



VEC2603 — N-Channel and P-Channel Silicon MOSFETs

General-Purpose Switching Device Applications

Features

- A composite type of a low on-resistance P-channel MOSFET and a small signal N-channel MOSFET for driving P-channel MOSFET enables high-density mounting.
- Best suited for load switches.
- 1.8V drive.
- 0.75mm mount high.

Specifications

Absolute Maximum Ratings at $T_a=25^\circ\text{C}$

Parameter	Symbol	Conditions	N-channel	P-channel	Unit
Drain-to-Source Voltage	V_{DSS}		30	-12	V
Gate-to-Source Voltage	V_{GSS}		± 10	± 8	V
Drain Current (DC)	I_D		0.15	-4	A
Drain Current (Pulse)	I_{DP}	$PW \leq 10\mu\text{s}$, duty cycle $\leq 1\%$	0.6	-16	A
Allowable Power Dissipation	P_D	Mounted on a ceramic board (900mm ² X0.8mm)1unit	0.9		W
Channel Temperature	T_{ch}		150		$^\circ\text{C}$
Storage Temperature	T_{stg}		-55 to +150		$^\circ\text{C}$

Electrical Characteristics at $T_a=25^\circ\text{C}$

Parameter	Symbol	Conditions	Ratings			Unit
			min	typ	max	
[N-channel]						
Drain-to-Source Breakdown Voltage	$V_{(BR)DSS}$	$I_D=1\text{mA}$, $V_{GS}=0\text{V}$	30			V
Zero-Gate Voltage Drain Current	I_{DSS}	$V_{DS}=30\text{V}$, $V_{GS}=0\text{V}$			1	μA
Gate-to-Source Leakage Current	I_{GSS}	$V_{GS}=\pm 8\text{V}$, $V_{DS}=0\text{V}$			± 10	μA
Cutoff Voltage	$V_{GS(off)}$	$V_{DS}=10\text{V}$, $I_D=100\mu\text{A}$	0.4		1.3	V
Forward Transfer Admittance	$ y_{fs} $	$V_{DS}=10\text{V}$, $I_D=80\text{mA}$	0.15	0.22		S

