



# VEC2610 — General-Purpose Switching Device Applications

N-Channel and P-Channel Silicon MOSFETs

## Features

- The best suited for inverter applications.
- The VEC2610 incorporates an N-channel MOSFET and a P-channel MOSFET that feature low ON-resistance, thereby enabling high-density mounting.
- Mounting height 0.75mm.
- 1.8V drive.

## Specifications

### Absolute Maximum Ratings at Ta=25°C

Parameter	Symbol	Conditions	N-channel	P-channel	Unit
Drain-to-Source Voltage	V <sub>DSS</sub>		20	-20	V
Gate-to-Source Voltage	V <sub>GSS</sub>		±10	±10	V
Drain Current (DC)	I <sub>D</sub>		4.5	-3	A
Drain Current (Pulse)	I <sub>DP</sub>	PW≤10μs, duty cycle≤1%	18	-12	A
Allowable Power Dissipation	P <sub>D</sub>	Mounted on a ceramic board (900mm²X0.8mm)1unit	0.9		W
Total Dissipation	P <sub>T</sub>	Mounted on a ceramic board (900mm²X0.8mm)	1.0		W
Channel Temperature	T <sub>ch</sub>		150		°C
Storage Temperature	T <sub>stg</sub>		-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 <sub>D</sub> =1mA, V <sub>GS</sub> =0V	20			V
Zero-Gate Voltage Drain Current	I <sub>DSS</sub>	V <sub>DS</sub> =20V, V <sub>GS</sub> =0V			1	μA
Gate-to-Source Leakage Current	I <sub>GSS</sub>	V <sub>GS</sub> =±8V, V <sub>DS</sub> =0V			±10	μA
Cutoff Voltage	V <sub>GS(off)</sub>	V <sub>DS</sub> =10V, I <sub>D</sub> =1mA	0.5		1.3	V
Forward Transfer Admittance	y <sub>fs</sub>	V <sub>DS</sub> =10V, I <sub>D</sub> =2.5A	4.5	7.5		S
Static Drain-to-Source On-State Resistance	R <sub>DS(on)1</sub>	I <sub>D</sub> =2A, V <sub>GS</sub> =4V		32	42	mΩ
	R <sub>DS(on)2</sub>	I <sub>D</sub> =1A, V <sub>GS</sub> =2.5V		40	57	mΩ
	R <sub>DS(on)3</sub>	I <sub>D</sub> =0.3A, V <sub>GS</sub> =1.8V		55	80	mΩ
Input Capacitance	C <sub>iss</sub>	V <sub>DS</sub> =10V, f=1MHz		570		pF
Output Capacitance	C <sub>oss</sub>	V <sub>DS</sub> =10V, f=1MHz		110		pF
Reverse Transfer Capacitance	C <sub>rss</sub>	V <sub>DS</sub> =10V, f=1MHz		80		pF

Marking : CG

Continued on next page.

