Ordering number : ENN8197

SANYO Semiconductors
DATA SHEET

P-Channel and N-Channel Silicon MOSFET

VEC2605 — General-Purpose Switching Device Applications

Features

- Best suited for DC/DC converters.
- The VEC2605 incorporates a P-channel MOSFET and an N-channel MOSFET that feature low ON-resistance and ultrahigh-speed switching, thereby enabling high-density mounting.
- 2.5V drive.
- Mounting height 0.75mm.

Specifications

Absolute Maximum Ratings at Ta=25°C

Parameter	Symbol	Conditions	P-channel	N-channel	Unit
Drain-to-Source Voltage	V_{DSS}		−20	20	V
Gate-to-Source Voltage	V_{GSS}		±10	±10	V
Drain Current (DC)	I_D		−1	3	A
Drain Current (Pulse)	I_{DP}	PW≤10μs, duty cycle≤1%	−4	12	A
Allowable Power Dissipation	P_D	Mounted on a ceramic board (900mm²X0.8mm)1unit	0.8	0.9	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	
[P-channel]						
Drain-to-Source Breakdown Voltage	$V_{(BR)DSS}$	I_D=−1mA, V_{GS}=0	−20			V
Zero-Gate Voltage Drain Current	I_{DSS}	V_{DS}=−20V, V_{GS}=0			−1	μA
Gate-to-Source Leakage Current	I_{GSS}	V_{GS}=±8V, V_{DS}=0			±10	μA
Cutoff Voltage	V_{GS}(off)	V_{DS}=−10V, I_D=−1mA	−0.4		−1.4	V
Forward Transfer Admittance	|yfs|	V_{DS}=−10V, I_D=−500mA	0.72	1.2		S
Static Drain-to-Source On-State Resistance	R_{DS}(on)1	I_D=−500mA, V_{GS}=−4V		380	500	mΩ
	R_{DS}(on)2	I_D=−300mA, V_{GS}=−2.5V		540	760	mΩ
Input Capacitance	Ciss	V_{DS}=−10V, f=1MHz		115		pF
Output Capacitance	Coss	V_{DS}=−10V, f=1MHz		23		pF
Reverse Transfer Capacitance	Crss	V_{DS}=−10V, f=1MHz		15		pF

Marking : BV

Continued on next page.

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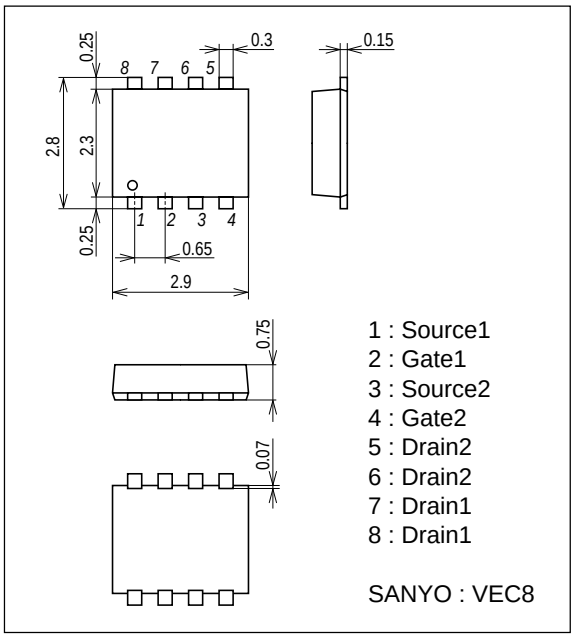
Continued from preceding page.