Marking : BF

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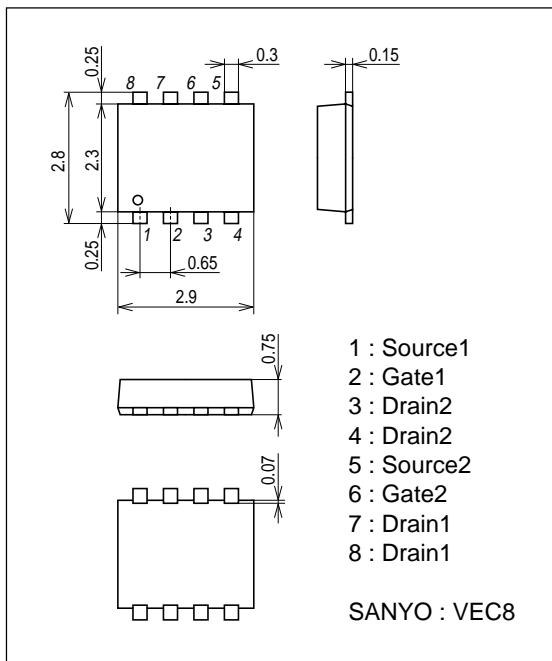
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Parameter	Symbol	Conditions	Ratings			Unit
			min	typ	max	
Static Drain-to-Source On-State Resistance	R _{DS(on)1}	I _D =80mA, V _{GS} =4V		2.9	3.7	Ω
	R _{DS(on)2}	I _D =40mA, V _{GS} =2.5V		3.7	5.2	Ω
	R _{DS(on)3}	I _D =10mA, V _{GS} =1.5V		6.4	12.8	Ω
Input Capacitance	C _{iss}	V _{DS} =10V, f=1MHz		7.0		pF
Output Capacitance	C _{oss}	V _{DS} =10V, f=1MHz		5.9		pF
Reverse Transfer Capacitance	C _{rss}	V _{DS} =10V, f=1MHz		2.3		pF
Turn-ON Delay Time	t _{d(on)}	See specified Test Circuit.		19		ns
Rise Time	t _r	See specified Test Circuit.		65		ns
Turn-OFF Delay Time	t _{d(off)}	See specified Test Circuit.		155		ns
Fall Time	t _f	See specified Test Circuit.		120		ns
Total Gate Charge	Q _g	V _{DS} =10V, V _{GS} =10V, I _D =150mA		1.58		nC
Gate-to-Source Charge	Q _{gs}	V _{DS} =10V, V _{GS} =10V, I _D =150mA		0.26		nC
Gate-to-Drain "Miller" Charge	Q _{gd}	V _{DS} =10V, V _{GS} =10V, I _D =150mA		0.31		nC
Diode Forward Voltage	V _{SD}	I _S =150mA, 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} =±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 =-2A	4.5	7.6		S
Static Drain-to-Source On-State Resistance	R _{DS(on)1}	I _D =-2A, V _{GS} =-4.5V		40	53	mΩ
	R _{DS(on)2}	I _D =-1A, V _{GS} =-2.5V		57	80	mΩ
	R _{DS(on)3}	I _D =-0.3A, V _{GS} =-1.8V		78	112	mΩ
Input Capacitance	C _{iss}	V _{DS} =-6V, f=1MHz		940		pF
Output Capacitance	C _{oss}	V _{DS} =-6V, f=1MHz		230		pF
Reverse Transfer Capacitance	C _{rss}	V _{DS} =-6V, f=1MHz		180		pF
Turn-ON Delay Time	t _{d(on)}	See specified Test Circuit.		14		ns
Rise Time	t _r	See specified Test Circuit.		120		ns
Turn-OFF Delay Time	t _{d(off)}	See specified Test Circuit.		97		ns
Fall Time	t _f	See specified Test Circuit.		110		ns
Total Gate Charge	Q _g	V _{DS} =-6V, V _{GS} =-4.5V, I _D =-4A		11		nC
Gate-to-Source Charge	Q _{gs}	V _{DS} =-6V, V _{GS} =-4.5V, I _D =-4A		1.6		nC
Gate-to-Drain "Miller" Charge	Q _{gd}	V _{DS} =-6V, V _{GS} =-4.5V, I _D =-4A		2.8		nC
Diode Forward Voltage	V _{SD}	I _S =-4A, V _{GS} =0V		-0.85	-1.5	V

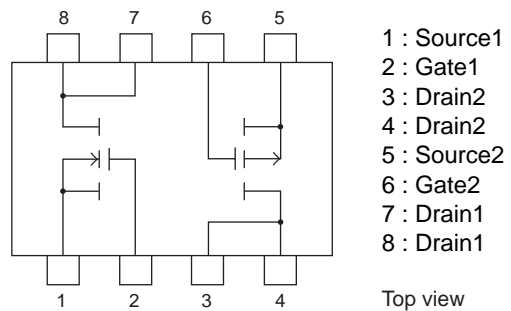
Package Dimensions

unit : mm (typ)

