Ordering number : EN9078

SANYO Semiconductors

DATA SHEET

MOSFET : P-Channel Silicon MOSFET
SBD : Schottky Barrier Diode

VEC2801 — General-Purpose Switching Device Applications

Features

- The best suited for DC / DC converter.
- Composite type with a P-Channel Sillicon MOSFET and a Schottky Barrier Diode contained in one package facilitating high-density mounting.

[MOSFET]
- Low ON-resistance.
- 1.8V drive.

[SBD]
- Short reverse recovery time.
- Low forward voltage.

Specifications

Absolute Maximum Ratings at Ta=25°C

Parameter	Symbol	Conditions	Ratings	Unit
[MOSFET]				
Drain-to-Source Voltage	V_{DSS}		−12	V
Gate-to-Source Voltage	V_{GSS}		±8	V
Drain Current (DC)	I_D		−3	A
Drain Current (Pulse)	I_{DP}	PW≤10μs, duty cycle≤1%	−12	A
Allowable Power Dissipation	P_D	Mounted on a ceramic board (900mm²×0.8mm) 1unit	0.9	W
Channel Temperature	Tch		150	°C
Storage Temperature	Tstg		−55 to +125	°C
[SBD]				
Repetitive Peak Reverse Voltage	V_{RRM}		15	V
Nonrepetitive Peak Reverse Surge Voltage	V_{RSM}		15	V
Average Output Current	I_O		1	A
Surge Forward Current	I_{FSM}	50Hz sine wave, 1 cycle	3	A
Junction Temperature	Tj		−55 to +125	°C
Storage Temperature	Tstg		−55 to +125	°C