Parameter	Symbol	Conditions	Ratings			Unit
			min	typ	max	
Turn-ON Delay Time	$t_{d(on)}$	See specified Test Circuit.		8		ns
Rise Time	t_r	See specified Test Circuit.		11		ns
Turn-OFF Delay Time	$t_{d(off)}$	See specified Test Circuit.		17		ns
Fall Time	t_f	See specified Test Circuit.		13		ns
Total Gate Charge	Qg	V_{DS}=-10V, V_{GS}=-4V, I_D=-1A		1.5		nC
Gate-to-Source Charge	Qgs	V_{DS}=-10V, V_{GS}=-4V, I_D=-1A		0.4		nC
Gate-to-Drain “Miller” Charge	Qgd	V_{DS}=-10V, V_{GS}=-4V, I_D=-1A		0.3		nC
Diode Forward Voltage	V_{SD}	I_S=-1A, V_{GS}=0		-0.89	-1.2	V
[N-channel]						
Drain-to-Source Breakdown Voltage	$V_{(BR)DSS}$	I_D=1mA, V_{GS}=0	20			V
Zero-Gate Voltage Drain Current	I_{DSS}	V_{DS}=20V, V_{GS}=0			1	μA
Gate-to-Source Leakage Current	I_{GSS}	V_{GS}=±8V, V_{DS}=0			±10	μA
Cutoff Voltage	$V_{GS(off)}$	V_{DS}=10V, I_D=1mA	0.5		1.3	V
Forward Transfer Admittance	$\|yfs\|$	V_{DS}=10V, I_D=1.5A	3.2	5.4		S
Static Drain-to-Source On-State Resistance	$R_{DS(on)1}$	I_D=2A, V_{GS}=4V		44	58	mΩ
	$R_{DS(on)2}$	I_D=1A, V_{GS}=2.5V		51	73	mΩ
Input Capacitance	Ciss	V_{DS}=10V, f=1MHz		570		pF
Output Capacitance	Coss	V_{DS}=10V, f=1MHz		110		pF
Reverse Transfer Capacitance	Crss	V_{DS}=10V, f=1MHz		80		pF
Turn-ON Delay Time	$t_{d(on)}$	See specified Test Circuit.		13.5		ns
Rise Time	t_r	See specified Test Circuit.		55		ns
Turn-OFF Delay Time	$t_{d(off)}$	See specified Test Circuit.		80		ns
Fall Time	t_f	See specified Test Circuit.		70		ns
Total Gate Charge	Qg	V_{DS}=10V, V_{GS}=4V, I_D=3A		7.6		nC
Gate-to-Source Charge	Qgs	V_{DS}=10V, V_{GS}=4V, I_D=3A		1.2		nC
Gate-to-Drain “Miller” Charge	Qgd	V_{DS}=10V, V_{GS}=4V, I_D=3A		2.1		nC
Diode Forward Voltage	V_{SD}	I_S=3A, V_{GS}=0		0.85	1.2	V

