Ordering number : ENN7409

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

CPH5819

DC / DC Converter Applications

Features

- Composite type with an N-Channel Sillicon MOSFET (MCH3408) and a Schottky Barrier Diode (SBS006M) contained in one package facilitating high-density mounting.

[MOSFET]

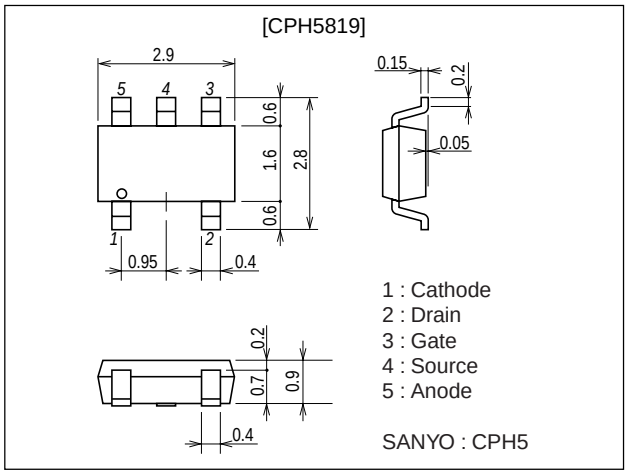
- Low ON-resistance.
- Ultrahigh-speed switching.
- 4V drive.

[SBD]

- Short reverse recovery time.
- Low forward voltage.

Package Dimensions

unit : mm
2171



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		1.4	A
Drain Current (Pulse)	I_{DP}	PW≤10μs, duty cycle≤1%	5.6	A
Allowable Power Dissipation	P_D	Mounted on a ceramic board (600mm²×0.8mm) 1unit	0.8	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}		30	V
Average Output Current	I_O		0.5	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

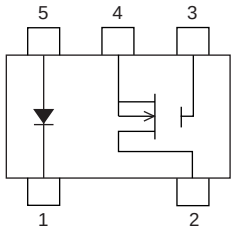
Marking : QV

SANYO Electric Co.,Ltd. Semiconductor Company
TOKYO OFFICE Tokyo Bldg., 1-10, 1 Chome, Ueno, Taito-ku, TOKYO, 110-8534 JAPAN

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	1.2		2.6	V
Forward Transfer Admittance	|yfs|	V_{DS}=10V, I_D=700mA	0.77	1.1		S
Static Drain-to-Source On-State Resistance	R_{DS}(on)1	I_D=700mA, V_{GS}=10V		230	300	mΩ
	R_{DS}(on)2	I_D=400mA, V_{GS}=4V		370	520	mΩ
Input Capacitance	Ciss	V_{DS}=10V, f=1MHz		75		pF
Output Capacitance	Coss	V_{DS}=10V, f=1MHz		20		pF
Reverse Transfer Capacitance	Crss	V_{DS}=10V, f=1MHz		12		pF
Turn-ON Delay Time	t_d(on)	See specified Test Circuit.		6		ns
Rise Time	t_r	See specified Test Circuit.		3		ns
Turn-OFF Delay Time	t_d(off)	See specified Test Circuit.		10		ns
Fall Time	t_f	See specified Test Circuit.		4		ns
Total Gate Charge	Qg	V_{DS}=10V, V_{GS}=10V, I_D=1.4A		2.6		nC
Gate-to-Source Charge	Qgs	V_{DS}=10V, V_{GS}=10V, I_D=1.4A		0.6		nC
Gate-to-Drain “Miller” Charge	Qgd	V_{DS}=10V, V_{GS}=10V, I_D=1.4A		0.5		nC
Diode Forward Voltage	V_{SD}	I_S=1.4A, V_{GS}=0		0.9	1.2	V
[SBD]						
Reverse Voltage	V_R	I_R=0.5mA	30			V
Forward Voltage	V_F1	I_F=0.3A		0.35	0.40	V
	V_F2	I_F=0.5A		0.42	0.47	V
Reverse Current	I_R	V_R=10V			200	μA
Interterminal Capacitance	C	V_R=10V, f=1MHz Cycle		20		pF
Reverse Recovery Time	t_{rr}	I_F=I_R=100mA			10	ns

Electrical Connection

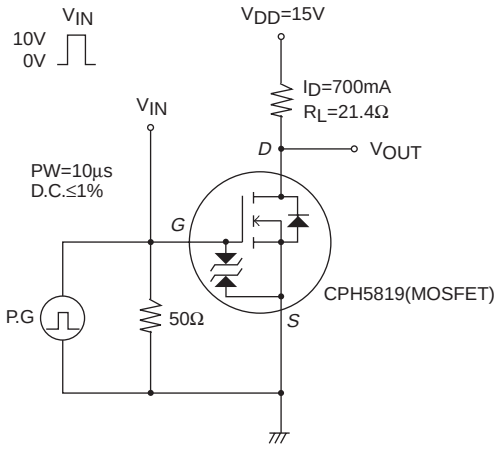


1 : Cathode
2 : Drain
3 : Gate
4 : Source
5 : Anode

(Top view)

