Ordering number : ENN8202

SANYO Semiconductors
DATA SHEET

VEC2803

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

General-Purpose Switching Device Applications

Features

- 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.
- 4V 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}		–30	V
Gate-to-Source Voltage	V_{GSS}		±20	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}		30	V
Nonrepetitive Peak Reverse Surge Voltage	V_{RSM}		35	V
Average Output Current	I_O		1	A
Surge Forward Current	I_{FSM}	50Hz sine wave, 1 cycle	5	A
Junction Temperature	Tj		–55 to +125	°C
Storage Temperature	Tstg		–55 to +125	°C

Marking : BN

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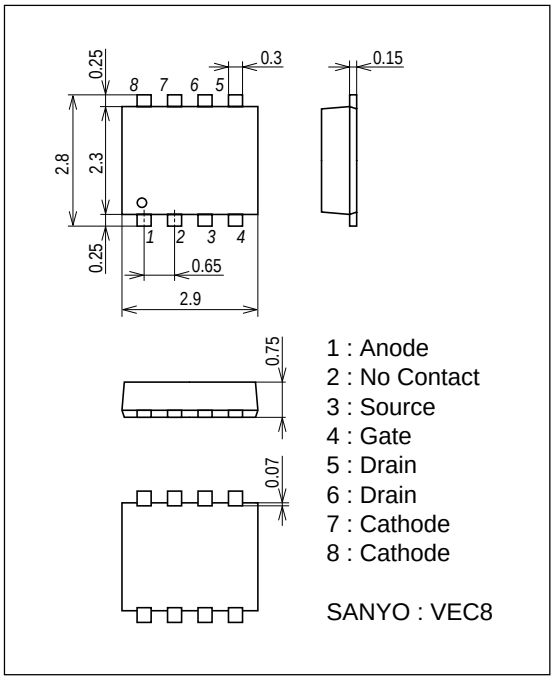
Electrical Characteristics at Ta=25°C

Parameter	Symbol	Conditions	Ratings			Unit
			min	typ	max	
[MOSFET]						
Drain-to-Source Breakdown Voltage	$V_{(BR)DSS}$	I_D=–1mA, V_{GS}=0	–30			V
Zero-Gate Voltage Drain Current	I_{DSS}	V_{DS}=–30V, V_{GS}=0			–1	μA
Gate-to-Source Leakage Current	I_{GSS}	V_{GS}=±16V, V_{DS}=0			±10	μA
Cutoff Voltage	V_{GS}(off)	V_{DS}=–10V, I_D=–1mA	–1.0		–2.4	V
Forward Transfer Admittance	|yfs|	V_{DS}=–10V, I_D=–1.5A	2.0	3.4		S
Static Drain-to-Source On-State Resistance	R_{DS}(on)1	I_D=–1.5A, V_{GS}=–10V		65	86	mΩ
	R_{DS}(on)2	I_D=–0.7A, V_{GS}=–4V		117	168	mΩ
Input Capacitance	Ciss	V_{DS}=–10V, f=1MHz		510		pF
Output Capacitance	Coss	V_{DS}=–10V, f=1MHz		115		pF
Reverse Transfer Capacitance	Crss	V_{DS}=–10V, f=1MHz		78		pF
Turn-ON Delay Time	t_d(on)	See specified Test Circuit.		11		ns
Rise Time	t_r	See specified Test Circuit.		17		ns
Turn-OFF Delay Time	t_d(off)	See specified Test Circuit.		53		ns
Fall Time	t_f	See specified Test Circuit.		35		ns
Total Gate Charge	Qg	V_{DS}=–10V, V_{GS}=–10V, I_D=–3A		11		nC
Gate-to-Source Charge	Qgs	V_{DS}=–10V, V_{GS}=–10V, I_D=–3A		2.4		nC
Gate-to-Drain “Miller” Charge	Qgd	V_{DS}=–10V, V_{GS}=–10V, I_D=–3A		1.7		nC
Diode Forward Voltage	V_{SD}	I_S=–3A, V_{GS}=0		–0.87	–1.2	V
[SBD]						
Reverse Voltage	V_R	I_R=0.5mA	30			V
Forward Voltage	V_F1	I_F=0.5A		0.35	0.39	V
	V_F2	I_F=1A		0.4	0.45	V
Reverse Current	I_R	V_R=15V			360	μA
Interterminal Capacitance	C	V_R=10V, f=1MHz		27		pF
Reverse Recovery Time	t_{rr}	I_F=I_R=100mA, See specified Test Circuit.			10	ns