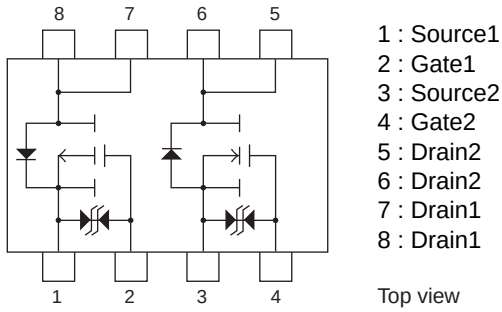
Package Dimensions

unit : mm

2227A

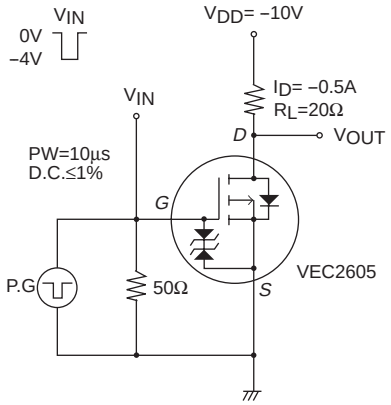


Electrical Connection

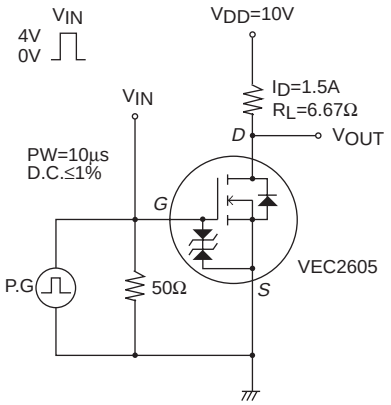


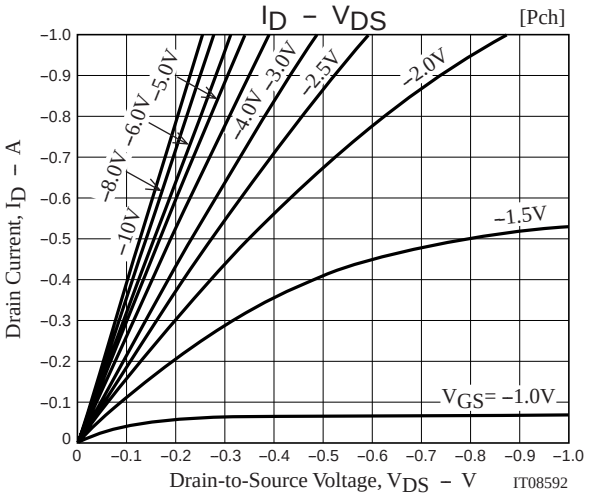
Switching Time Test Circuit

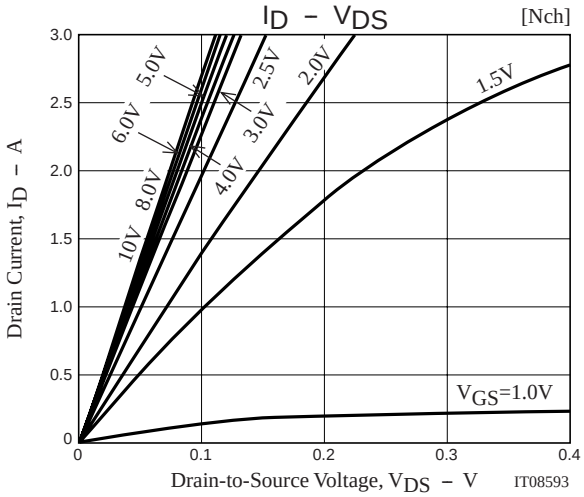
[P-channel]

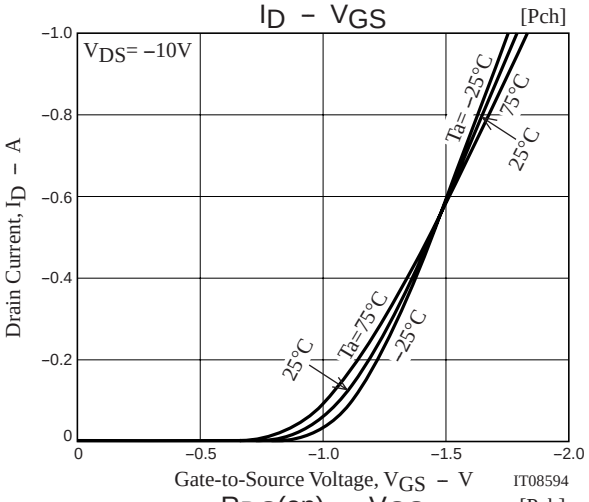


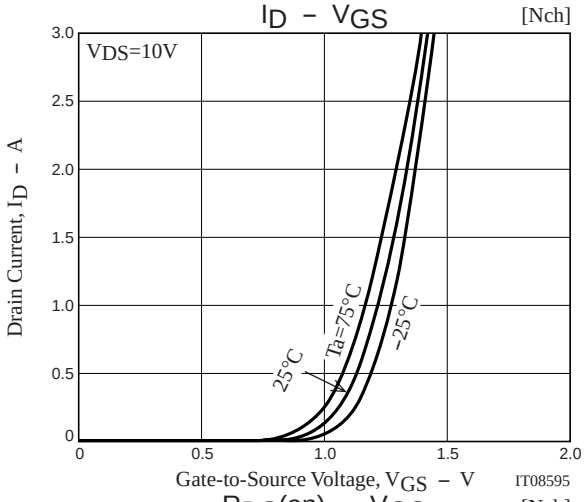
[N-channel]