Marking : BL

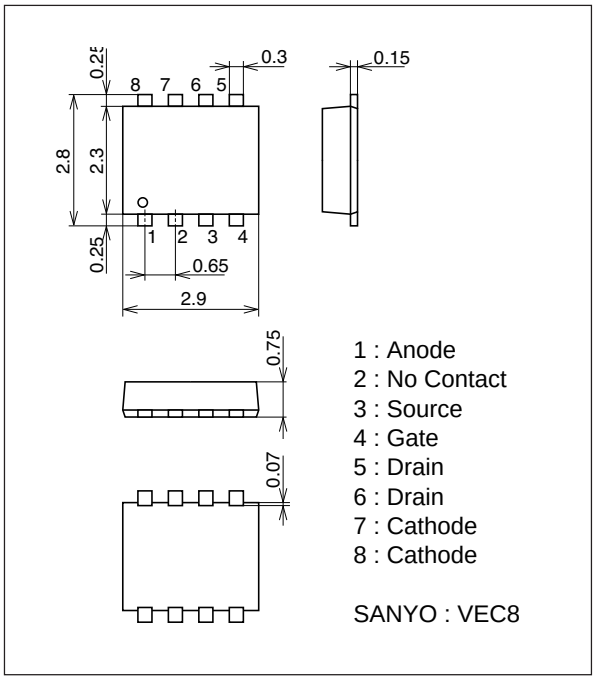
Electrical Characteristics at Ta=25°C

Parameter	Symbol	Conditions	Ratings			Unit
			min	typ	max	
[MOSFET]						
Drain-to-Source Breakdown Voltage	$V_{(BR)DSS}$	I_D= –1mA, V_{GS}=0	–12			V
Zero-Gate Voltage Drain Current	I_{DSS}	V_{DS}= –12V, V_{GS}=0			–1	μA
Gate-to-Source Leakage Current	I_{GSS}	V_{GS}=±6.4V, V_{DS}=0			±10	μA
Cutoff Voltage	V_{GS}(off)	V_{DS}= –6V, I_D= –1mA	–0.3		–1.3	V
Forward Transfer Admittance	|yfs|	V_{DS}= –6V, I_D= –1.5A	4.2	6		S
Static Drain-to-Source On-State Resistance	R_{DS}(on)1	I_D= –3A, V_{GS}= –4.5V		47	62	mΩ
	R_{DS}(on)2	I_D= –1.5A, V_{GS}= –2.5V		64	89	mΩ
	R_{DS}(on)3	I_D= –0.3A, V_{GS}= –1.8V		85	122	mΩ
Input Capacitance	Ciss	V_{DS}= –6V, f=1MHz		940		pF
Output Capacitance	Coss	V_{DS}= –6V, f=1MHz		230		pF
Reverse Transfer Capacitance	Crss	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.		84		ns
Turn-OFF Delay Time	t_d(off)	See specified Test Circuit.		104		ns
Fall Time	t_f	See specified Test Circuit.		106		ns
Total Gate Charge	Qg	V_{DS}= –6V, V_{GS}= –4.5V, I_D= –3A		11		nC
Gate-to-Source Charge	Qgs	V_{DS}= –6V, V_{GS}= –4.5V, I_D= –3A		1.6		nC
Gate-to-Drain “Miller” Charge	Qgd	V_{DS}= –6V, V_{GS}= –4.5V, I_D= –3A		2.8		nC
Diode Forward Voltage	V_{SD}	I_S= –3A, V_{GS}=0		–0.85	–1.2	V
[SBD]						
Reverse Voltage	V_R	I_R=1mA	15			V
Forward Voltage	V_F	I_F=1A		0.35	0.45	V
Reverse Current	I_R	V_R=6V			500	μA
Interterminal Capacitance	C	V_R=10V, f=1MHz		45		pF
Reverse Recovery Time	t_{rr}	I_F=I_R=100mA, See specified Test Circuit.			15	ns
Thermal Resistance	Rth(j-a)	Mounted on a ceramic board (900mm²×0.8mm)		70		°C / W

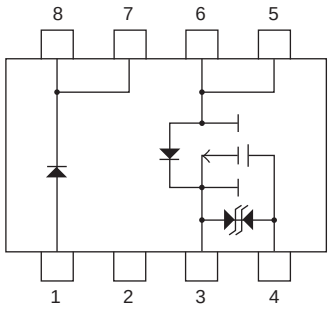
Package Dimensions

unit : mm (typ)

7012-004



Electrical Connection

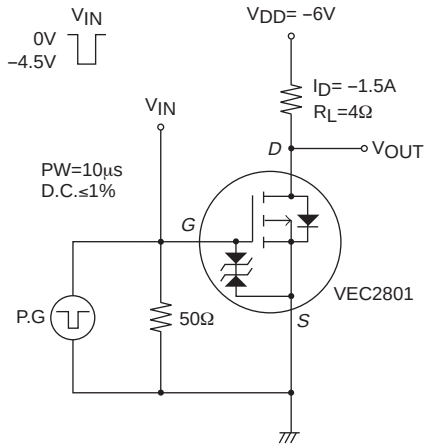


1 : Anode
2 : No Contact
3 : Source
4 : Gate
5 : Drain
6 : Drain
7 : Cathode
8 : Cathode

Top view

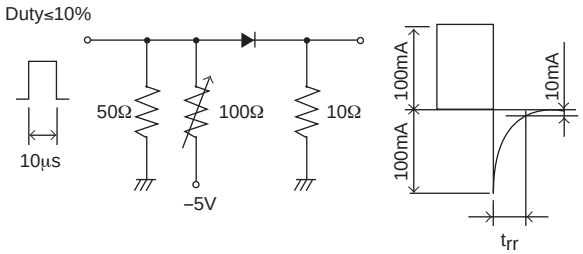
Switching Time Test Circuit

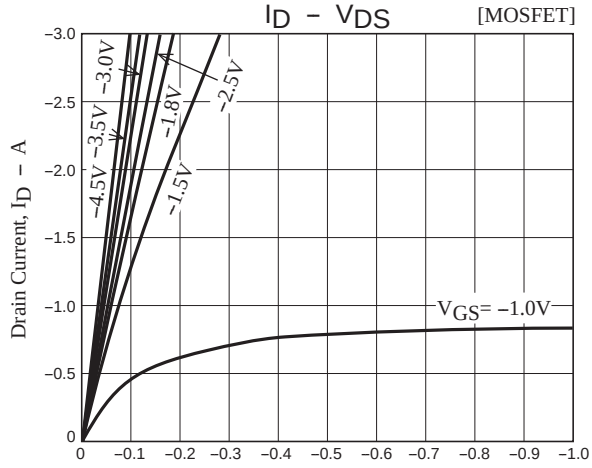
[MOSFET]

