Ordering number : ENA1822

SANYO Semiconductors

DATA SHEET

An ON Semiconductor Company

N-Channel and P-Channel Silicon MOSFETs

VEC2616 — General-Purpose Switching Device Applications

Features

- ON-resistance Nch: $R_{DS}(on)1$=62mΩ(typ.), Pch: $R_{DS}(on)1$=105mΩ(typ.)
- 4V drive
- N-channel MOSFET + P-channel MOSFET

Specifications

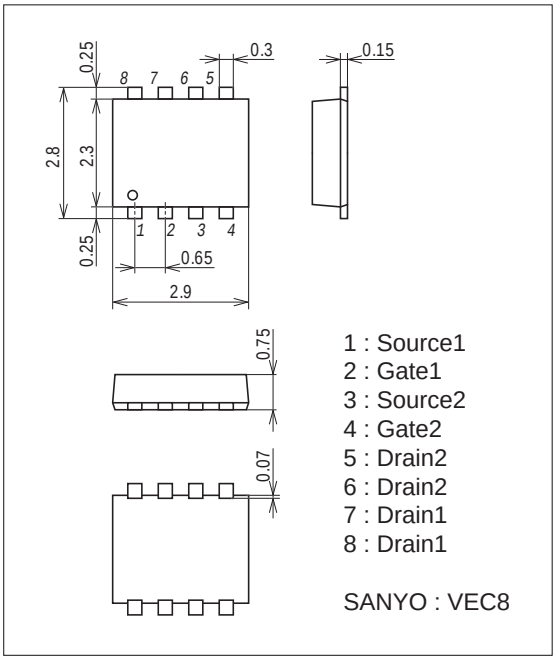
Absolute Maximum Ratings at Ta=25°C

Parameter	Symbol	Conditions	N-channel	P-channel	Unit
Drain-to-Source Voltage	V_{DSS}		60	−60	V
Gate-to-Source Voltage	V_{GSS}		±20	±20	V
Drain Current (DC)	I_D		3	−2.5	A
Drain Current (Pulse)	I_{DP}	PW≤10μs, duty cycle≤1%	12	−10	A
Allowable Power Dissipation	P_D	When mounted on ceramic substrate (900mm²×0.8mm) 1unit	0.9		W
Total Dissipation	P_T	When mounted on ceramic substrate (900mm²×0.8mm)	1.0		W
Channel Temperature	Tch		150		°C
Storage Temperature	Tstg		−55 to +150		°C

Package Dimensions

unit : mm (typ)