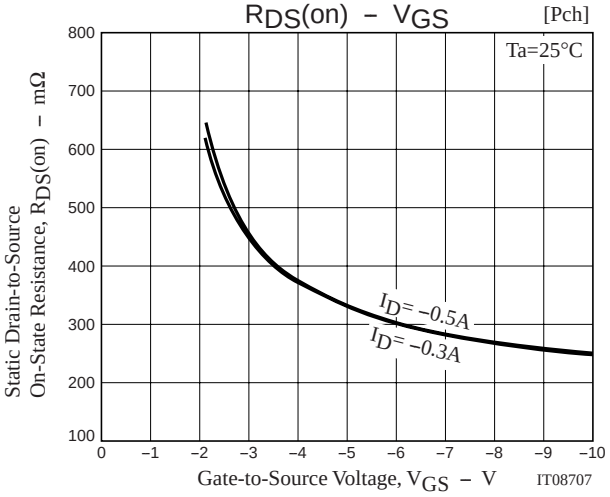


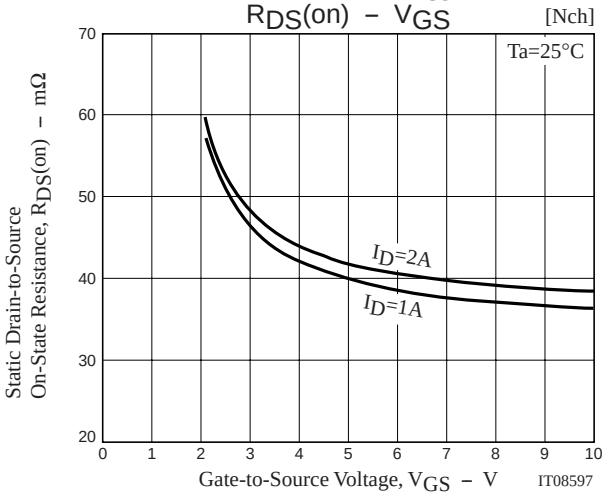


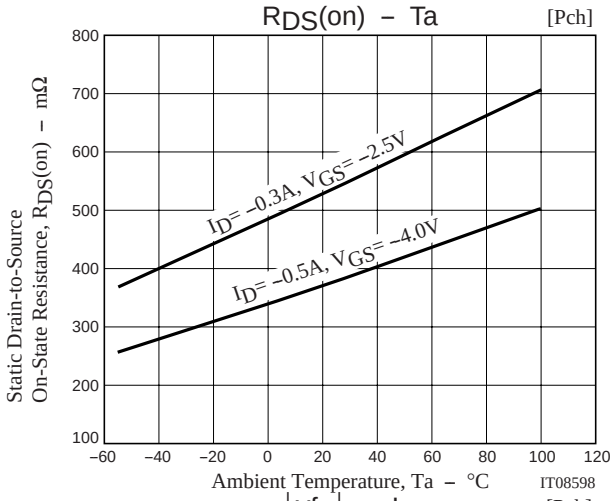


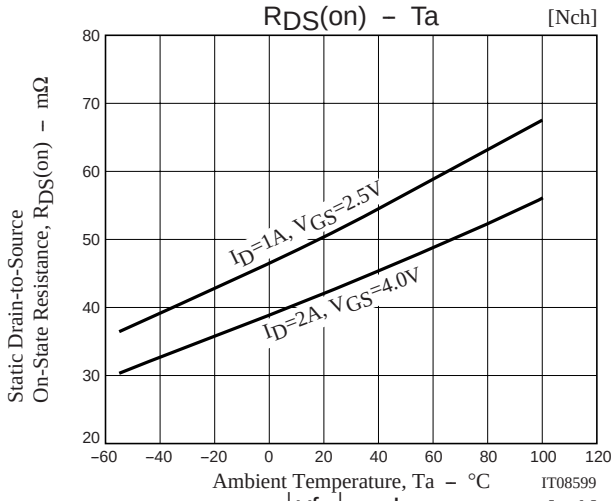


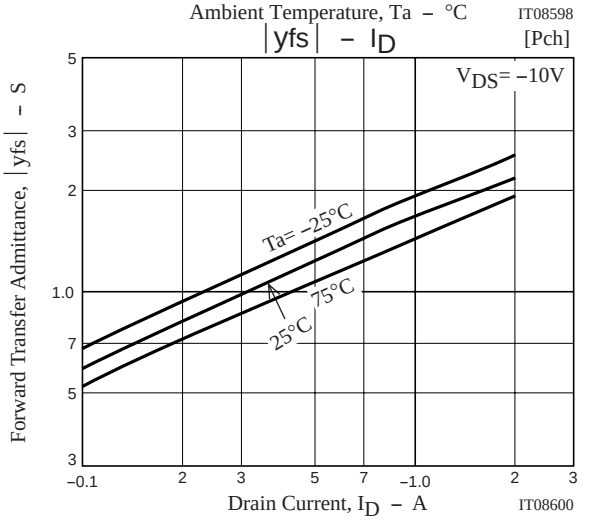


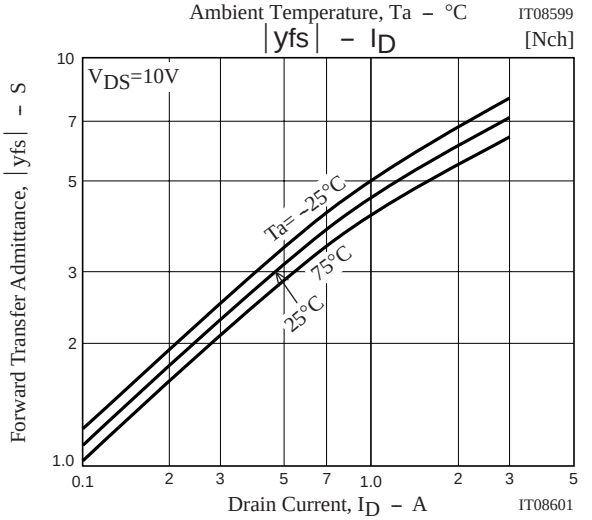





RDS(on) – Ta
[Pch]
Static Drain-to-Source On-State Resistance, RDS(on) – mΩ
ID= –0.3A, VGS= –2.5V
ID= –0.5A, VGS= –4.0V
Ambient Temperature, Ta – °C
IT08598


RDS(on) – Ta
[Nch]
Static Drain-to-Source On-State Resistance, RDS(on) – mΩ
ID=1A, VGS=2.5V
ID=2A, VGS=4.0V
Ambient Temperature, Ta – °C
IT08599


|yfs| – ID
[Pch]
VDS= –10V
Forward Transfer Admittance, |yfs| – S
Ta= –25°C
75°C
25°C
Drain Current, ID – A
IT08600