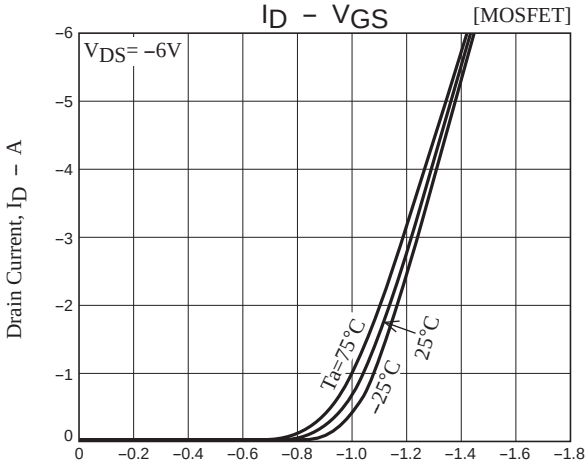


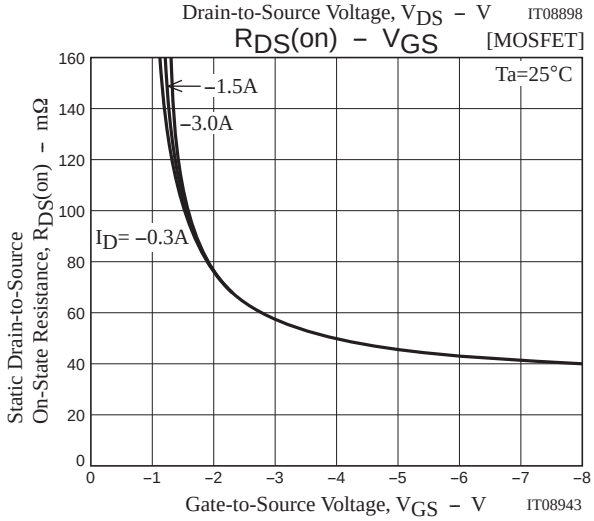
t_{rr} Test Circuit

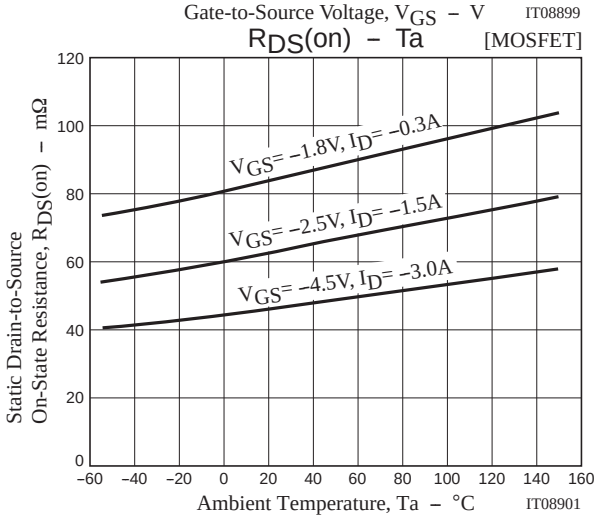
[SBD]