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# VEC2610

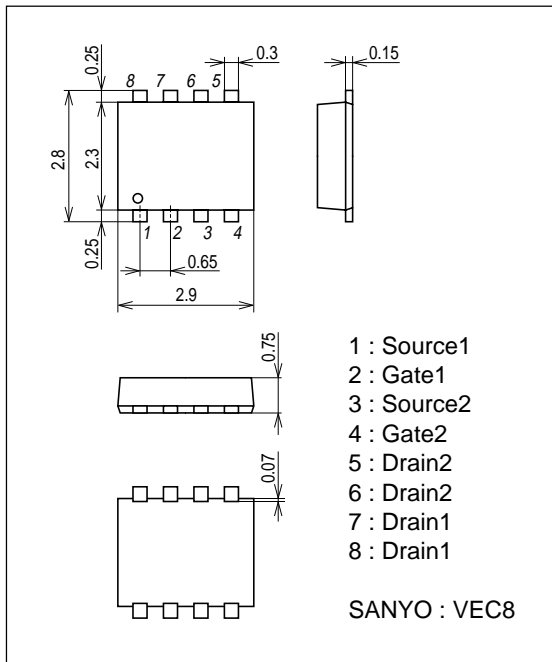
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Parameter	Symbol	Conditions	Ratings			Unit
			min	typ	max	
Turn-ON Delay Time	$t_{d(on)}$	See specified Test Circuit.		15		ns
Rise Time	$t_r$	See specified Test Circuit.		105		ns
Turn-OFF Delay Time	$t_{d(off)}$	See specified Test Circuit.		50		ns
Fall Time	$t_f$	See specified Test Circuit.		52		ns
Total Gate Charge	$Q_g$	$V_{DS}=10V, V_{GS}=4V, I_D=4.5A$		7.6		nC
Gate-to-Source Charge	$Q_{gs}$	$V_{DS}=10V, V_{GS}=4V, I_D=4.5A$		1.2		nC
Gate-to-Drain "Miller" Charge	$Q_{gd}$	$V_{DS}=10V, V_{GS}=4V, I_D=4.5A$		2.1		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	$V_{(BR)DSS}$	$I_D=-1mA, V_{GS}=0V$	-20			V
Zero-Gate Voltage Drain Current	$I_{DSS}$	$V_{DS}=-20V, V_{GS}=0V$			-1	$\mu A$
Gate-to-Source Leakage Current	$I_{GSS}$	$V_{GS}=\pm 8V, V_{DS}=0V$			$\pm 10$	$\mu A$
Cutoff Voltage	$V_{GS(off)}$	$V_{DS}=-10V, I_D=-1mA$	-0.4		-1.3	V
Forward Transfer Admittance	$ y_{fs} $	$V_{DS}=-10V, I_D=-1.5A$	2.9	4.9		S
Static Drain-to-Source On-State Resistance	$R_{DS(on)1}$	$I_D=-2A, V_{GS}=-4.5V$		62	81	$m\Omega$
	$R_{DS(on)2}$	$I_D=-1A, V_{GS}=-2.5V$		87	120	$m\Omega$
	$R_{DS(on)3}$	$I_D=-0.3A, V_{GS}=-1.8V$		145	205	$m\Omega$
Input Capacitance	$C_{iss}$	$V_{DS}=-10V, f=1MHz$		680		pF
Output Capacitance	$C_{oss}$	$V_{DS}=-10V, f=1MHz$		115		pF
Reverse Transfer Capacitance	$C_{rss}$	$V_{DS}=-10V, f=1MHz$		80		pF
Turn-ON Delay Time	$t_{d(on)}$	See specified Test Circuit.		13		ns
Rise Time	$t_r$	See specified Test Circuit.		53		ns
Turn-OFF Delay Time	$t_{d(off)}$	See specified Test Circuit.		77		ns
Fall Time	$t_f$	See specified Test Circuit.		62		ns
Total Gate Charge	$Q_g$	$V_{DS}=-10V, V_{GS}=-4.5V, I_D=-3A$		8.2		nC
Gate-to-Source Charge	$Q_{gs}$	$V_{DS}=-10V, V_{GS}=-4.5V, I_D=-3A$		1.7		nC
Gate-to-Drain "Miller" Charge	$Q_{gd}$	$V_{DS}=-10V, V_{GS}=-4.5V, I_D=-3A$		2.1		nC
Diode Forward Voltage	$V_{SD}$	$I_S=-3A, V_{GS}=0V$		-0.88	-1.2	V

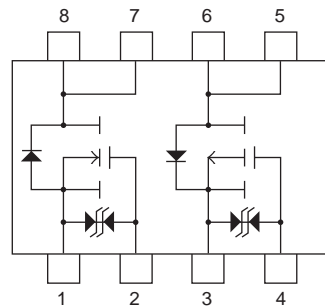
## Package Dimensions

unit : mm

7012-002



## Electrical Connection

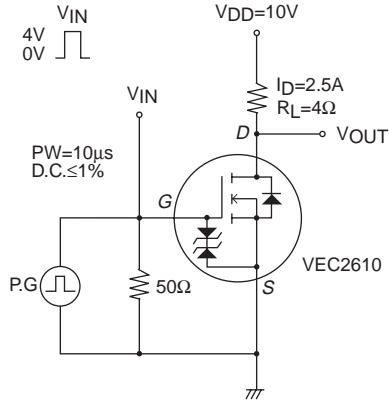


- 1 : Source1
  - 2 : Gate1
  - 3 : Source2
  - 4 : Gate2
  - 5 : Drain2
  - 6 : Drain2
  - 7 : Drain1
  - 8 : Drain1
- Top view