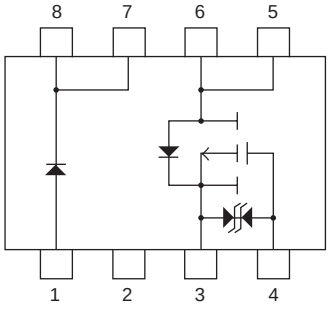
Package Dimensions

unit : mm

2241



Electrical Connection

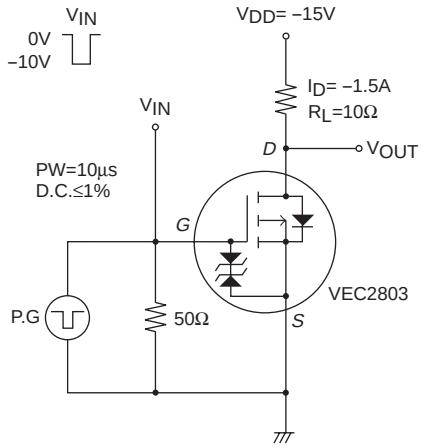


1 : Anode
2 : No Contact
3 : Source
4 : Gate
5 : Drain
6 : Drain
7 : Cathode
8 : Cathode

Top view

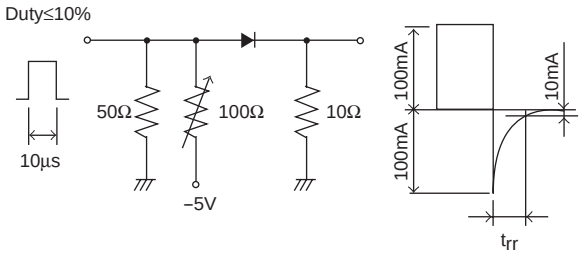
Switching Time Test Circuit

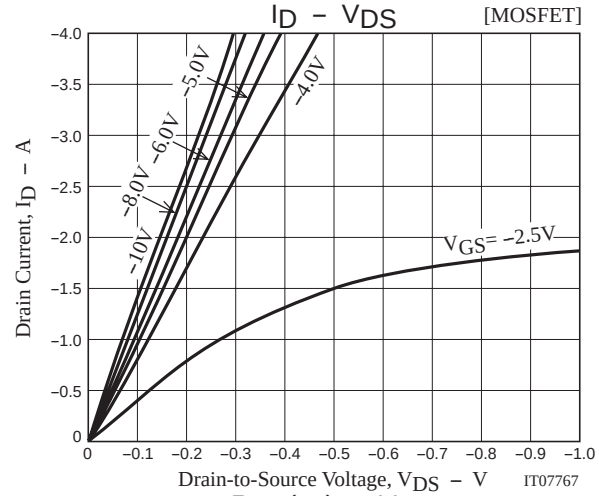
[MOSFET]