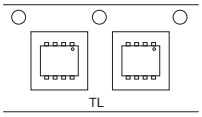
7012-002



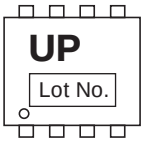
Product & Package Information

- Package : VEC8
- JEITA, JEDEC : -
- Minimum Packing Quantity : 3,000 pcs./reel

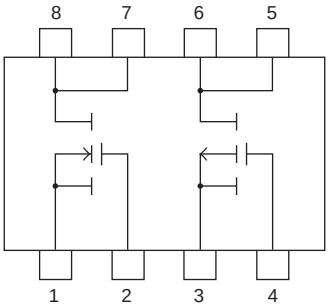
Packing Type : TL



Marking



Electrical Connection

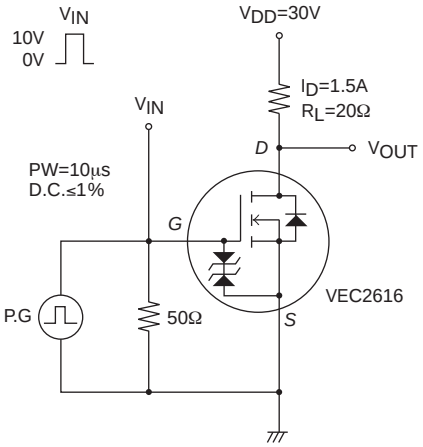


Electrical Characteristics at Ta=25°C

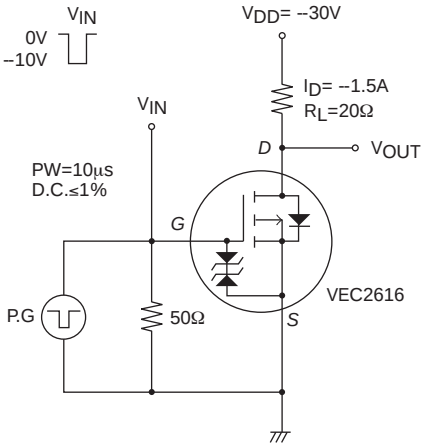
Parameter	Symbol	Conditions	Ratings			Unit
			min	typ	max	
[N-channel]						
Drain-to-Source Breakdown Voltage	$V_{(BR)DSS}$	I_D=1mA, V_{GS}=0V	60			V
Zero-Gate Voltage Drain Current	I_{DSS}	V_{DS}=60V, V_{GS}=0V			1	μA
Gate-to-Source Leakage Current	I_{GSS}	V_{GS}=±16V, V_{DS}=0V			±10	μA
Cutoff Voltage	V_{GS}(off)	V_{DS}=10V, I_D=1mA	1.2		2.6	V
Forward Transfer Admittance	| yfs |	V_{DS}=10V, I_D=1.5A		2.6		S
Static Drain-to-Source On-State Resistance	R_{DS}(on)1	I_D=1.5A, V_{GS}=10V		62	80	mΩ
	R_{DS}(on)2	I_D=0.75A, V_{GS}=4.5V		76	106	mΩ
	R_{DS}(on)3	I_D=0.75A, V_{GS}=4V		83	116	mΩ
Input Capacitance	Ciss	V_{DS}=20V, f=1MHz		505		pF
Output Capacitance	Coss	V_{DS}=20V, f=1MHz		57		pF
Reverse Transfer Capacitance	Crss	V_{DS}=20V, f=1MHz		37		pF
Turn-ON Delay Time	t_d(on)	See specified Test Circuit.		7.3		ns
Rise Time	t_r	See specified Test Circuit.		7.5		ns
Turn-OFF Delay Time	t_d(off)	See specified Test Circuit.		41		ns
Fall Time	t_f	See specified Test Circuit.		22		ns
Total Gate Charge	Qg	V_{DS}=30V, V_{GS}=10V, I_D=3A		10		nC
Gate-to-Source Charge	Qgs	V_{DS}=30V, V_{GS}=10V, I_D=3A		1.6		nC
Gate-to-Drain “Miller” Charge	Qgd	V_{DS}=30V, V_{GS}=10V, I_D=3A		2.1		nC
Diode Forward Voltage	V_{SD}	I_S=3A, V_{GS}=0V		0.81	1.2	V
[P-channel]						
Drain-to-Source Breakdown Voltage	$V_{(BR)DSS}$	I_D=−1mA, V_{GS}=0V	−60			V
Zero-Gate Voltage Drain Current	I_{DSS}	V_{DS}=−60V, 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	| yfs |	V_{DS}=−10V, I_D=−1.5A		3.9		S
Static Drain-to-Source On-State Resistance	R_{DS}(on)1	I_D=−1.5A, V_{GS}=−10V		105	137	mΩ
	R_{DS}(on)2	I_D=−0.75A, V_{GS}=−4.5V		128	180	mΩ
	R_{DS}(on)3	I_D=−0.75A, V_{GS}=−4V		138	194	mΩ
Input Capacitance	Ciss	V_{DS}=−20V, f=1MHz		420		pF
Output Capacitance	Coss	V_{DS}=−20V, f=1MHz		54		pF
Reverse Transfer Capacitance	Crss	V_{DS}=−20V, f=1MHz		44		pF
Turn-ON Delay Time	t_d(on)	See specified Test Circuit.		6.4		ns
Rise Time	t_r	See specified Test Circuit.		9.8		ns
Turn-OFF Delay Time	t_d(off)	See specified Test Circuit.		65		ns
Fall Time	t_f	See specified Test Circuit.		36		ns
Total Gate Charge	Qg	V_{DS}=−30V, V_{GS}=−10V, I_D=−2.5A		11		nC
Gate-to-Source Charge	Qgs	V_{DS}=−30V, V_{GS}=−10V, I_D=−2.5A		1.4		nC
Gate-to-Drain “Miller” Charge	Qgd	V_{DS}=−30V, V_{GS}=−10V, I_D=−2.5A		2		nC
Diode Forward Voltage	V_{SD}	I_S=−2.5A, V_{GS}=0V		−0.83	−1.2	V

