



VEC2609 — General-Purpose Switching Device Applications

N-Channel and P-Channel Silicon MOSFETs

Features

- The best suited for inverter applications.
- The VEC2609 incorporates an N-channel MOSFET and a P-channel MOSFET that feature low ON-resistance, thereby enabling high-density mounting.
- Low voltage 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	-12	V
Gate-to-Source Voltage	V _{GSS}		±20	±8	V
Drain Current (DC)	I _D		1.4	-2	A
Drain Current (Pulse)	I _{DP}	PW≤10μs, duty cycle≤1%	5.6	-8	A
Allowable Power Dissipation	P _D	Mounted on a ceramic board (900mm ² ×0.8mm)1unit	0.8		W
Total Dissipation	P _T	Mounted on a ceramic board (900mm ² ×0.8mm)	1.0		W
Channel Temperature	T _{ch}		150		°C
Storage Temperature	T _{stg}		-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	y _{fs}	V _{DS} =10V, I _D =700mA	0.66	1.1		S
Static Drain-to-Source On-State Resistance	R _{DS(on)1}	I _D =700mA, V _{GS} =10V		230	300	mΩ
	R _{DS(on)2}	I _D =400mA, V _{GS} =4V		400	560	mΩ
Input Capacitance	C _{iss}	V _{DS} =10V, f=1MHz		65		pF
Output Capacitance	C _{oss}	V _{DS} =10V, f=1MHz		14		pF
Reverse Transfer Capacitance	C _{rss}	V _{DS} =10V, f=1MHz		8		pF

Marking : CF

Continued on next page.

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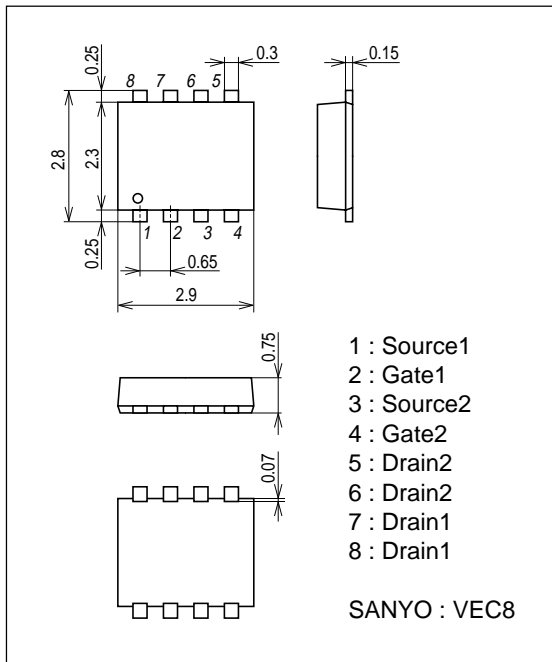
Continued from preceding page.