7012-009



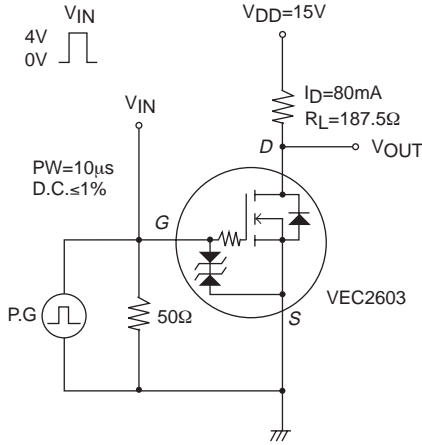
Electrical Connection



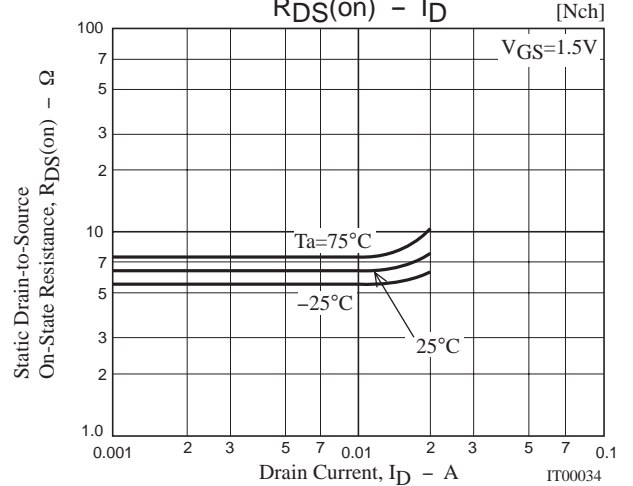
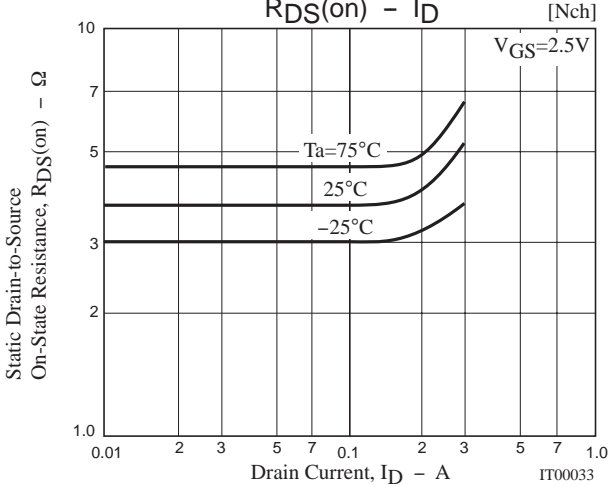
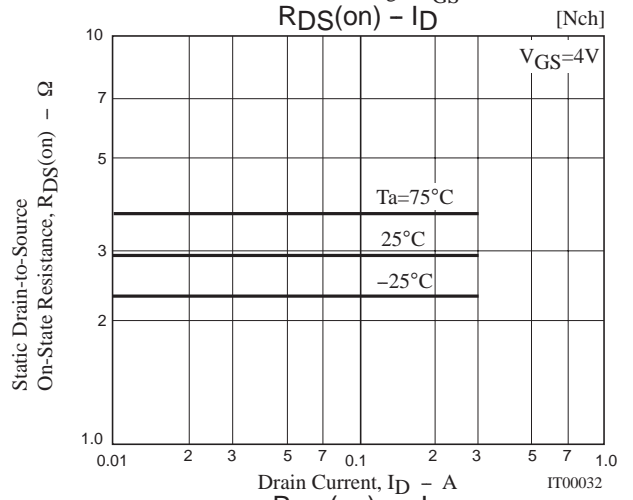
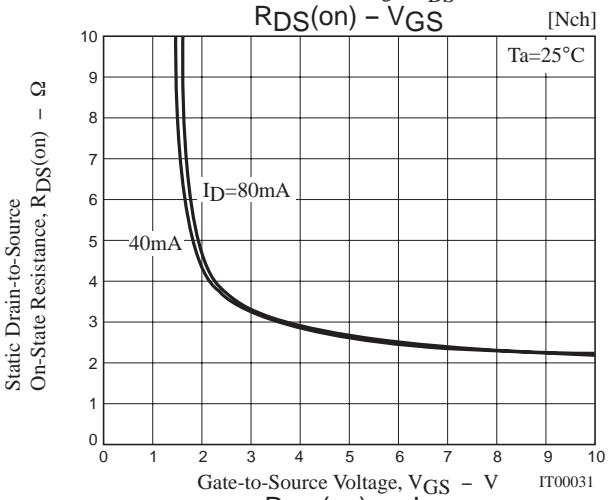