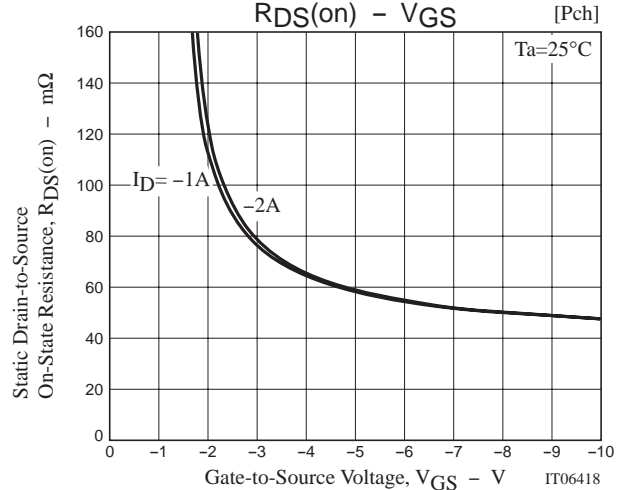
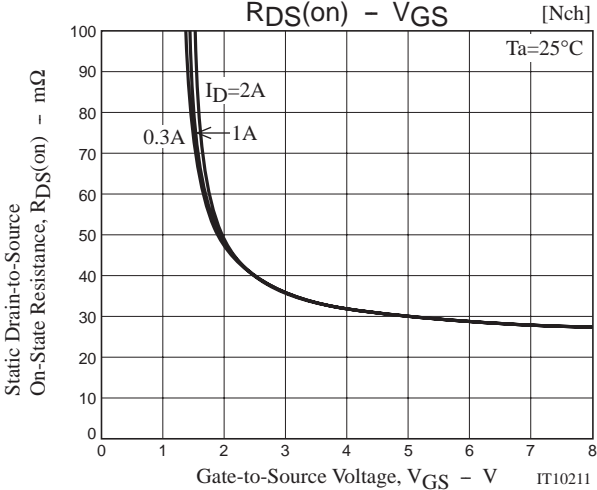
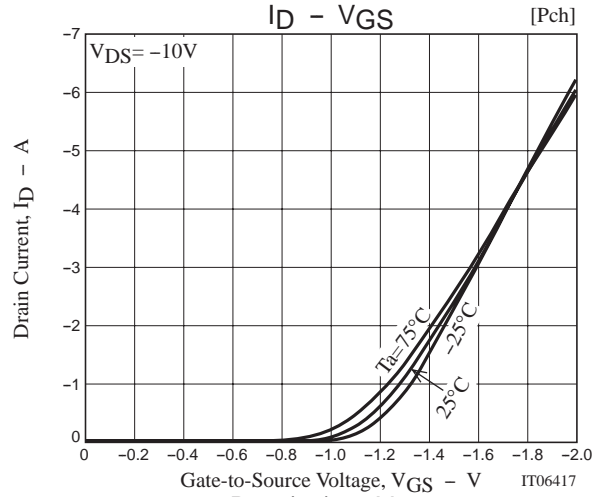
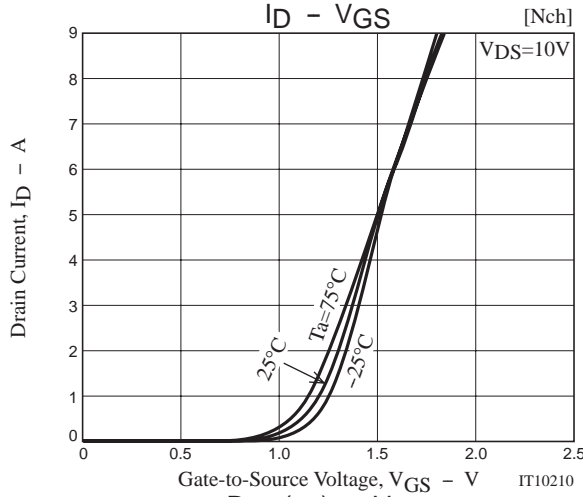
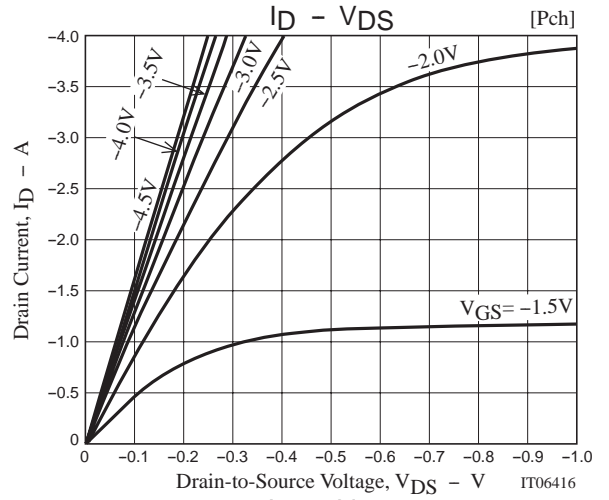
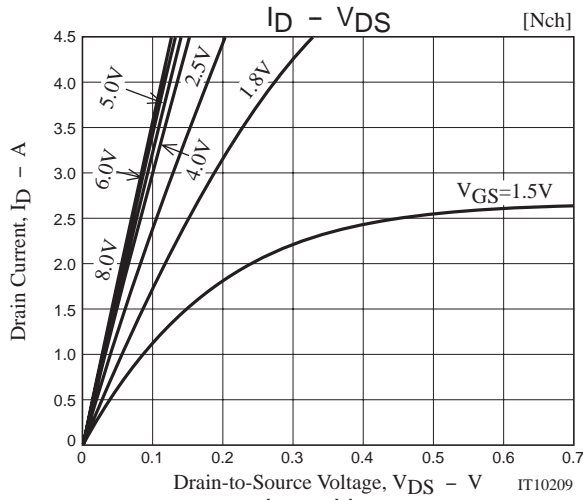
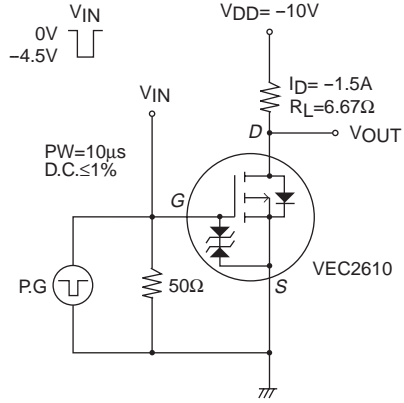
# VEC2610