Parameter	Symbol	Conditions	Ratings			Unit
			min	typ	max	
Turn-ON Delay Time	$t_{d(on)}$	See specified Test Circuit.		5		ns
Rise Time	t_r	See specified Test Circuit.		4		ns
Turn-OFF Delay Time	$t_{d(off)}$	See specified Test Circuit.		11		ns
Fall Time	t_f	See specified Test Circuit.		3		ns
Total Gate Charge	Q_g	$V_{DS}=10V, V_{GS}=10V, I_D=1.4A$		2.5		nC
Gate-to-Source Charge	Q_{gs}	$V_{DS}=10V, V_{GS}=10V, I_D=1.4A$		0.6		nC
Gate-to-Drain "Miller" Charge	Q_{gd}	$V_{DS}=10V, V_{GS}=10V, I_D=1.4A$		0.3		nC
Diode Forward Voltage	V_{SD}	$I_S=1.4A, V_{GS}=0V$		0.87	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}	$V_{GS}=\pm 6.4V, V_{DS}=0V$			± 10	μA
Cutoff Voltage	$V_{GS(off)}$	$V_{DS}=-6V, I_D=-1mA$	-0.3		-1.0	V
Forward Transfer Admittance	$ y_{fs} $	$V_{DS}=-6V, I_D=-1.5A$	2.7	4.5		S
Static Drain-to-Source On-State Resistance	$R_{DS(on)1}$	$I_D=-1.5A, V_{GS}=-4.5V$		87	115	$m\Omega$
	$R_{DS(on)2}$	$I_D=-0.8A, V_{GS}=-2.5V$		122	172	$m\Omega$
	$R_{DS(on)3}$	$I_D=-0.4A, V_{GS}=-1.8V$		162	275	$m\Omega$
Input Capacitance	C_{iss}	$V_{DS}=-6V, f=1MHz$		450		pF
Output Capacitance	C_{oss}	$V_{DS}=-6V, f=1MHz$		100		pF
Reverse Transfer Capacitance	C_{rss}	$V_{DS}=-6V, f=1MHz$		85		pF
Turn-ON Delay Time	$t_{d(on)}$	See specified Test Circuit.		15		ns
Rise Time	t_r	See specified Test Circuit.		75		ns
Turn-OFF Delay Time	$t_{d(off)}$	See specified Test Circuit.		64		ns
Fall Time	t_f	See specified Test Circuit.		50		ns
Total Gate Charge	Q_g	$V_{DS}=-6V, V_{GS}=-4.5V, I_D=-2.5A$		6.5		nC
Gate-to-Source Charge	Q_{gs}	$V_{DS}=-6V, V_{GS}=-4.5V, I_D=-2.5A$		0.8		nC
Gate-to-Drain "Miller" Charge	Q_{gd}	$V_{DS}=-6V, V_{GS}=-4.5V, I_D=-2.5A$		2.0		nC
Diode Forward Voltage	V_{SD}	$I_S=-2.5A, V_{GS}=0V$		-0.85	-1.5	V

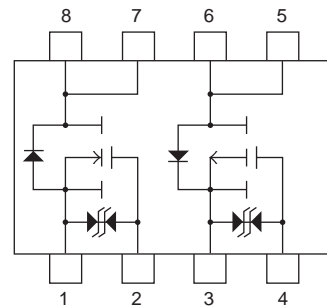
Package Dimensions

unit : mm

7012-002



Electrical Connection

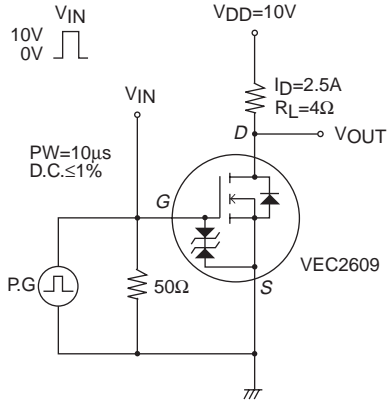


- 1 : Source1
 - 2 : Gate1
 - 3 : Source2
 - 4 : Gate2
 - 5 : Drain2
 - 6 : Drain2
 - 7 : Drain1
 - 8 : Drain1
- Top view

