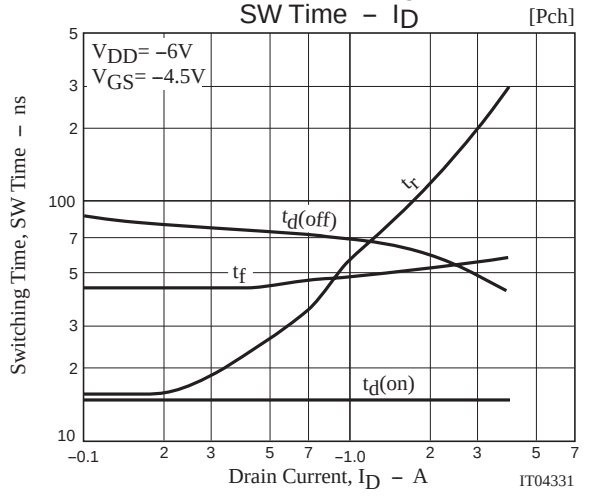

|yfs| – ID
[Nch]
VDS=10V
Forward Transfer Admittance, |yfs| – S
Ta= –25°C
25°C
75°C
Drain Current, ID – A
IT03494

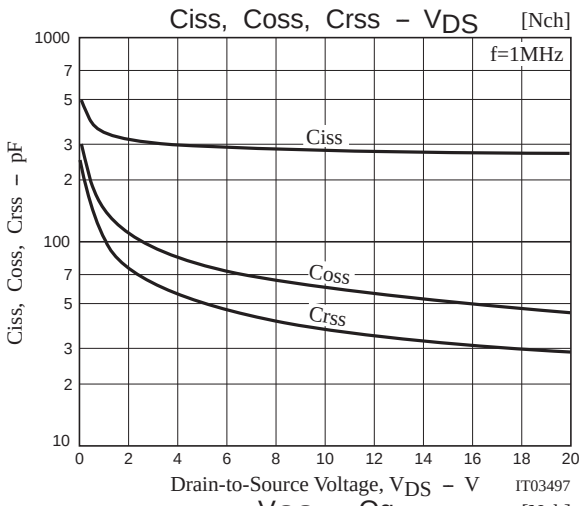

|yfs| – ID
[Pch]
VDS= –6V
Forward Transfer Admittance, |yfs| – S
Ta= –25°C
25°C
75°C
Drain Current, ID – A
IT04329

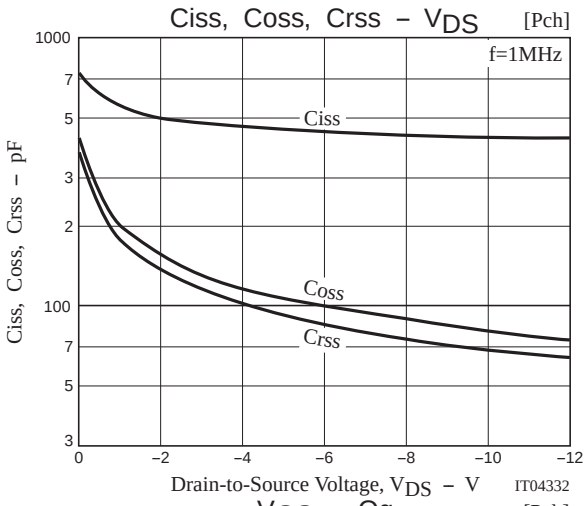

IS – VSD
[Nch]
VGS=0V
Source Current, IS – A
Ta=75°C
25°C
–25°C
Diode Forward Voltage, VSD – V
IT03495

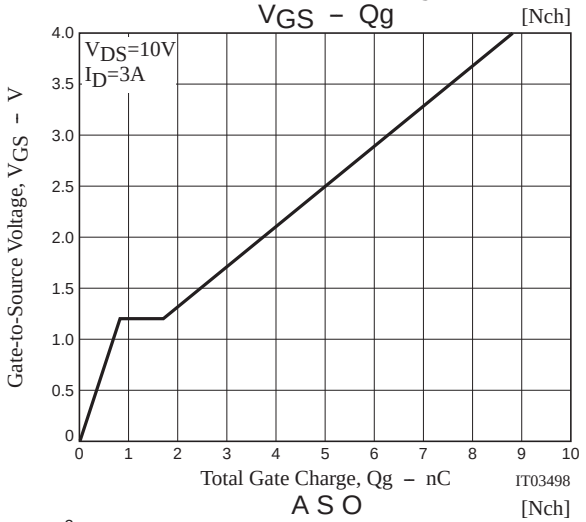

IS – VSD
[Pch]
VGS=0V
Source Current, IS – A
Ta=75°C
25°C
–25°C
Diode Forward Voltage, VSD – V
IT04330

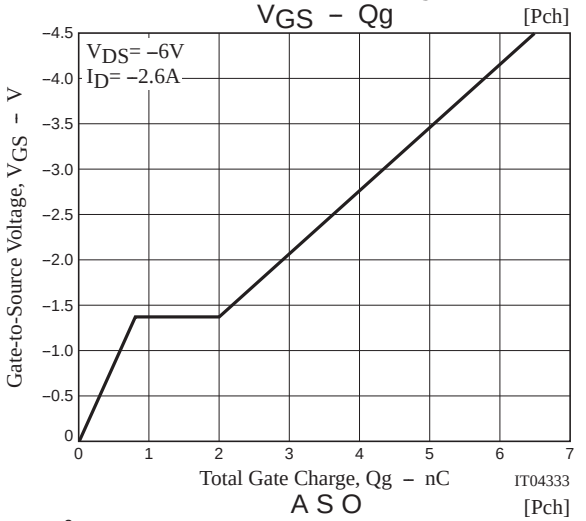

SW Time – ID
[Nch]
VDD=10V
VGS=4V
Switching Time, SW Time – ns
td(off)
tr
tf
td(on)
Drain Current, ID – A
IT03496