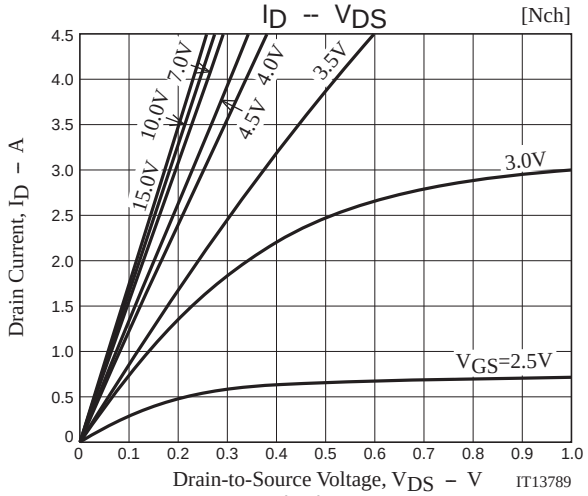
Switching Time Test Circuit

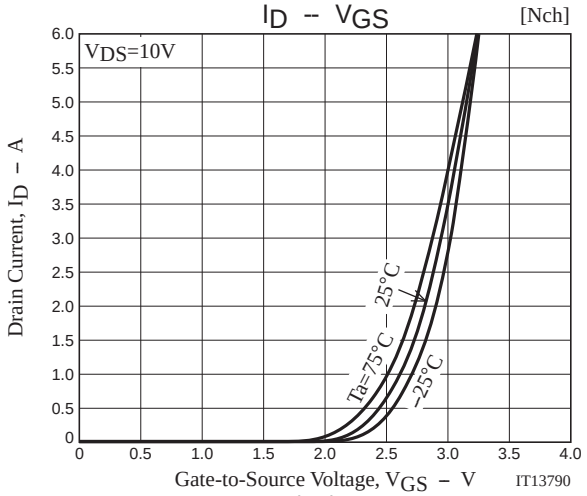
[N-channel]

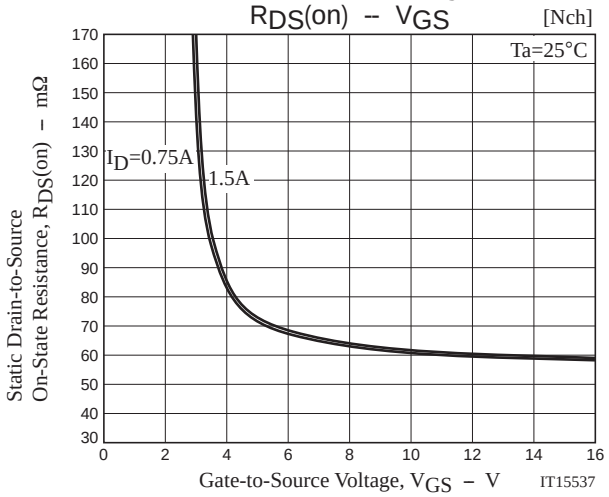


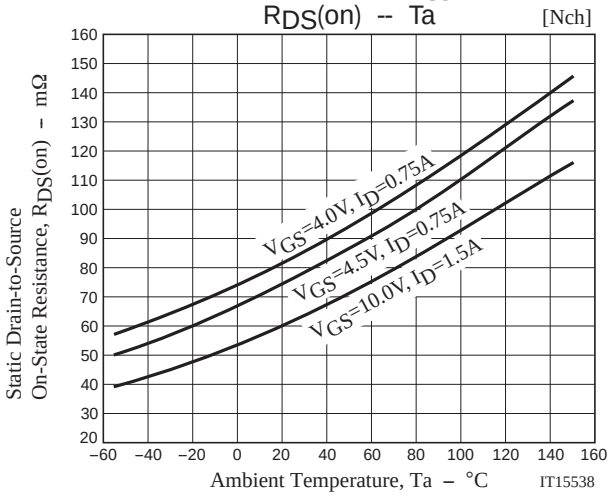
[P-channel]