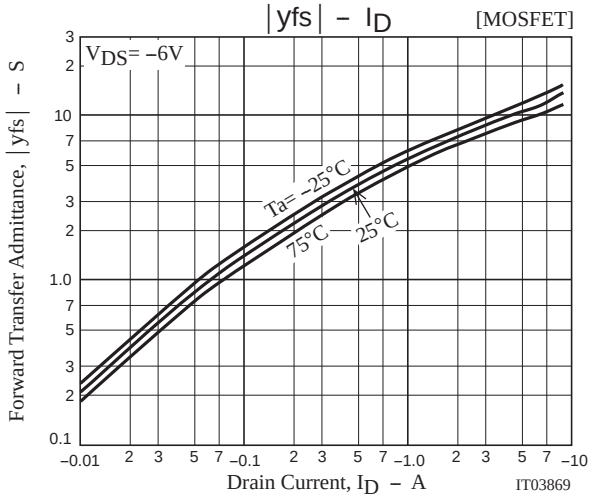


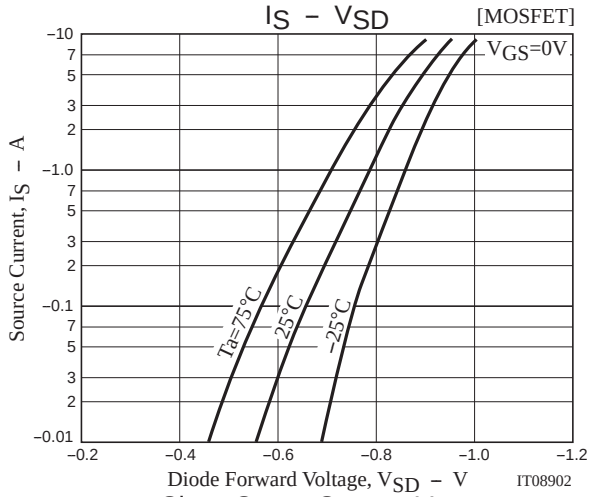


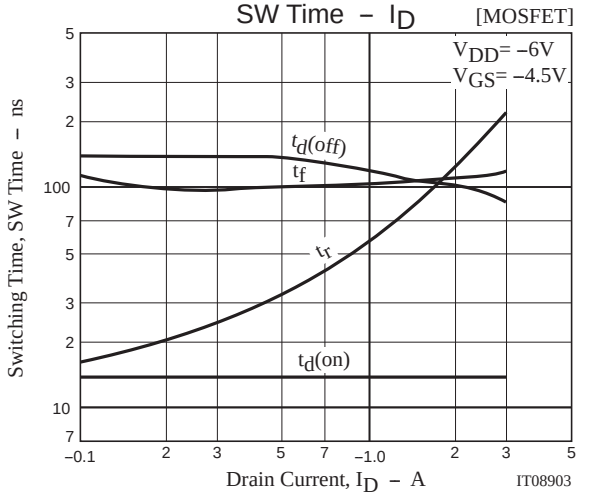


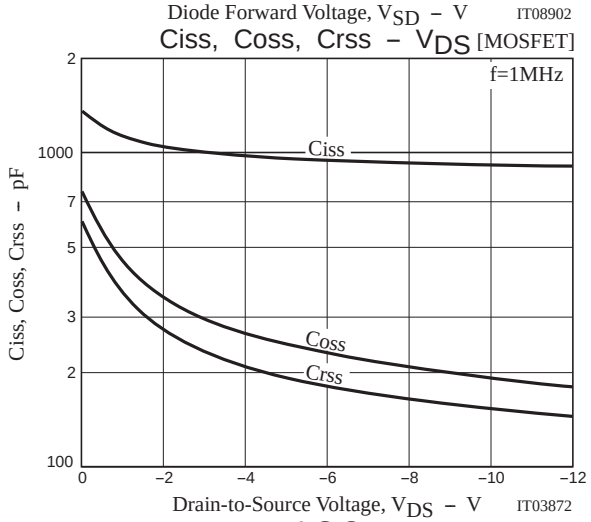


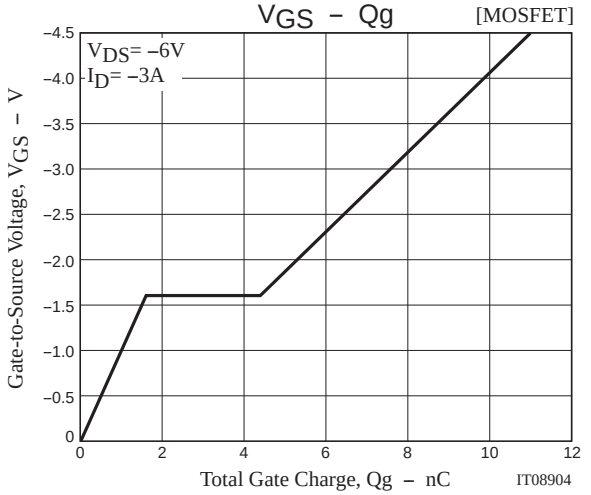


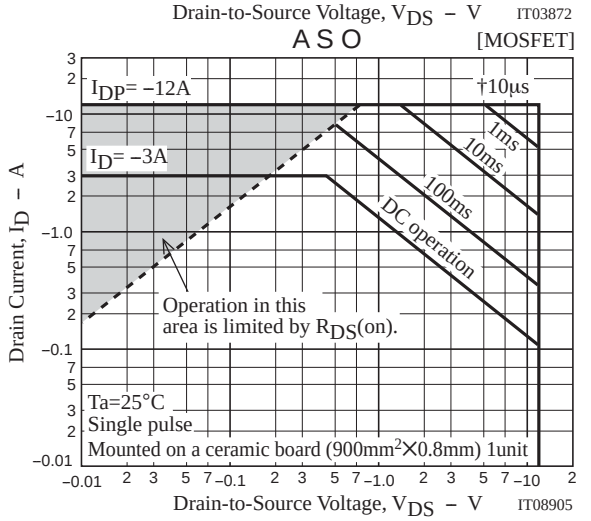

|yfs| – ID [MOSFET]
VDS= –6V
Ta= –25°C
75°C
25°C
Forward Transfer Admittance, |yfs| – S
Drain Current, ID – A
IT03869

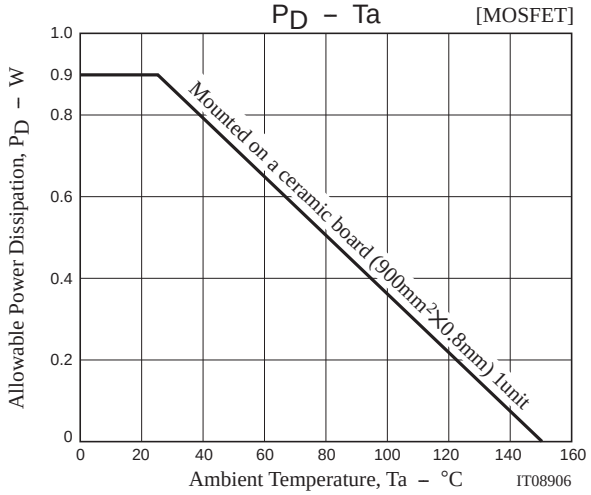

IS – VSD [MOSFET]
VGS=0V
Ta=75°C
25°C