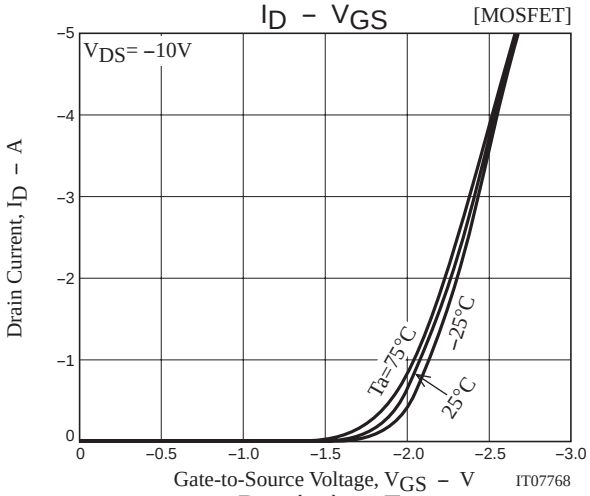


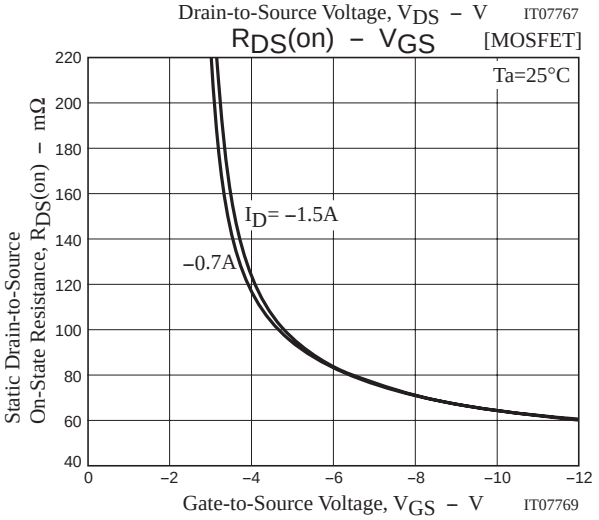
t_{rr} Test Circuit

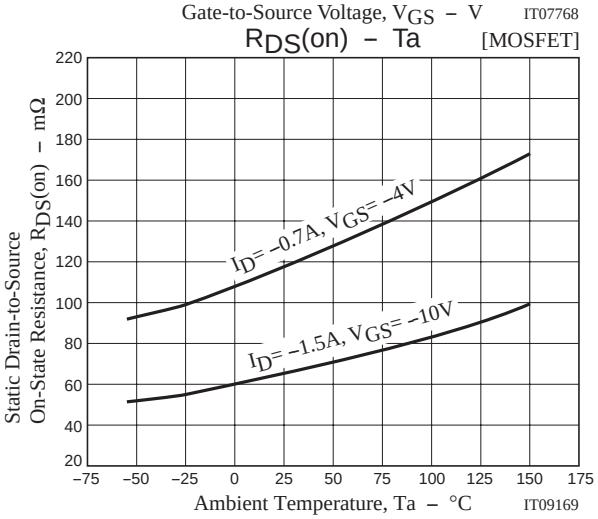
[SBD]