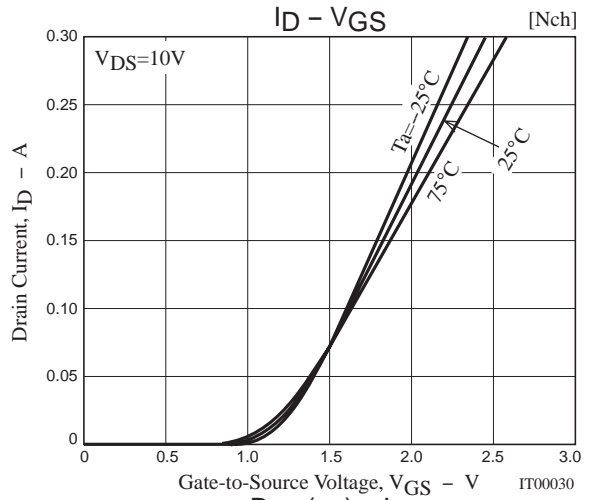
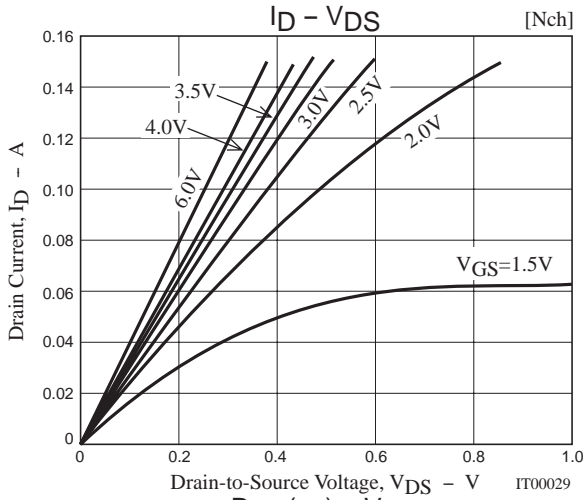
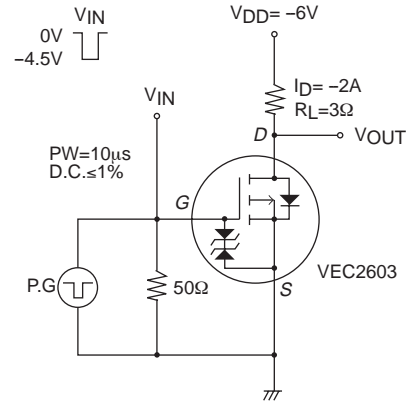
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Switching Time Test Circuit