–25°C
Source Current, IS – A
Diode Forward Voltage, VSD – V
IT08902


SW Time – ID [MOSFET]
VDD= –6V
VGS= –4.5V
td(off)
tf
tr
td(on)
Switching Time, SW Time – ns
Drain Current, ID – A
IT08903

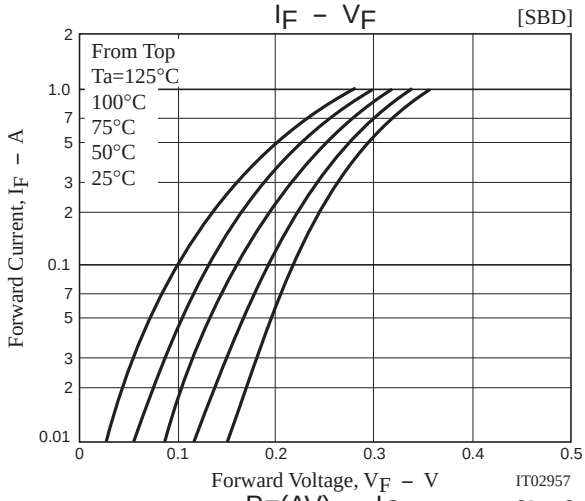

Ciss, Coss, Crss – VDS [MOSFET]
f=1MHz
Ciss
Coss
Crss
Ciss, Coss, Crss – pF
Drain-to-Source Voltage, VDS – V
IT03872


VGS – Qg [MOSFET]
VDS= –6V
ID= –3A
Gate-to-Source Voltage, VGS – V
Total Gate Charge, Qg – nC
IT08904