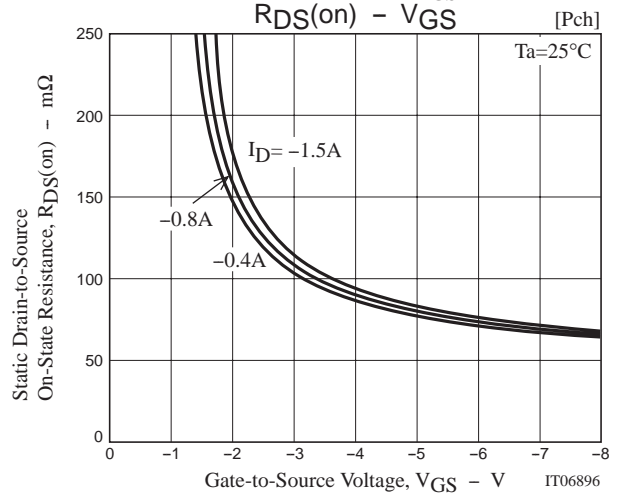
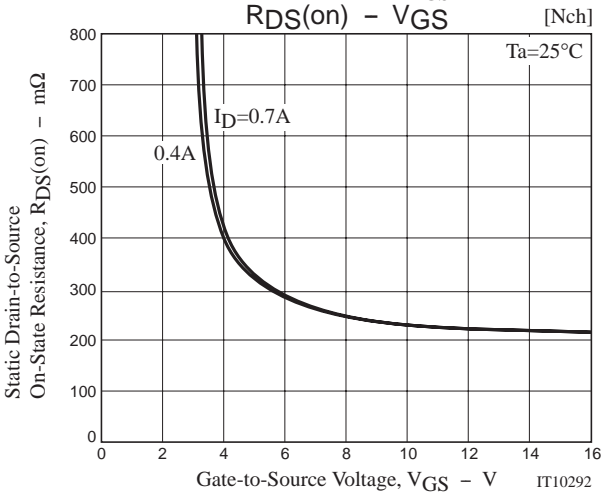
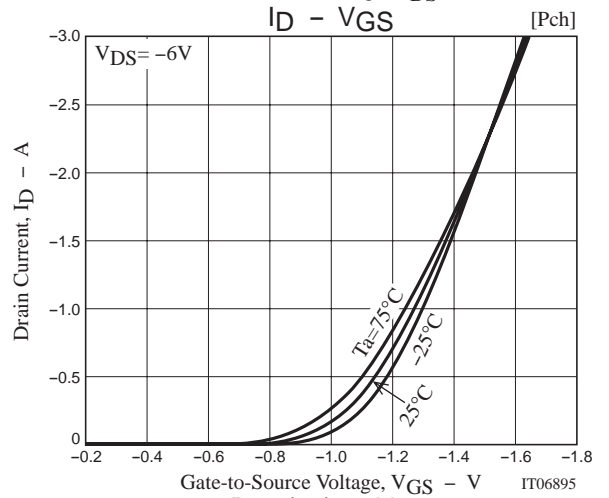
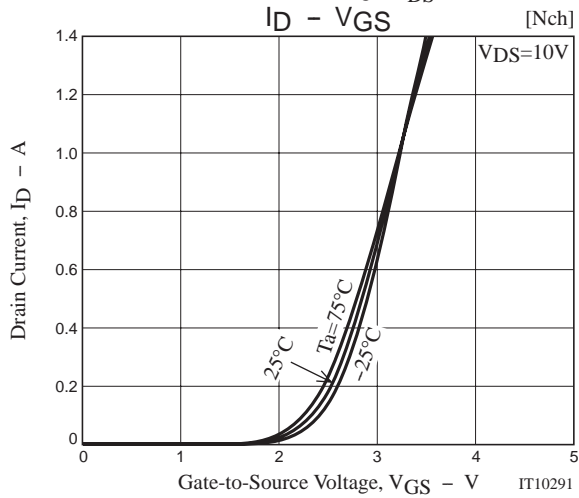
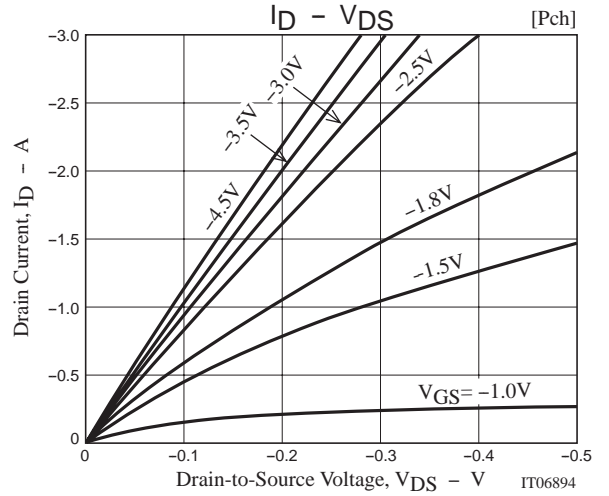
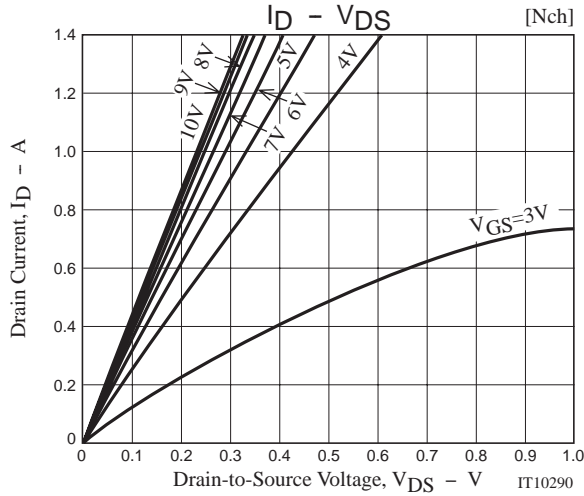
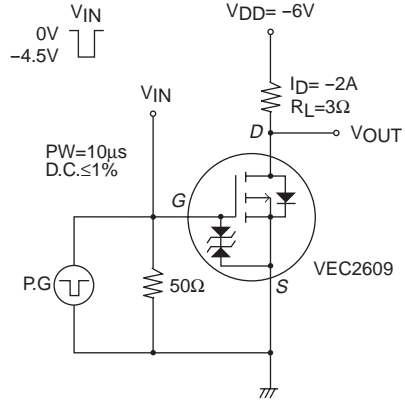
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Switching Time Test Circuit