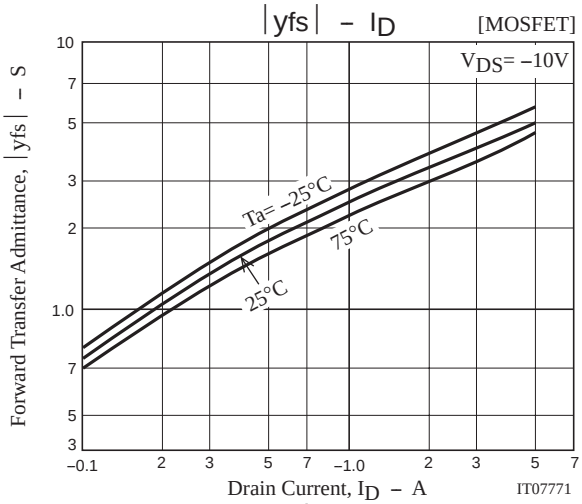


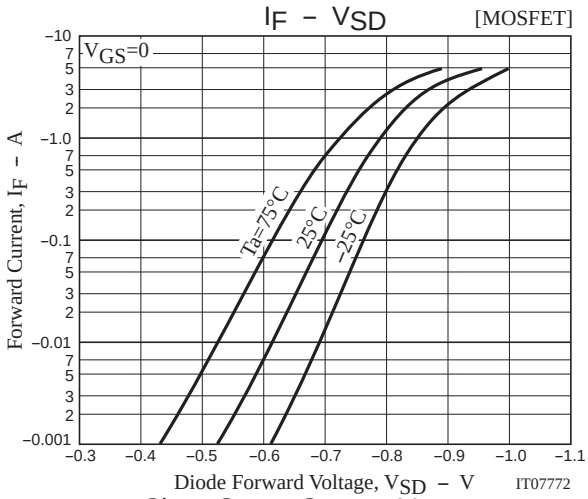


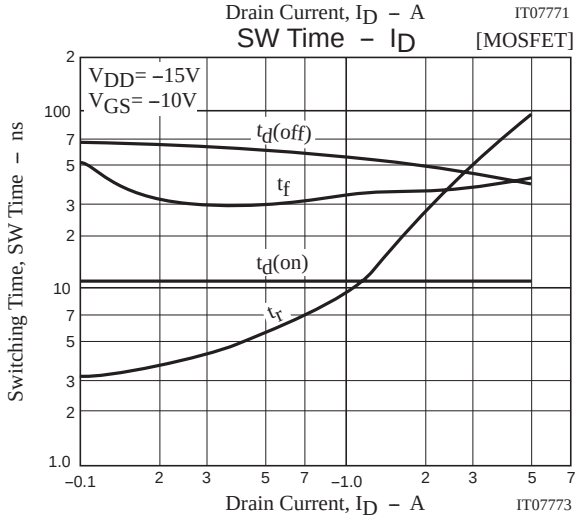


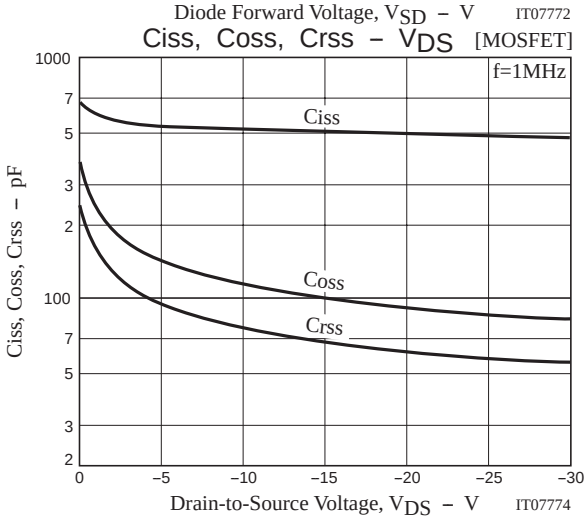


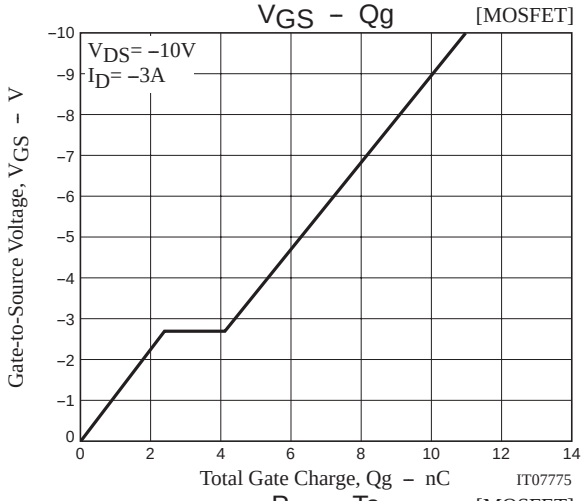


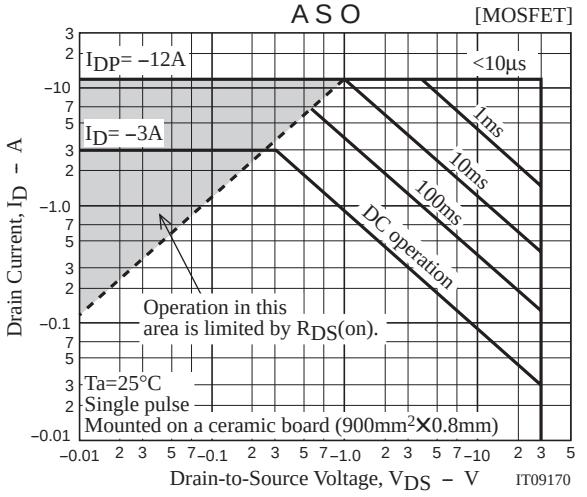

|yfs| – ID [MOSFET]
VDS= –10V
Ta= –25°C
75°C
25°C
Forward Transfer Admittance, |yfs| – S
Drain Current, ID – A
IT07771