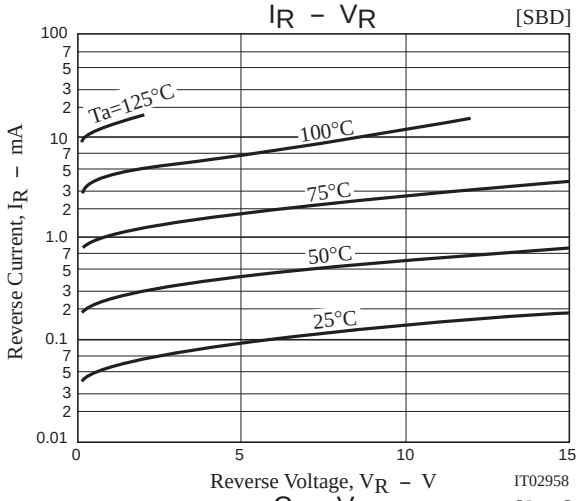

ASO [MOSFET]
IDP= –12A
ID= –3A
†10µs
1ms
10ms
100ms
DC operation
Operation in this
area is limited by RDS(on).
Ta=25°C
Single pulse
Mounted on a ceramic board (900mm2×0.8mm) 1unit
Drain Current, ID – A
Drain-to-Source Voltage, VDS – V
IT08905


PD – Ta [MOSFET]
Mounted on a ceramic board (900mm2×0.8mm) 1unit
Allowable Power Dissipation, PD – W
Ambient Temperature, Ta – °C
IT08906

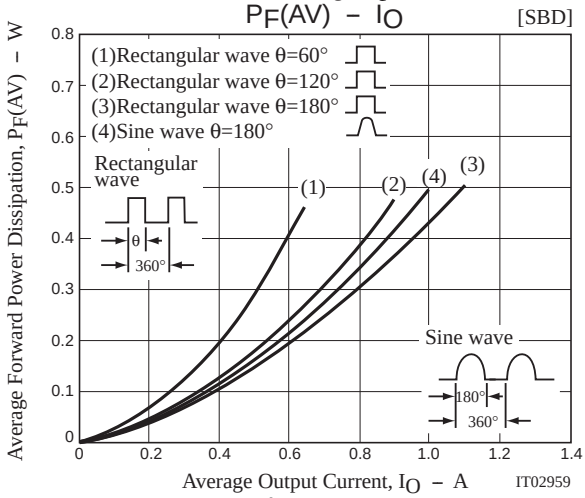
$I_F - V_F$ [SBD]



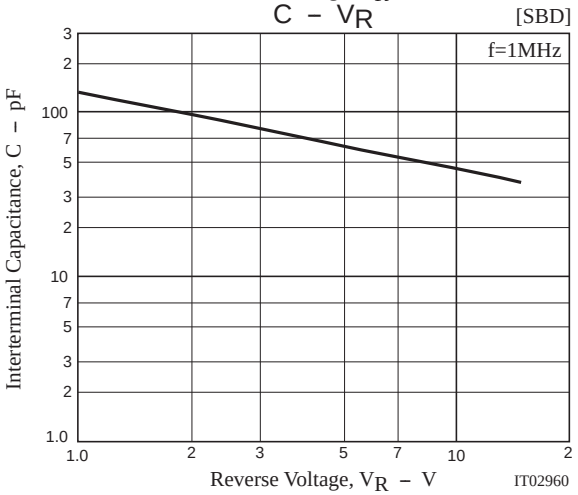
$I_R - V_R$ [SBD]



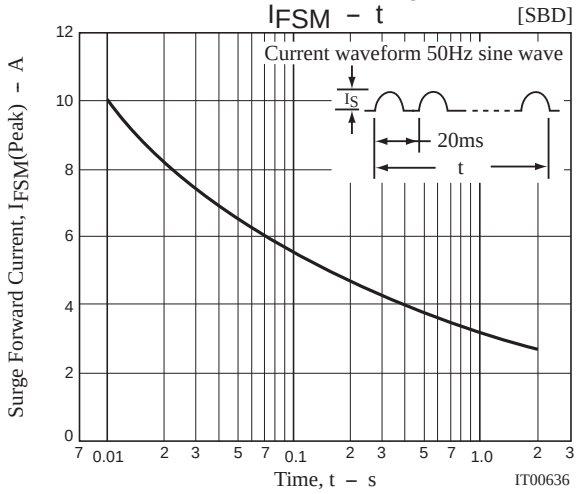
$P_{F(AV)} - I_O$ [SBD]



$C - V_R$ [SBD]



$I_{FSM} - t$ [SBD]



Note on usage : Since the VEC2801 is a MOSFET product, please avoid using this device in the vicinity of highly charged objects.

This catalog provides information as of June, 2009. Specifications and information herein are subject to change without notice.