## Switching Time Test Circuit

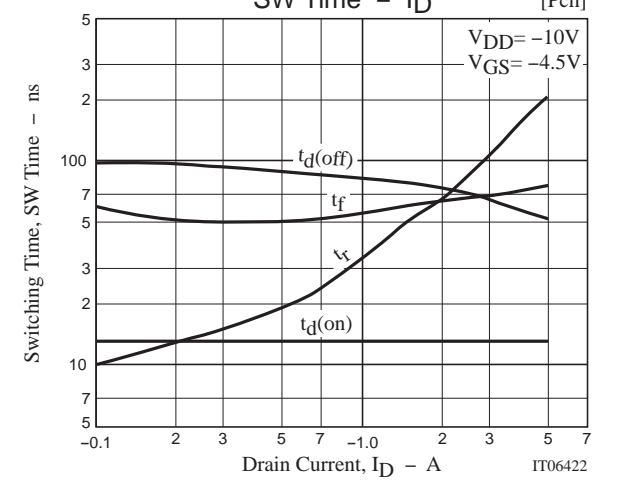
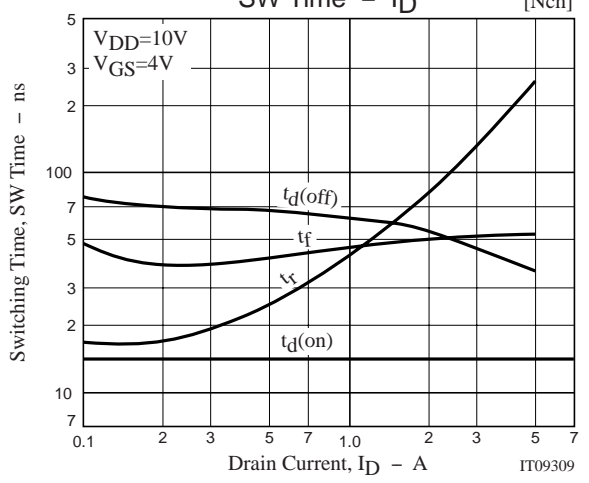
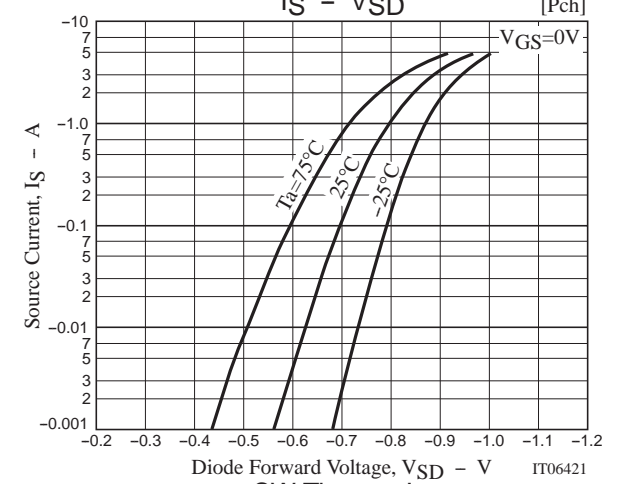
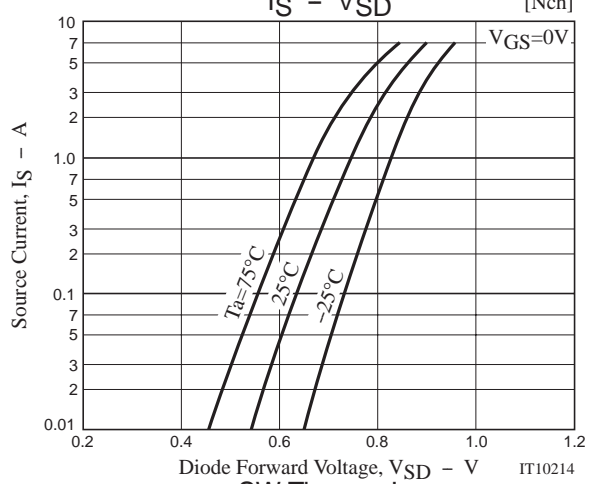