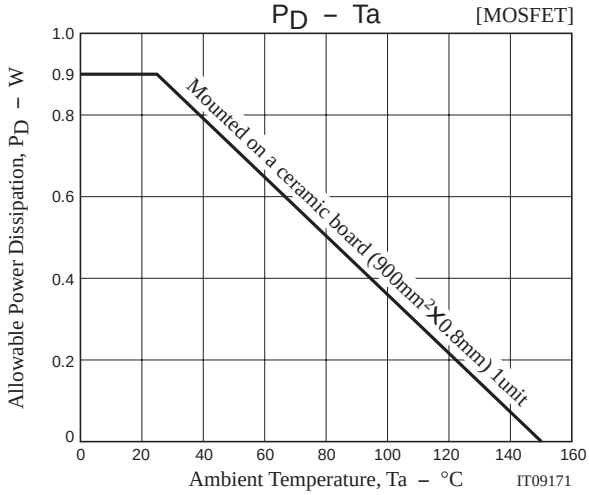

IF – VSD [MOSFET]
VGS=0
Ta=75°C
25°C
–25°C
Forward Current, IF – A
Diode Forward Voltage, VSD – V
IT07772

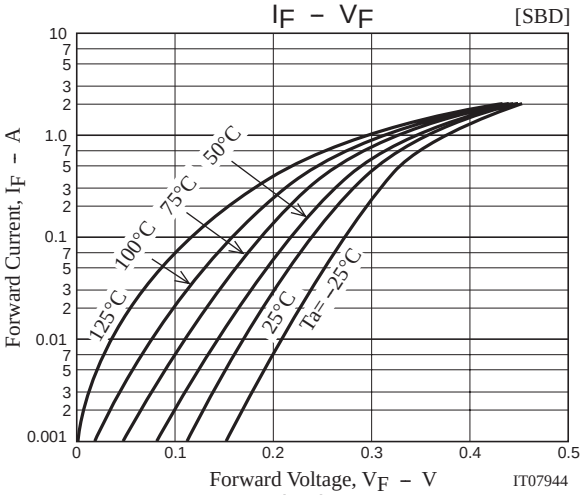

SW Time – ID [MOSFET]
VDD= –15V
VGS= –10V
td(off)
tf
td(on)
tr
Switching Time, SW Time – ns
Drain Current, ID – A
IT07773

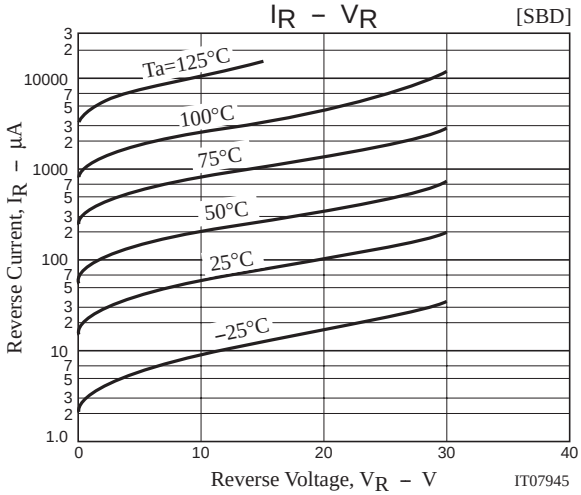

Ciss, Coss, Crss – VDS [MOSFET]
f=1MHz
Ciss
Coss
Crss
Ciss, Coss, Crss – pF
Drain-to-Source Voltage, VDS – V
IT07774

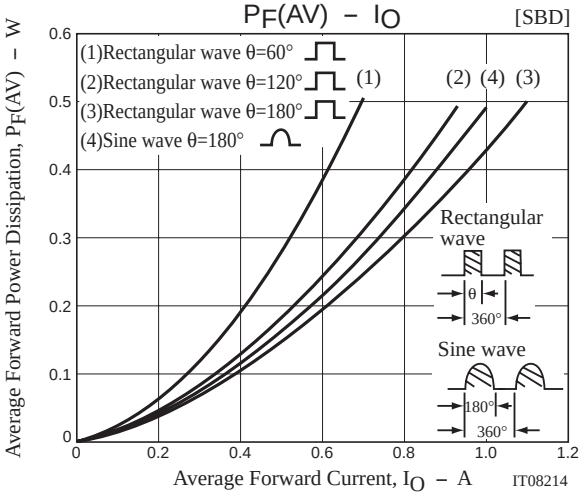

VGS – Qg [MOSFET]
VDS= –10V
ID= –3A
Gate-to-Source Voltage, VGS – V
Total Gate Charge, Qg – nC
IT07775