|yfs| – ID
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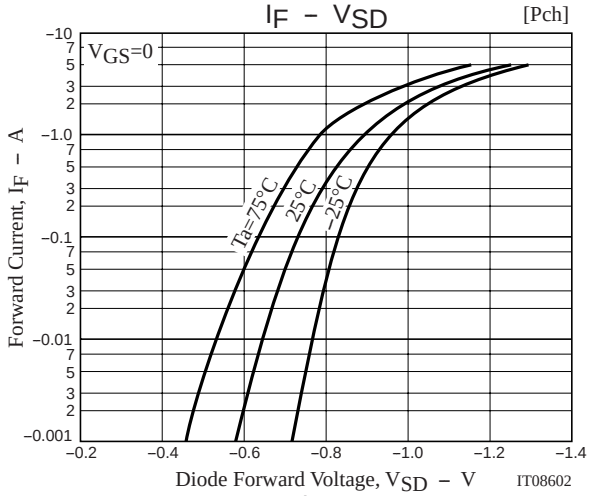
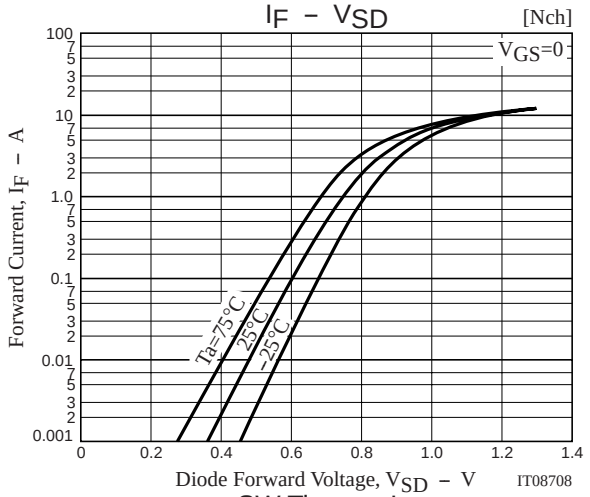
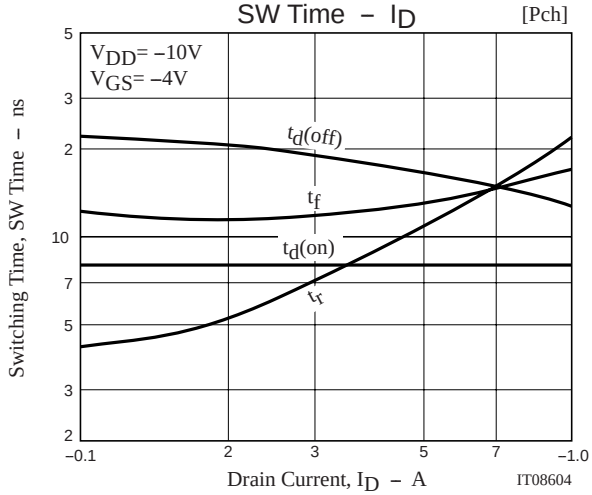
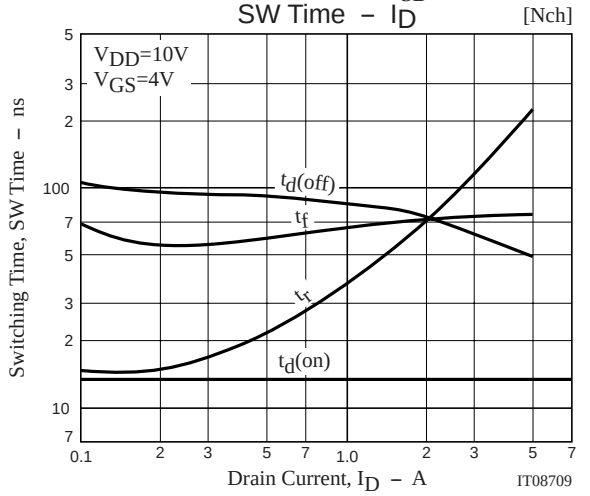
VDS=10V
Forward Transfer Admittance, |yfs| – S
Ta= –25°C
75°C
25°C
Drain Current, ID – A
IT08601

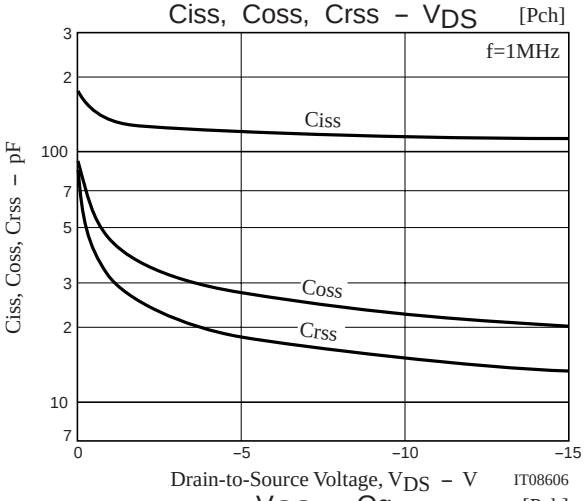

IF – VSD
[Pch]
VGS=0
Forward Current, IF – A
Ta=75°C
25°C
–25°C
Diode Forward Voltage, VSD – V
IT08602