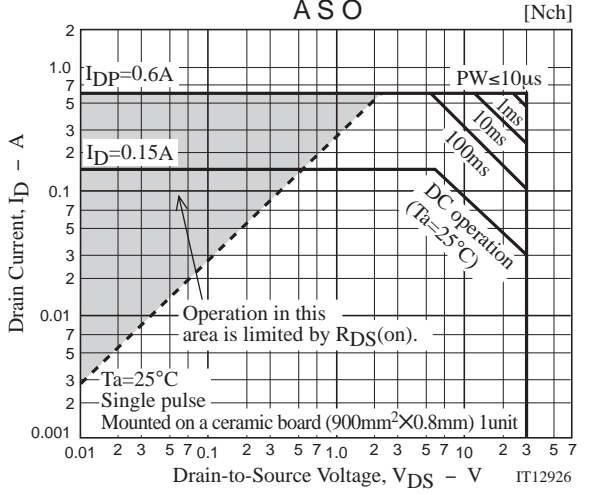
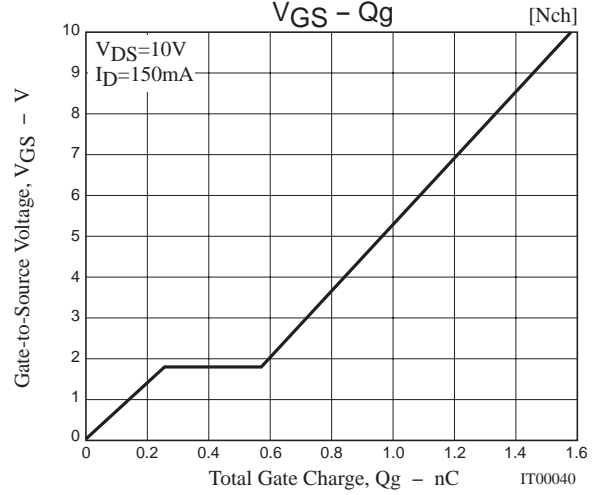
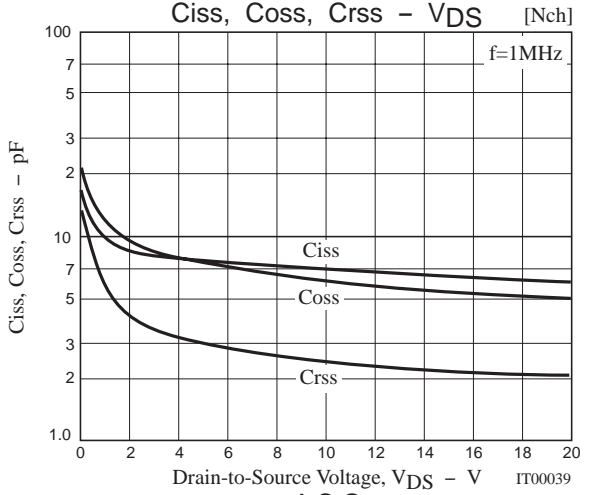
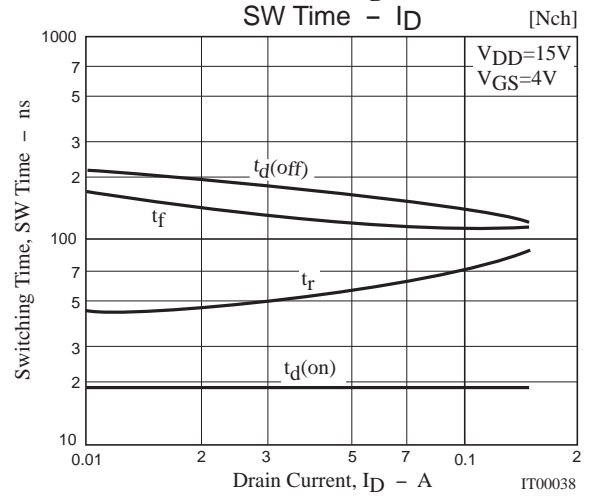