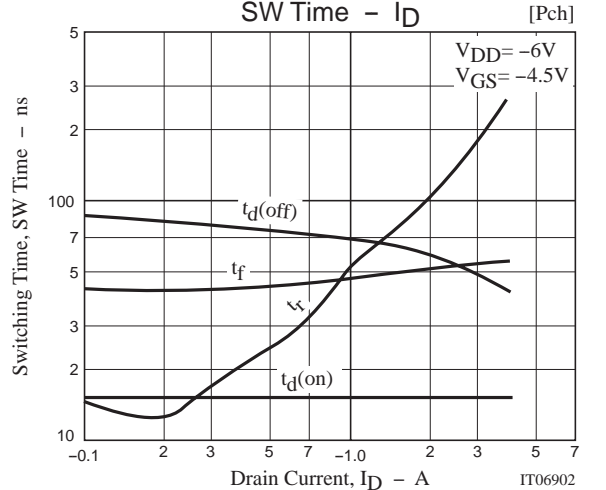
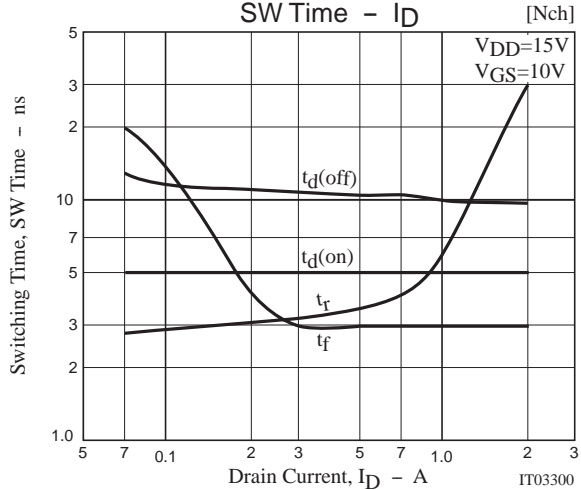
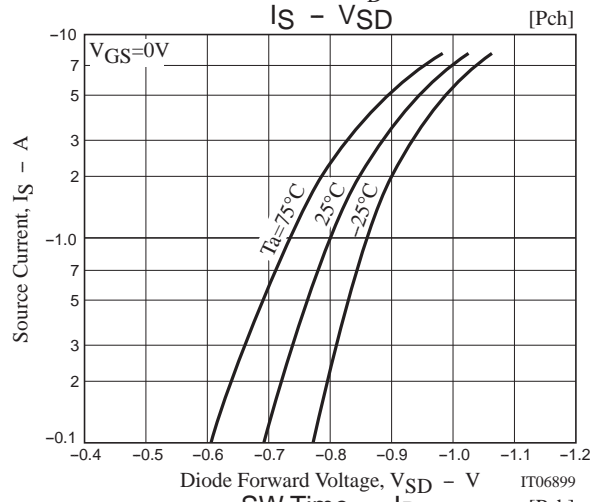
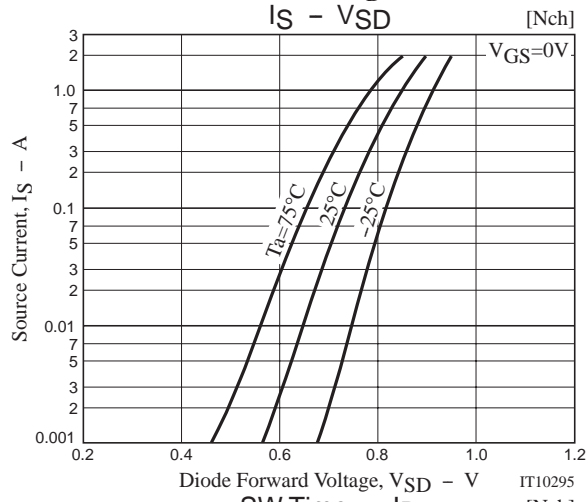