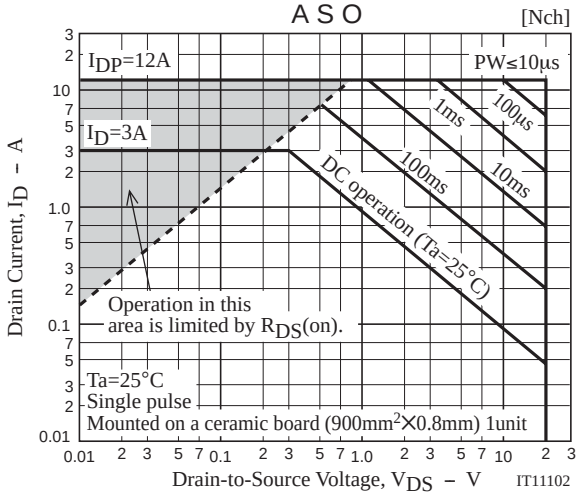

SW Time – ID
[Pch]
VDD= –6V
VGS= –4.5V
Switching Time, SW Time – ns
tr
td(off)
tf
td(on)
Drain Current, ID – A
IT04331

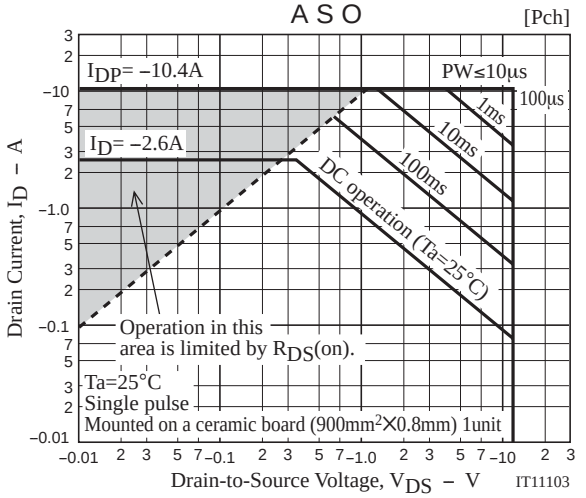

Ciss, Coss, Crss – VDS [Nch]
f=1MHz
Ciss
Coss
Crss
Ciss, Coss, Crss – pF
Drain-to-Source Voltage, VDS – V
IT03497

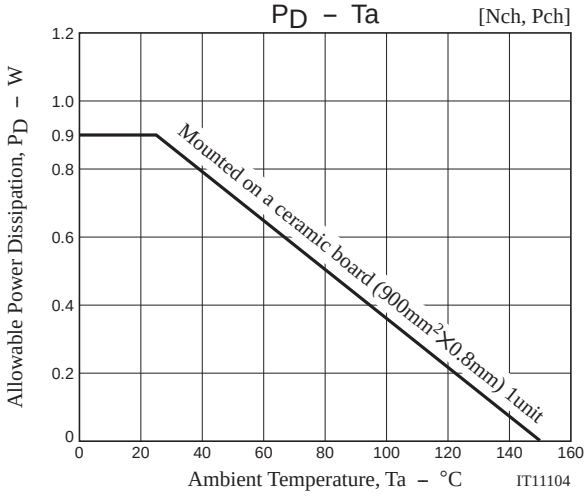

Ciss, Coss, Crss – VDS [Pch]
f=1MHz
Ciss
Coss
Crss
Ciss, Coss, Crss – pF
Drain-to-Source Voltage, VDS – V
IT04332


VGS – Qg [Nch]
VDS=10V
ID=3A
Gate-to-Source Voltage, VGS – V
Total Gate Charge, Qg – nC
IT03498


VGS – Qg [Pch]
VDS= –6V
ID= –2.6A
Gate-to-Source Voltage, VGS – V
Total Gate Charge, Qg – nC
IT04333


A S O [Nch]
IDP=12A
PW≤10μs
ID=3A
1ms
100μs
10ms
100ms
DC operation (Ta=25°C)
Operation in this
area is limited by RDS(on).
Ta=25°C
Single pulse
Mounted on a ceramic board (900mm2×0.8mm) 1unit
Drain Current, ID – A
Drain-to-Source Voltage, VDS – V
IT11102


A S O [Pch]
IDP= –10.4A
PW≤10μs
100μs
ID= –2.6A
1ms
10ms
100ms
DC operation (Ta=25°C)
Operation in this
area is limited by RDS(on).
Ta=25°C
Single pulse
Mounted on a ceramic board (900mm2×0.8mm) 1unit
Drain Current, ID – A
Drain-to-Source Voltage, VDS – V
IT11103


PD – Ta [Nch, Pch]
Mounted on a ceramic board (900mm2×0.8mm) 1unit
Allowable Power Dissipation, PD – W
Ambient Temperature, Ta – °C
IT11104

Note on usage : Since the VEC2611 is a MOSFET product, please avoid using this device in the vicinity of highly charged objects.

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