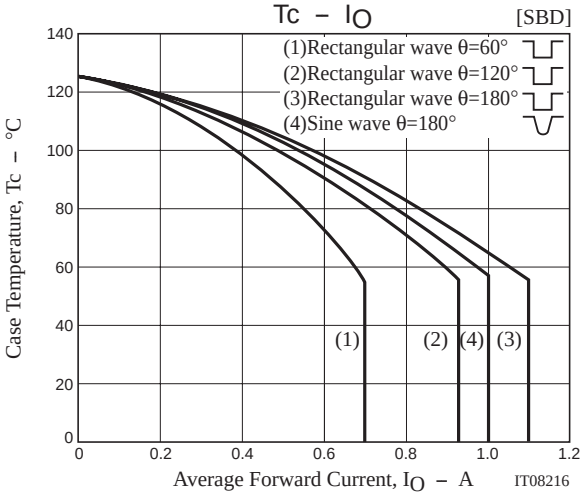

ASO [MOSFET]
IDP= –12A
<10μs
ID= –3A
1ms
10ms
100ms
DC operation
Operation in this
area is limited by RDS(on).
Ta=25°C
Single pulse
Mounted on a ceramic board (900mm2×0.8mm)
Drain Current, ID – A
Drain-to-Source Voltage, VDS – V
IT09170

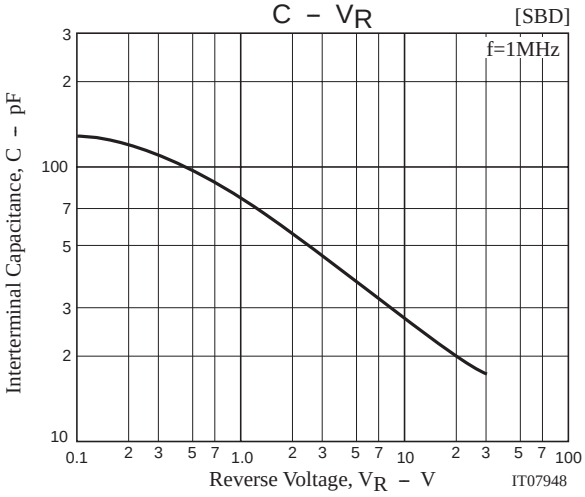

PD – Ta [MOSFET]
Mounted on a ceramic board (900mm2×0.8mm) 1unit
Allowable Power Dissipation, PD – W
Ambient Temperature, Ta – °C
IT09171


IF – VF [SBD]
Forward Current, IF – A
Forward Voltage, VF – V
IT07944
125°C
100°C
75°C
50°C
25°C
Ta= –25°C


IR – VR [SBD]
Reverse Current, IR – μA
Reverse Voltage, VR – V
IT07945
Ta=125°C
100°C
75°C
50°C
25°C
–25°C


PF(AV) – IO [SBD]
Average Forward Power Dissipation, PF(AV) – W
Average Forward Current, IO – A
IT08214
(1)Rectangular wave θ=60°
(2)Rectangular wave θ=120°
(3)Rectangular wave θ=180°
(4)Sine wave θ=180°
(1)
(2) (4) (3)
Rectangular wave
θ
360°
Sine wave
180°
360°


Tc – IO [SBD]
Case Temperature, Tc – °C
Average Forward Current, IO – A
IT08216
(1)Rectangular wave θ=60°
(2)Rectangular wave θ=120°
(3)Rectangular wave θ=180°
(4)Sine wave θ=180°
(1)
(2) (4) (3)


C – VR [SBD]
Interterminal Capacitance, C – pF
Reverse Voltage, VR – V
IT07948
f=1MHz

Note on usage : Since the VEC2803 is a MOSFET product, please avoid using this device in the vicinity of highly charged objects.