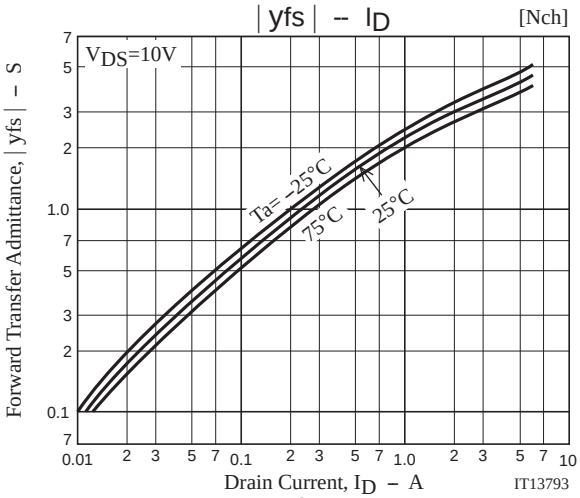


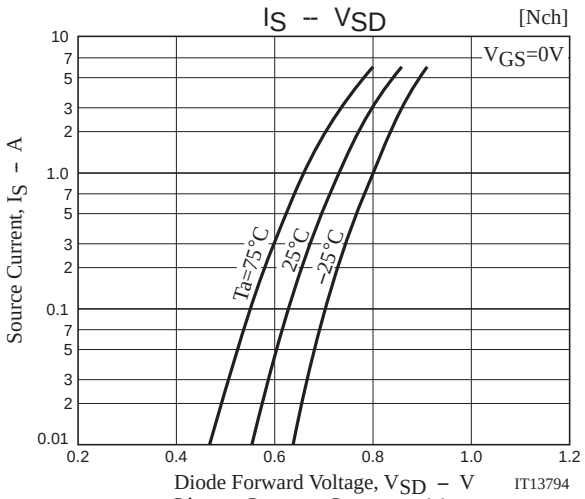


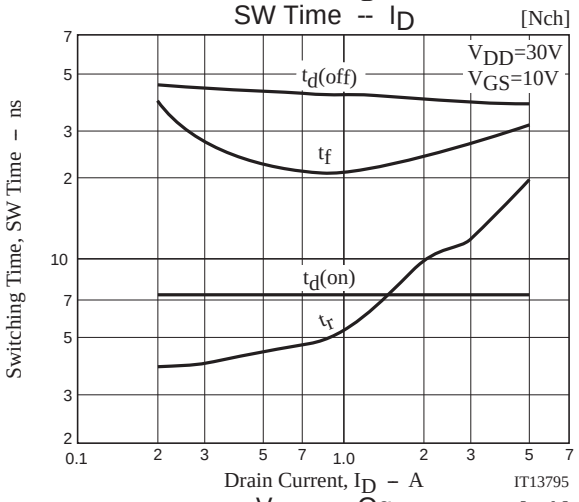


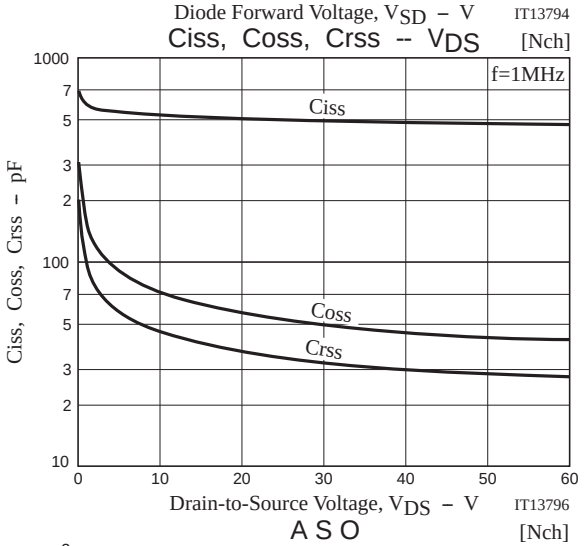


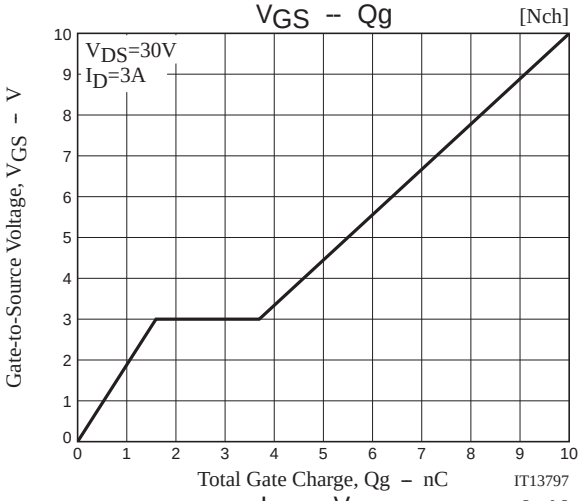


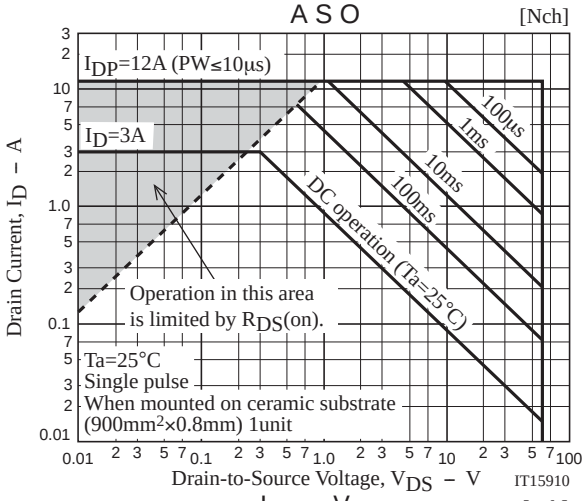

| yfs | -- ID
[Nch]
VDS=10V
Ta= –25°C
75°C
25°C
Forward Transfer Admittance, | yfs | – S