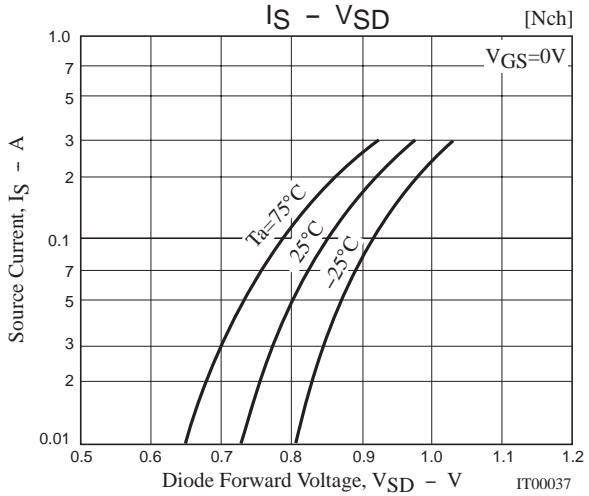
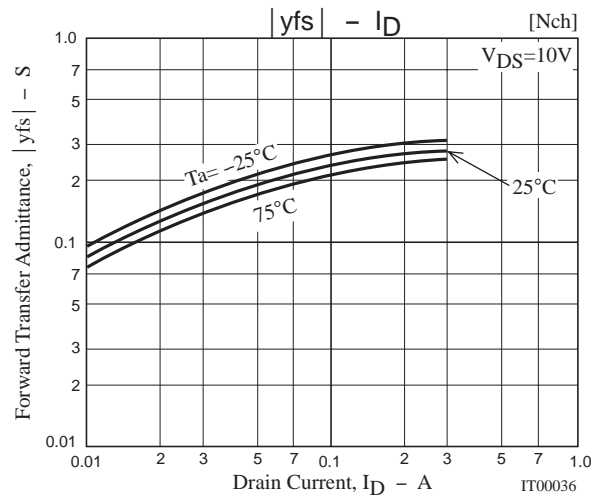
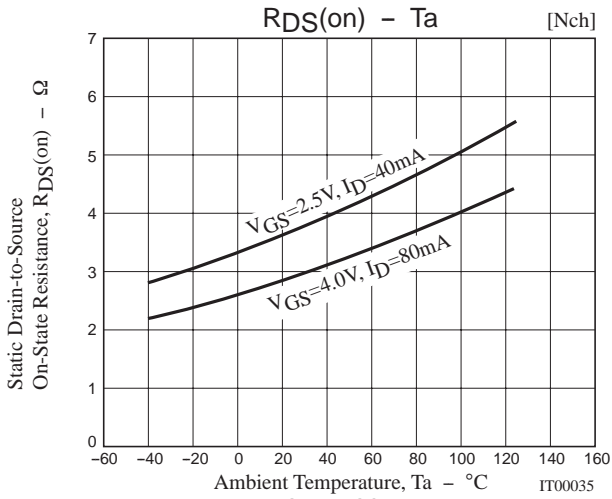
[N-channel]