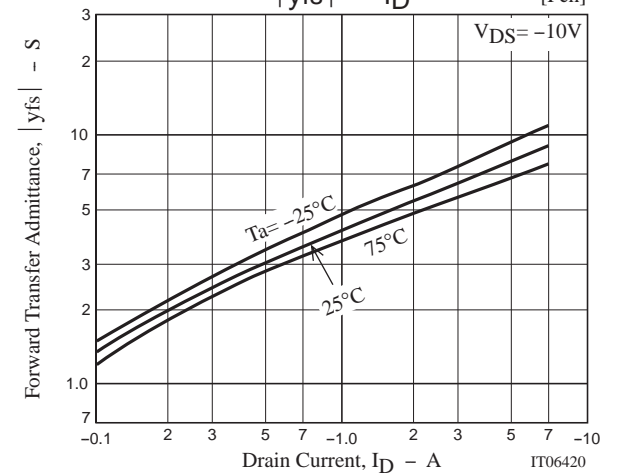
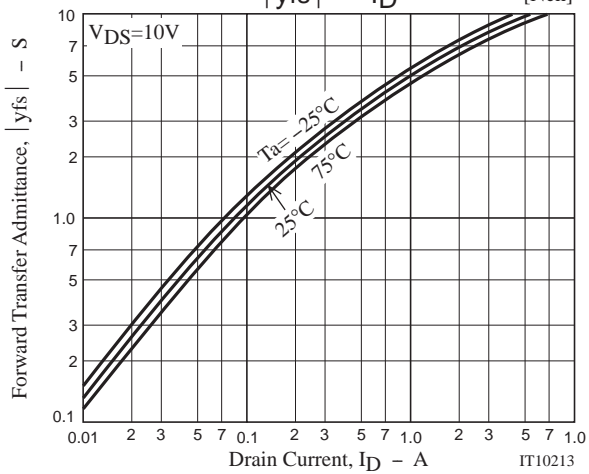
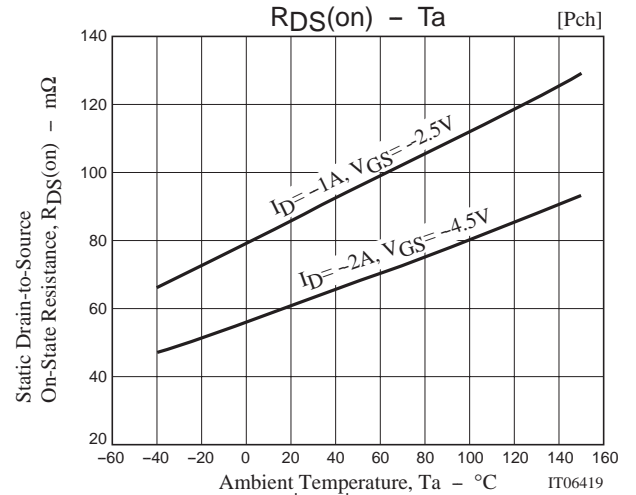
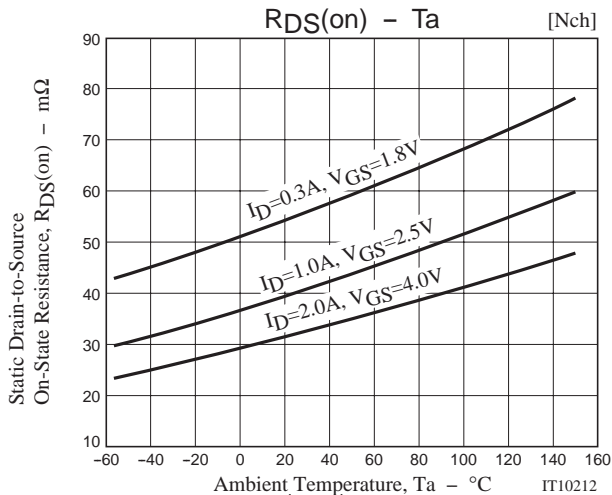
[N-channel]