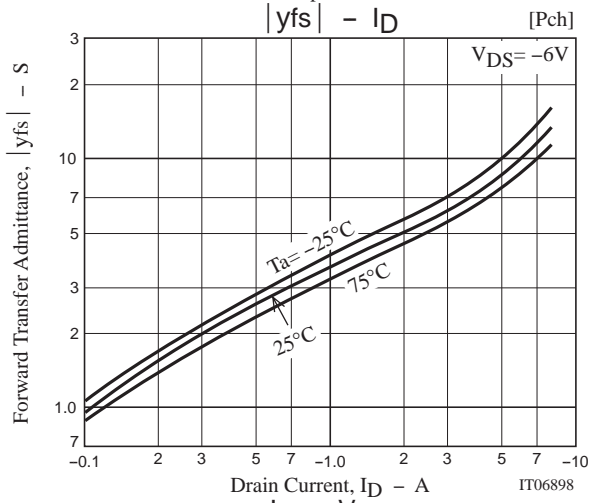
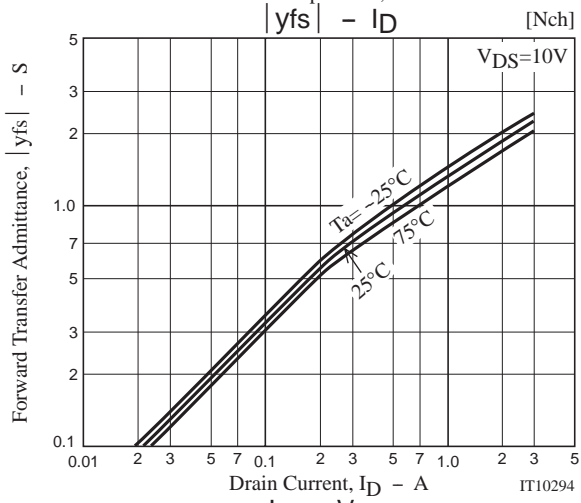
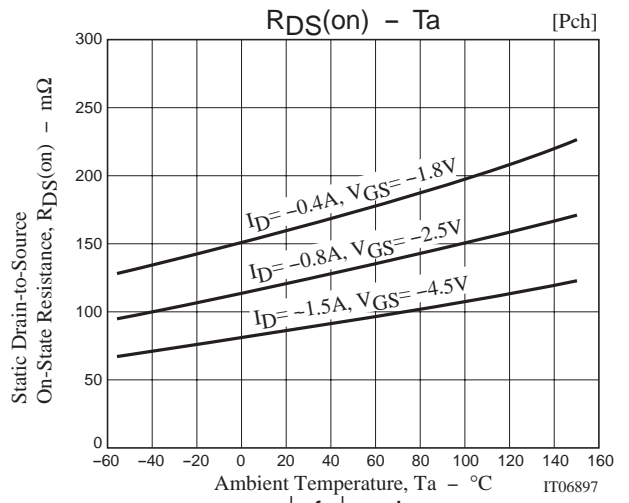
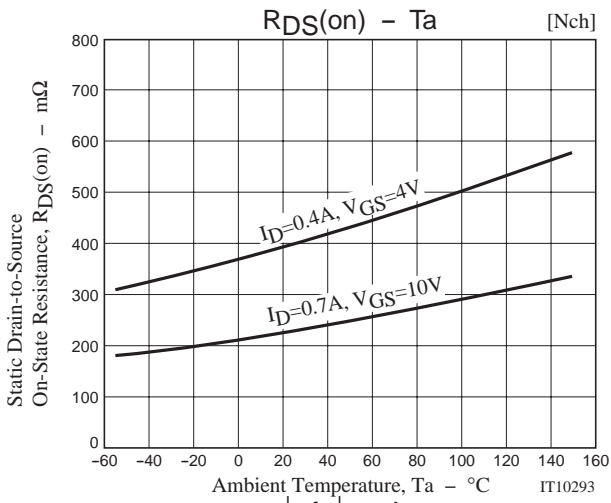
[N-channel]