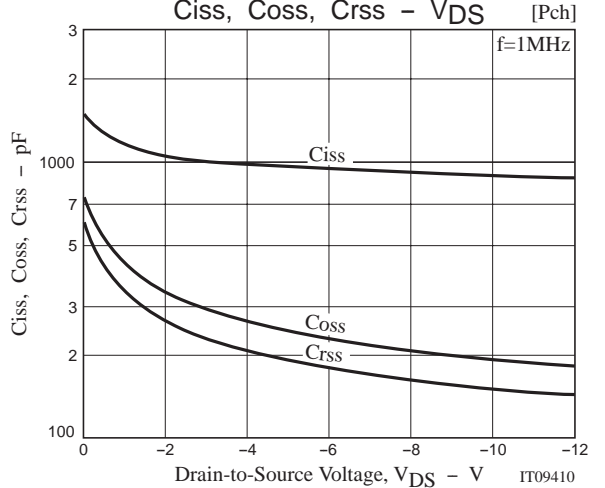
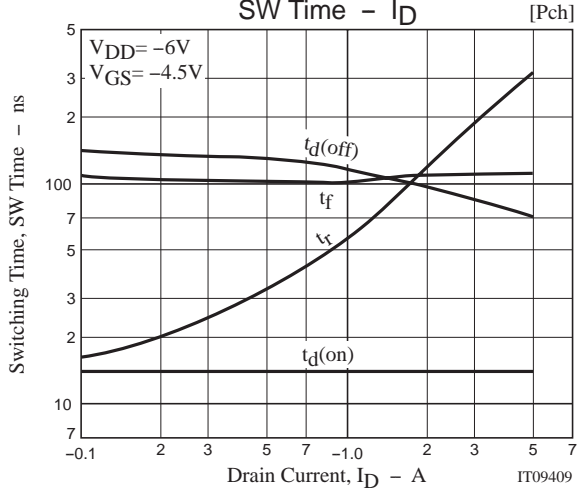
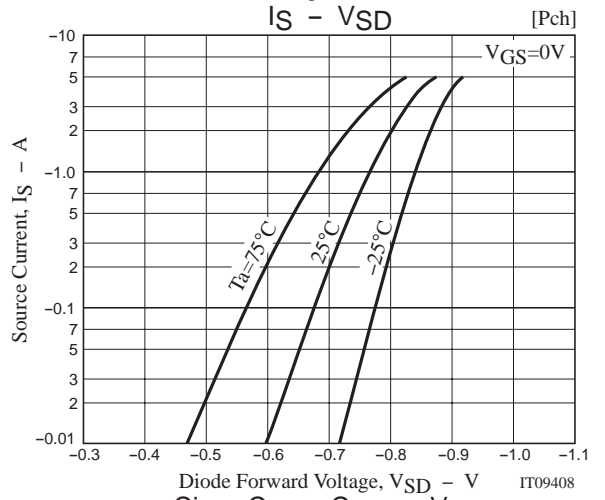
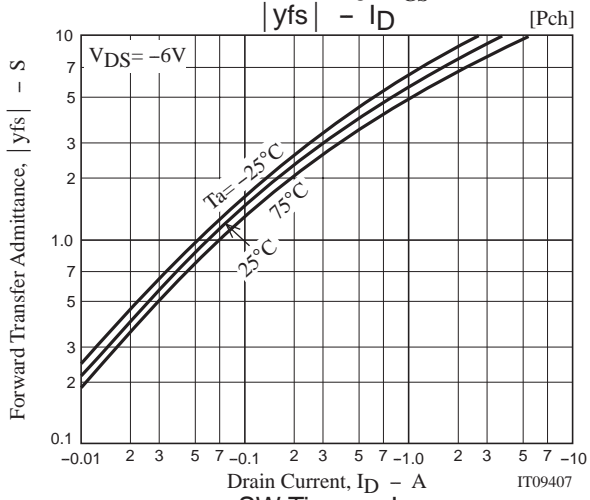
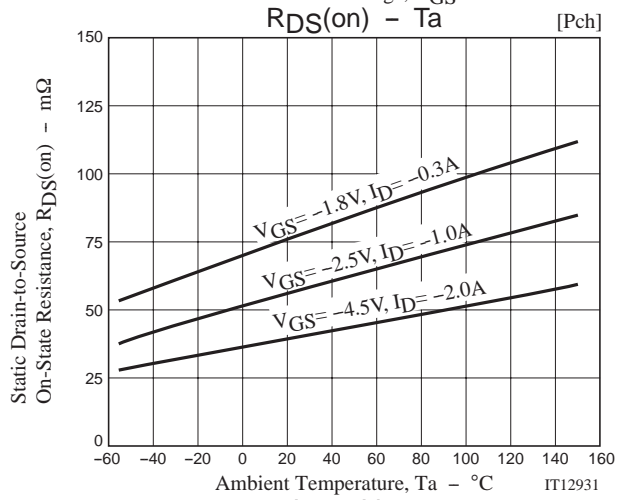
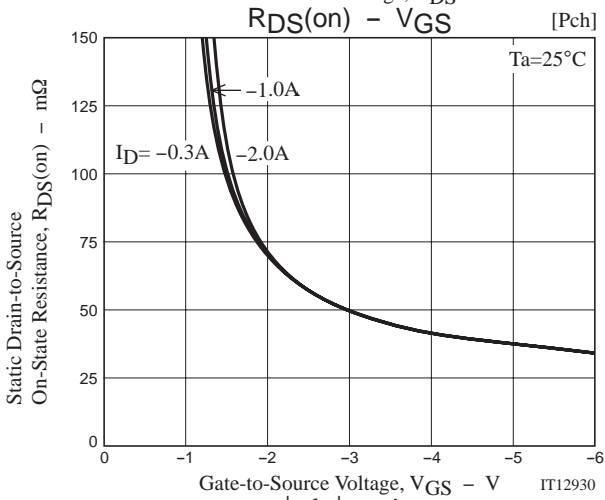
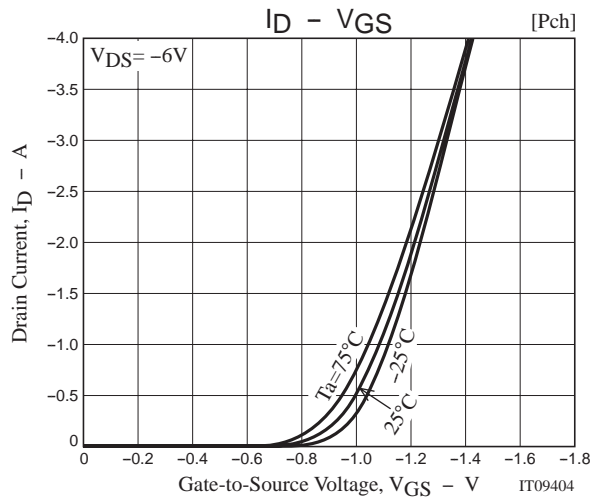
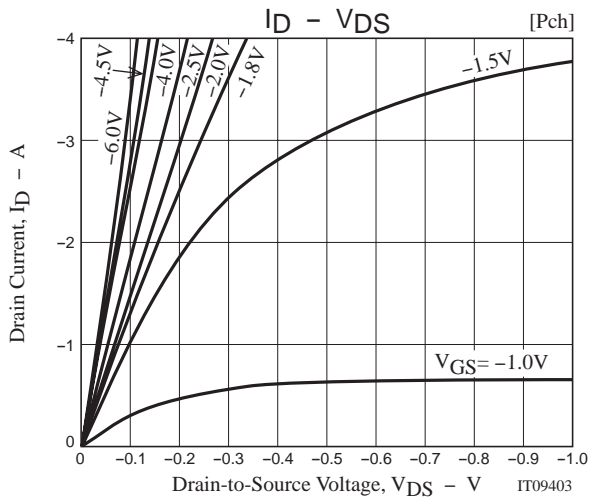