IF – VSD
[Nch]
VGS=0
Forward Current, IF – A
Ta=75°C
25°C
–25°C
Diode Forward Voltage, VSD – V
IT08708

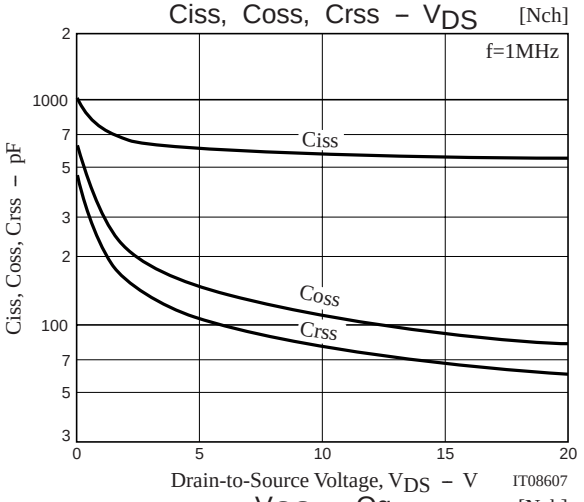

SW Time – ID
[Pch]
VDD= –10V
VGS= –4V
Switching Time, SW Time – ns
td(off)
tf
td(on)
tr
Drain Current, ID – A
IT08604


SW Time – ID
[Nch]
VDD=10V
VGS=4V
Switching Time, SW Time – ns
td(off)
tf
tr
td(on)
Drain Current, ID – A
IT08709

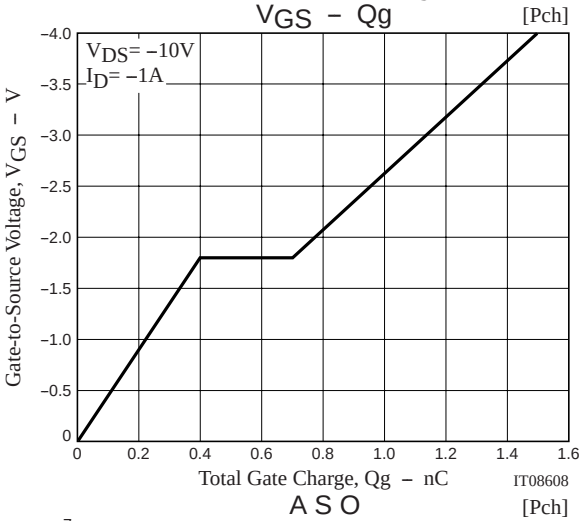
Ciss, Coss, Crss – V_{DS} [Pch]



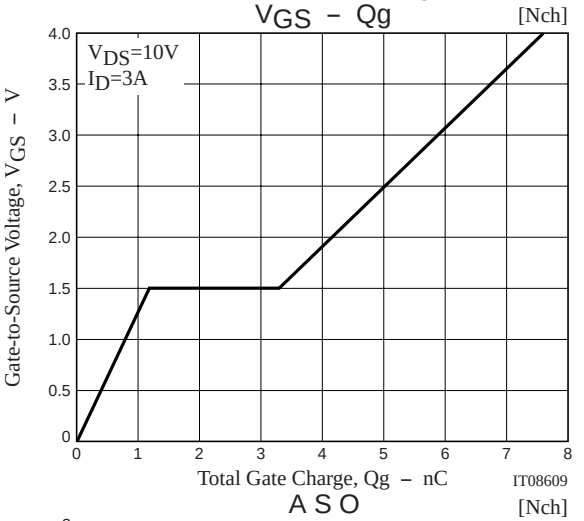
Ciss, Coss, Crss – V_{DS} [Nch]