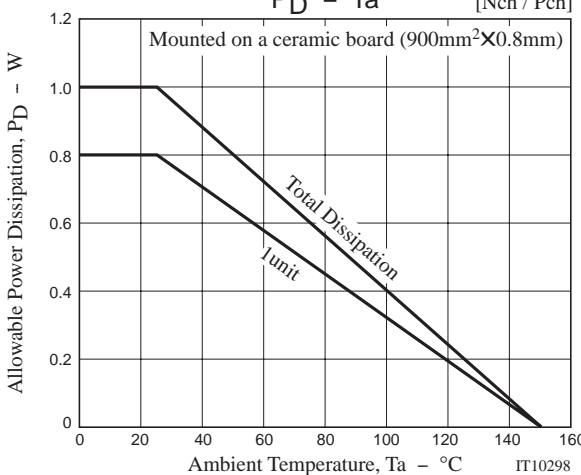
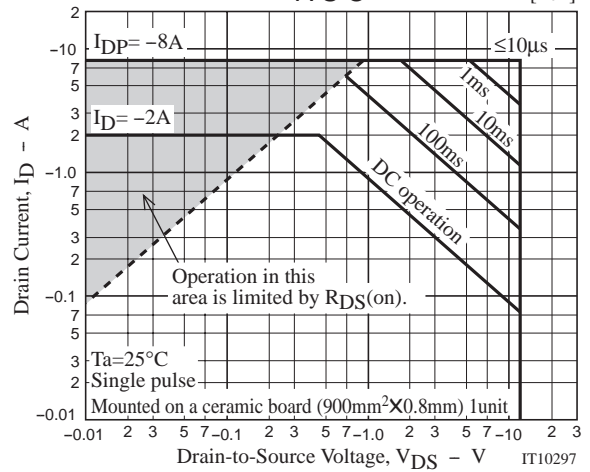
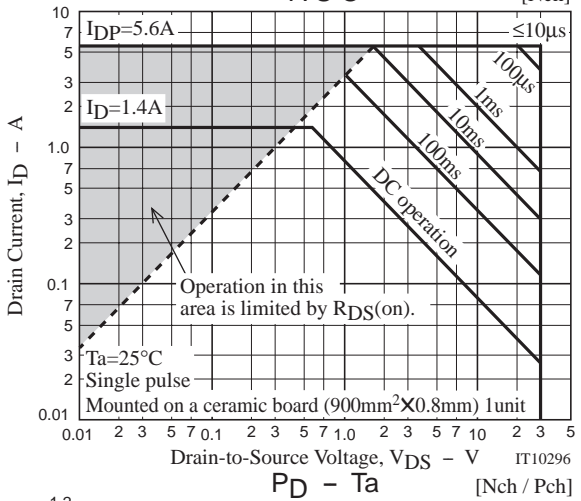
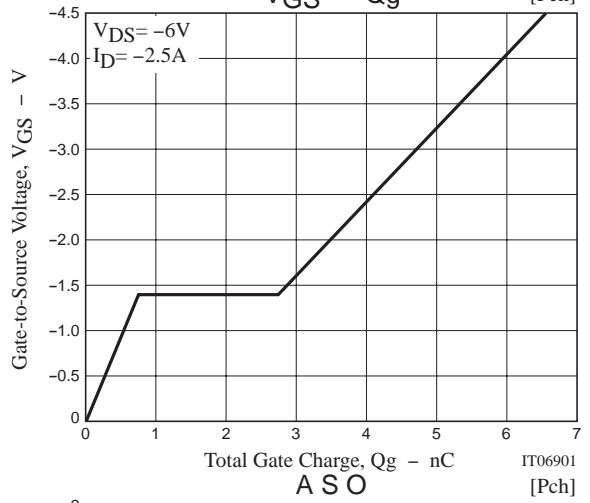
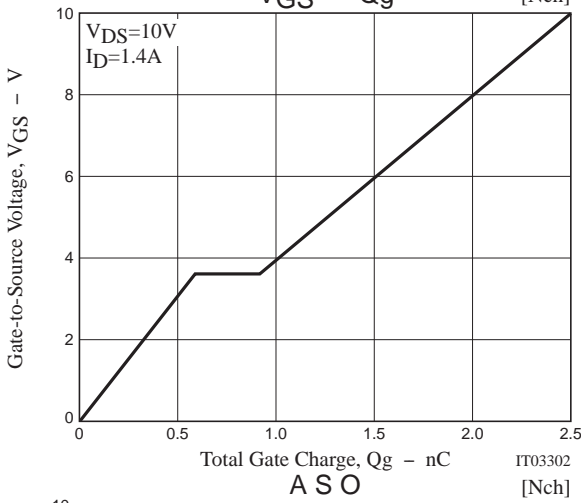
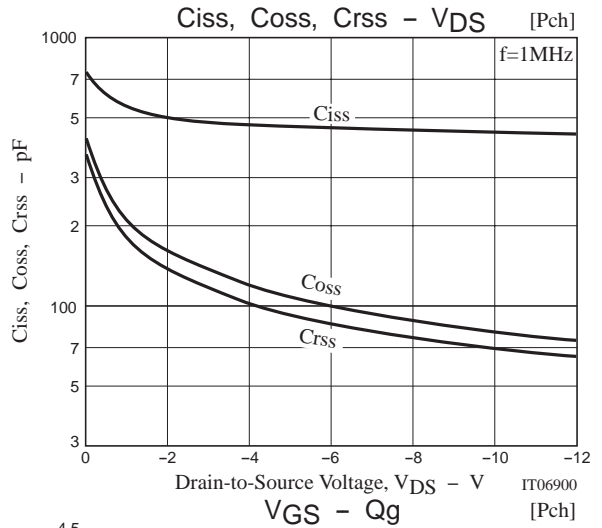
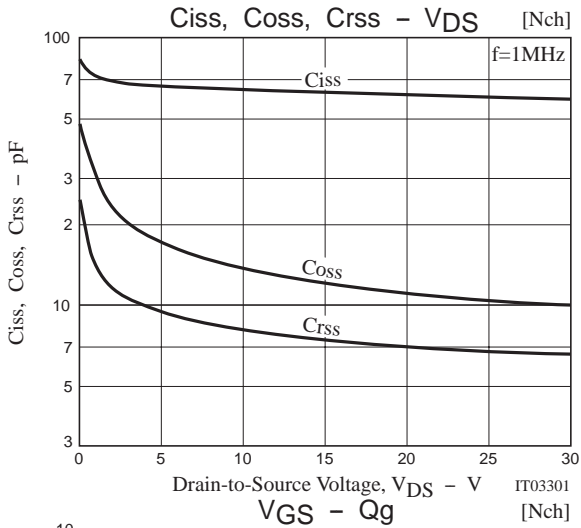
[P-channel]



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Note on usage : Since the VEC2609 is a MOSFET product, please avoid using this device in the vicinity of highly charged objects.

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