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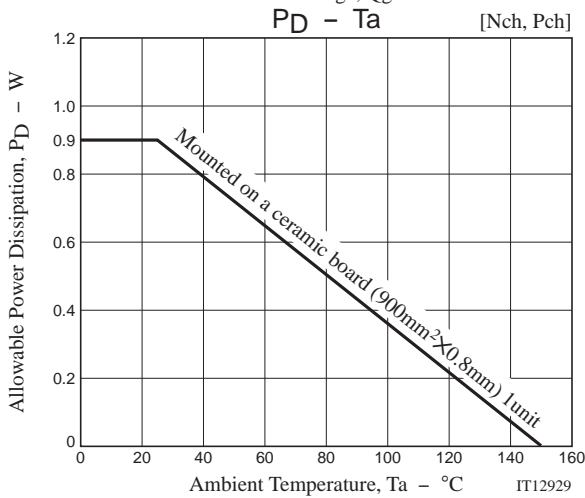
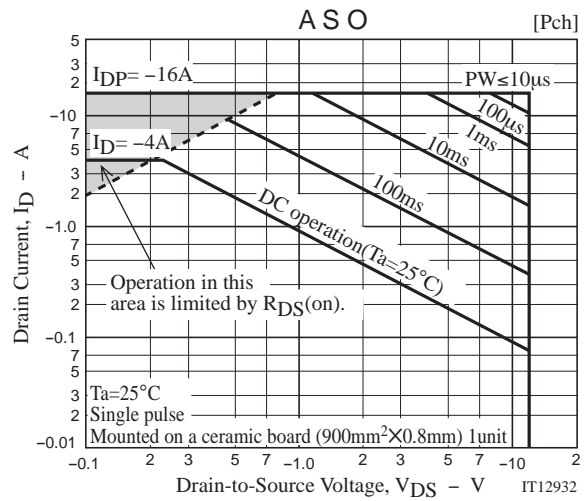
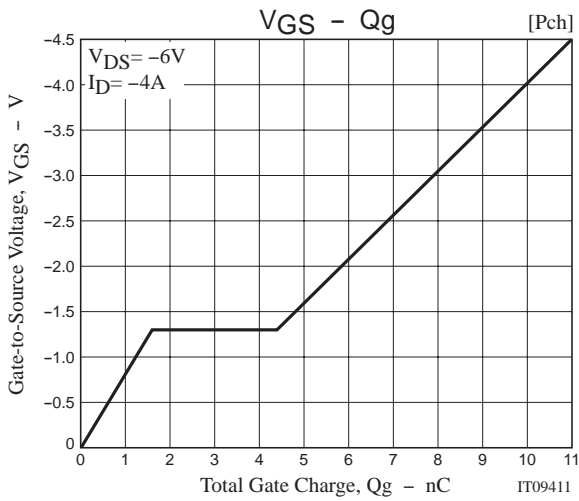


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Note on usage : Since the VEC2603 is a MOSFET product, please avoid using this device in the vicinity of highly charged objects.

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