Drain Current, ID – A
IT13793

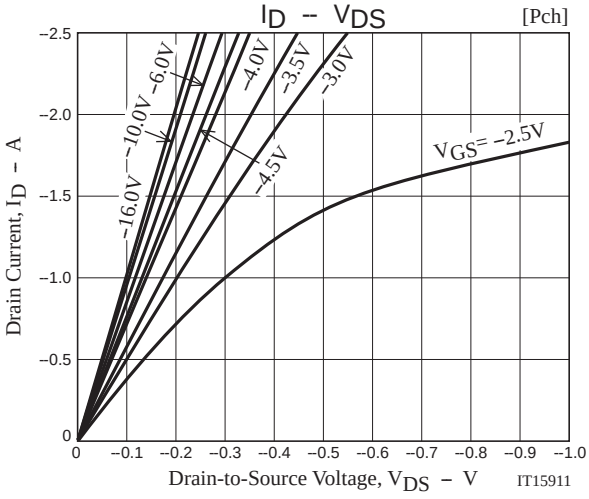

IS -- VSD
[Nch]
VGS=0V
Ta=75°C
25°C
–25°C
Source Current, IS – A
Diode Forward Voltage, VSD – V
IT13794

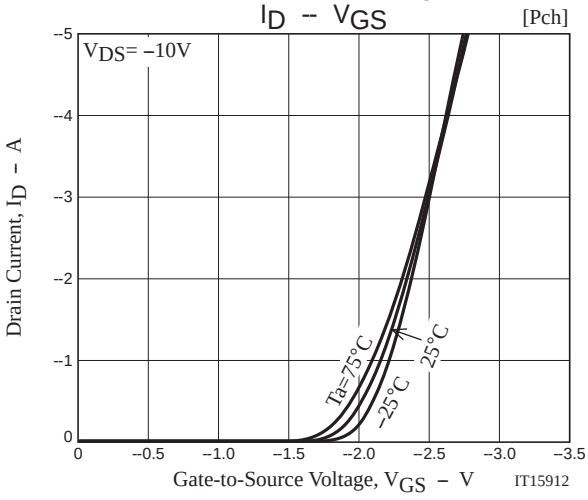

SW Time -- ID
[Nch]
VDD=30V
VGS=10V
td(off)
tf
td(on)
tr
Switching Time, SW Time – ns
Drain Current, ID – A
IT13795