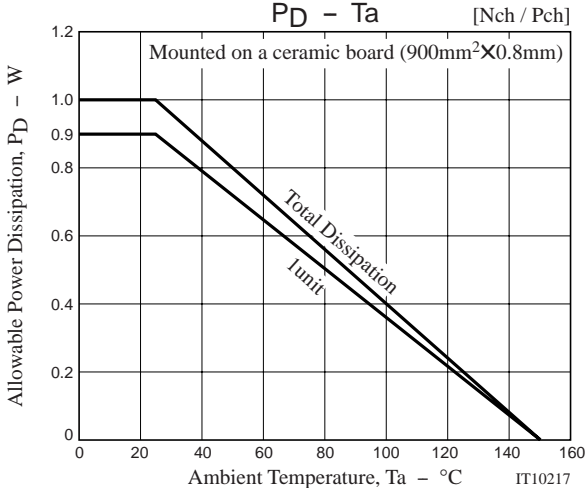
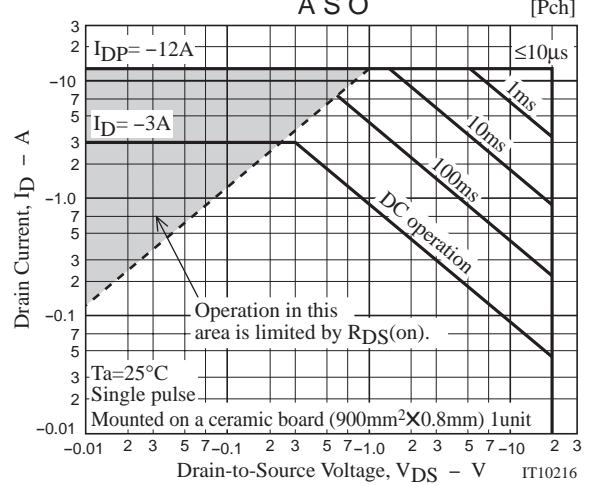
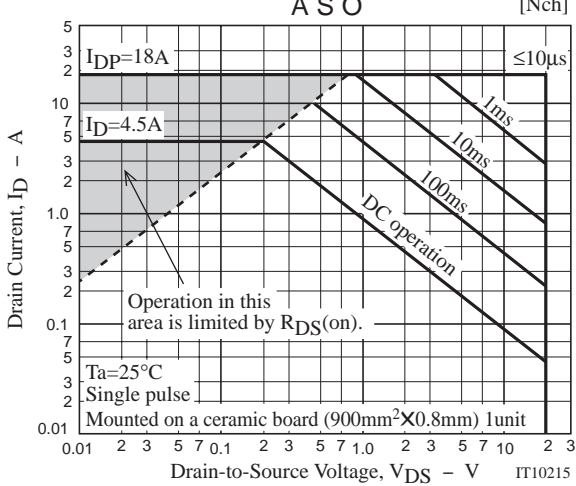
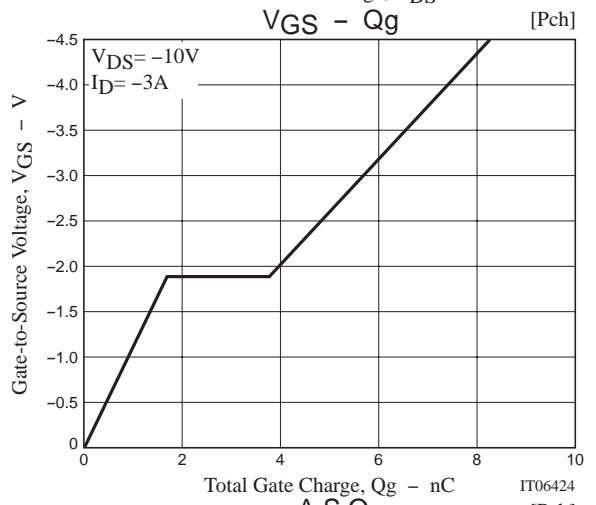
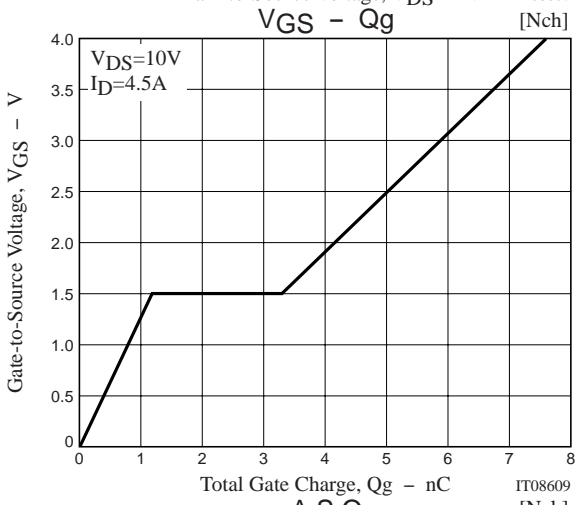
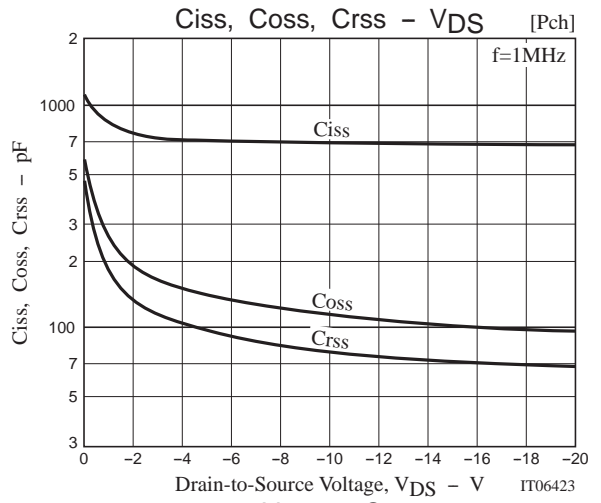
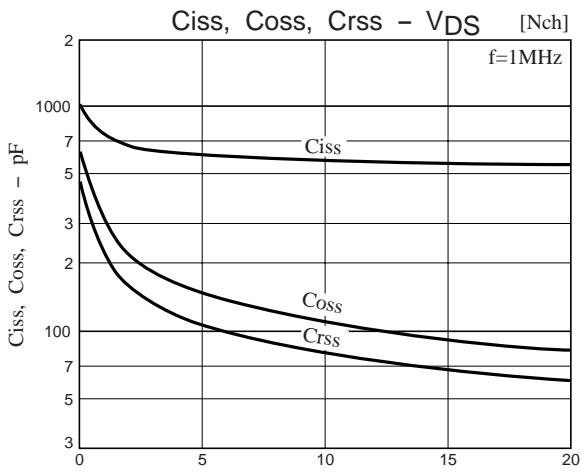
[P-channel]



# VEC2610



# VEC2610



Note on usage : Since the VEC2610 is a MOSFET product, please avoid using this device in the vicinity of highly charged objects.

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