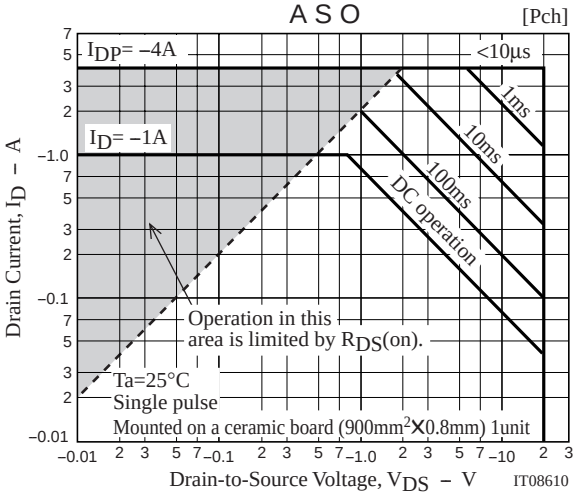
V_{GS} – Qg [Pch]



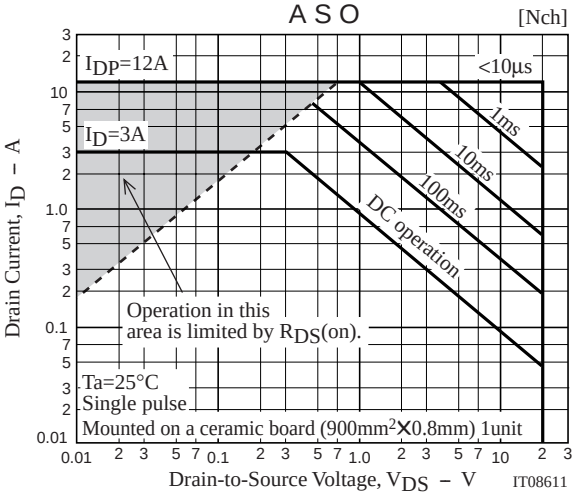
V_{GS} – Qg [Nch]



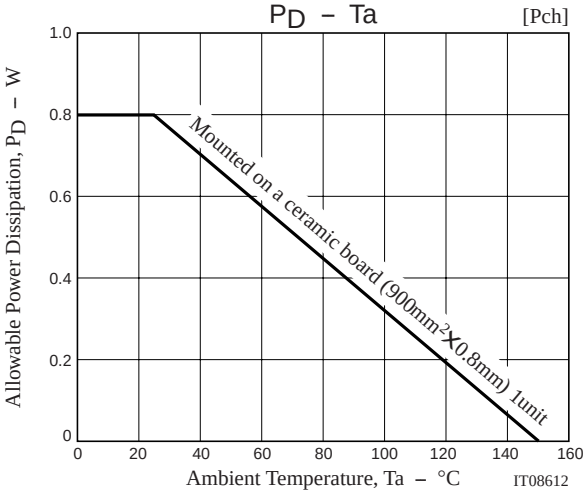
A S O [Pch]



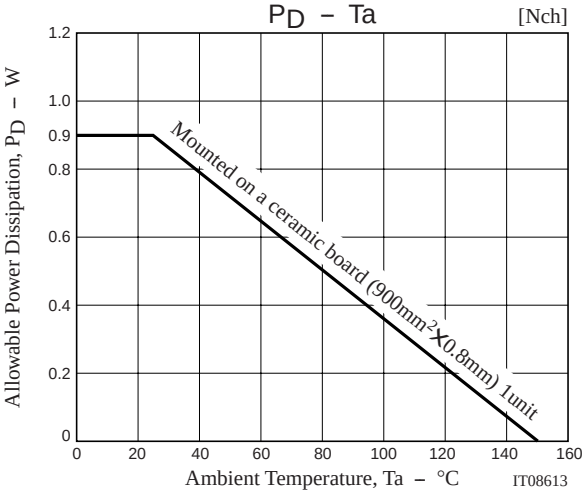
A S O [Nch]



P_D – Ta [Pch]



P_D – Ta [Nch]



Note on usage : Since the VEC2605 is a MOSFET product, please avoid using this device in the vicinity of highly charged objects.

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