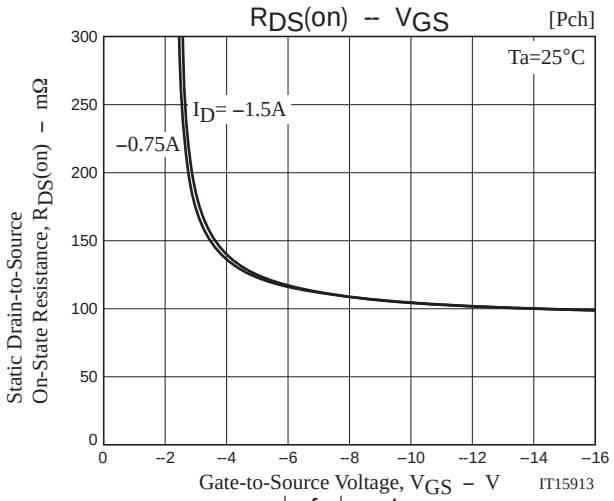

Ciss, Coss, Crss -- VDS
[Nch]
f=1MHz
Ciss
Coss
Crss
Ciss, Coss, Crss – pF
Drain-to-Source Voltage, VDS – V
IT13796

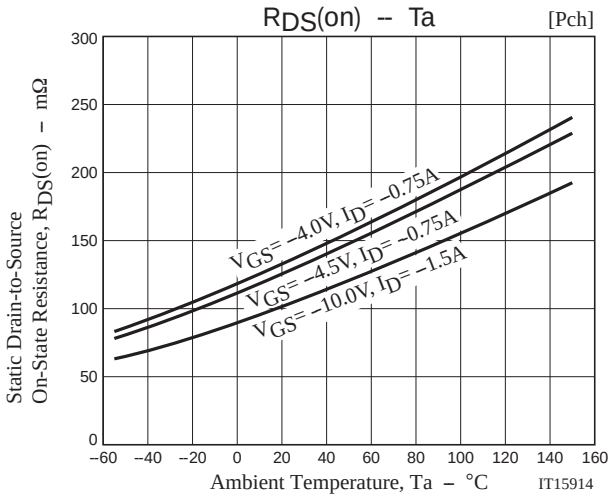

VGS -- Qg
[Nch]
VDS=30V
ID=3A
Gate-to-Source Voltage, VGS – V
Total Gate Charge, Qg – nC
IT13797

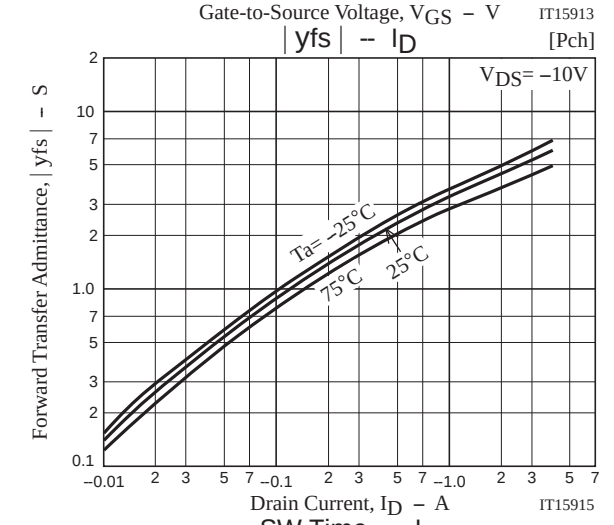

A S O
[Nch]
IDP=12A (PW≤10μs)
ID=3A
100μs
1ms
10ms
100ms
DC operation (Ta=25°C)
Operation in this area
is limited by RDS(on).
Ta=25°C
Single pulse
When mounted on ceramic substrate
(900mm²×0.8mm) 1unit
Drain Current, ID – A
Drain-to-Source Voltage, VDS – V
IT15910

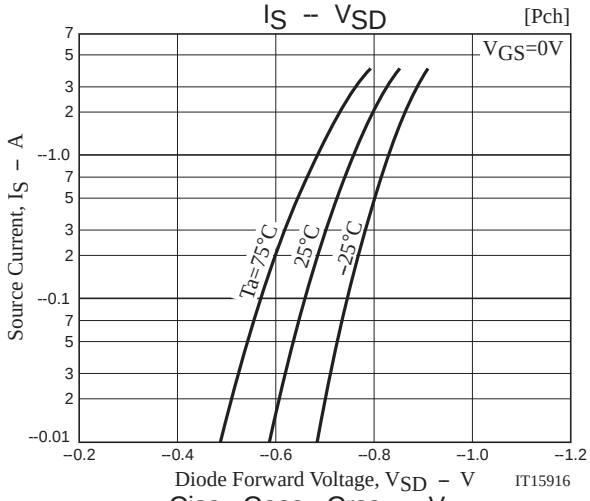

ID -- VDS
[Pch]
–3.0V
–3.5V
–4.0V
–6.0V
–10.0V
–16.0V
–4.5V
VGS= –2.5V
Drain Current, ID – A
Drain-to-Source Voltage, VDS – V
IT15911

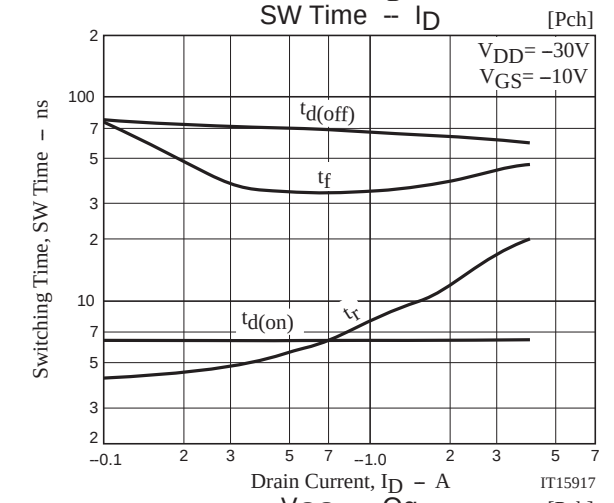

ID -- VGS
[Pch]
VDS= –10V
Ta=75°C
25°C
–25°C
Drain Current, ID – A
Gate-to-Source Voltage, VGS – V
IT15912

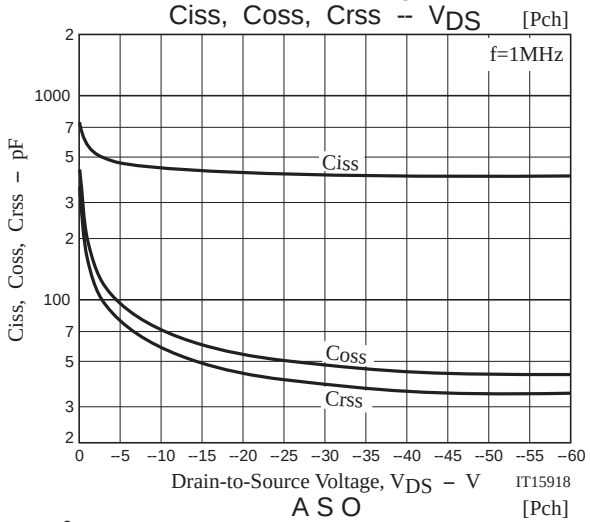

RDS(on) -- VGS
[Pch]
Ta=25°C
ID= –1.5A
–0.75A
Static Drain-to-Source On-State Resistance, RDS(on) – mΩ
Gate-to-Source Voltage, VGS – V
IT15913

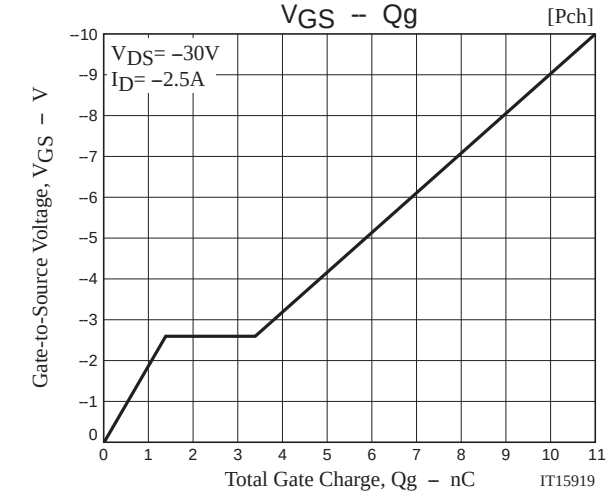

RDS(on) -- Ta
[Pch]
VGS= –4.0V, ID= –0.75A
VGS= –4.5V, ID= –0.75A
VGS= –10.0V, ID= –1.5A
Static Drain-to-Source On-State Resistance, RDS(on) – mΩ
Ambient Temperature, Ta – °C
IT15914

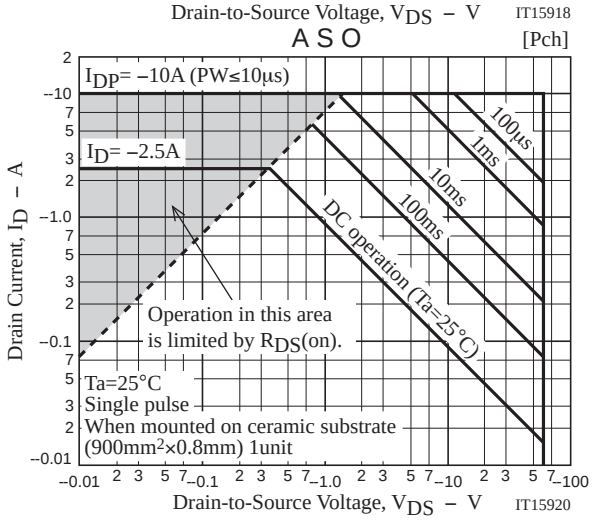

| yfs | -- ID
[Pch]
VDS= –10V
Ta= –25°C
75°C
25°C
Forward Transfer Admittance, | yfs | – S
Drain Current, ID – A
IT15915

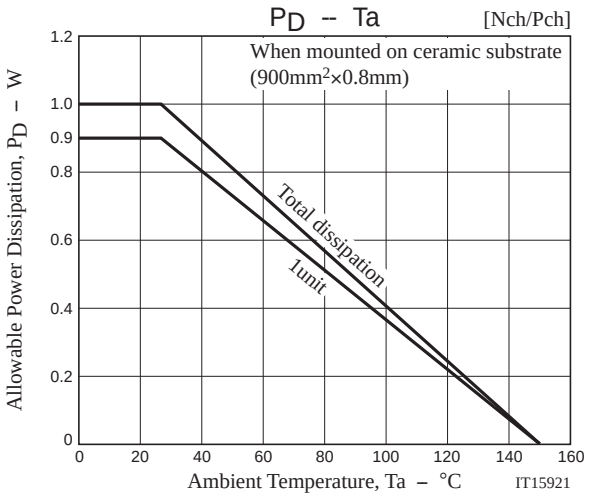

IS -- VSD
[Pch]
VGS=0V
Ta=75°C
25°C
–25°C
Source Current, IS – A
Diode Forward Voltage, VSD – V
IT15916


SW Time -- ID
[Pch]
VDD= –30V
VGS= –10V
td(off)
tf
td(on)
tr
Switching Time, SW Time – ns
Drain Current, ID – A
IT15917


Ciss, Coss, Crss -- VDS
[Pch]
f=1MHz
Ciss
Coss
Crss
Ciss, Coss, Crss – pF
Drain-to-Source Voltage, VDS – V
IT15918


VGS -- Qg
[Pch]
VDS= –30V
ID= –2.5A
Gate-to-Source Voltage, VGS – V
Total Gate Charge, Qg – nC
IT15919


A S O
[Pch]
IDP= –10A (PW≤10μs)
ID= –2.5A
100μs
1ms
10ms
100ms
DC operation (Ta=25°C)
Operation in this area is limited by RDS(on).
Ta=25°C
Single pulse
When mounted on ceramic substrate (900mm²×0.8mm) 1unit
Drain Current, ID – A
Drain-to-Source Voltage, VDS – V
IT15920



Note on usage : Since the VEC2616 is a MOSFET product, please avoid using this device in the vicinity of highly charged objects.

This catalog provides information as of September, 2010. Specifications and information herein are subject to change without notice.