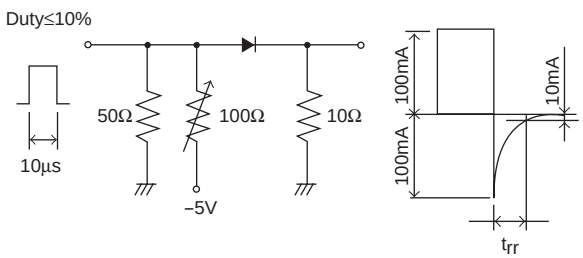
Switching Time Test Circuit

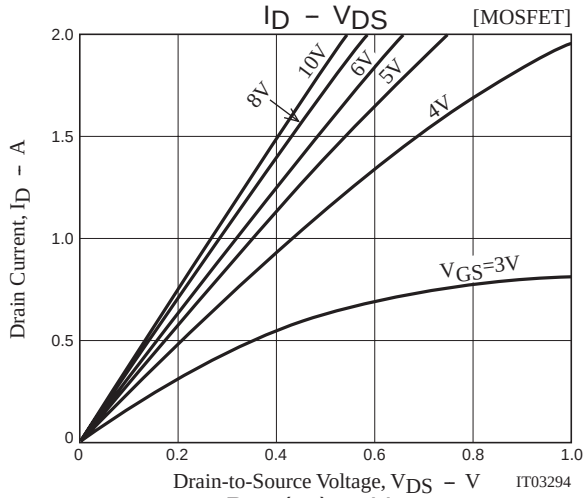
[MOSFET]

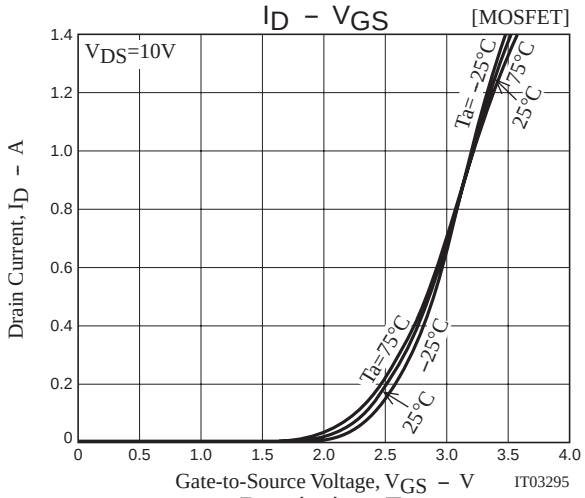


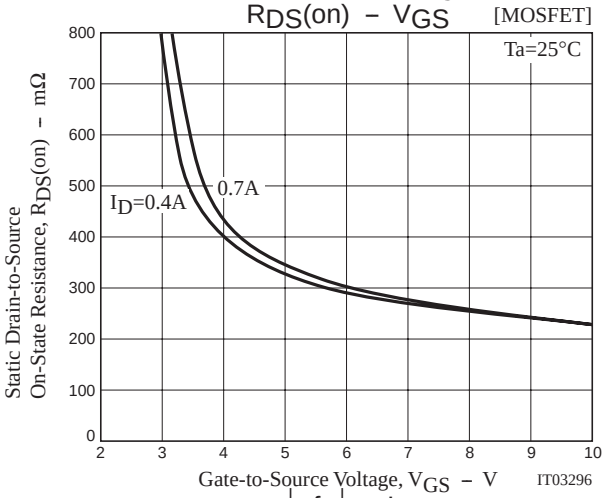
t_{rr} Test Circuit

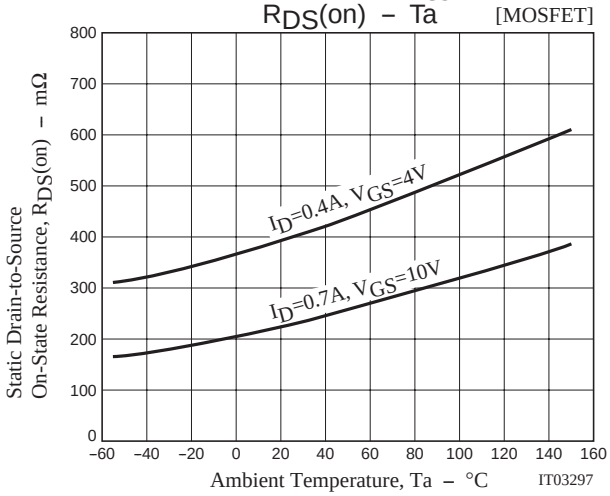
[SBD]

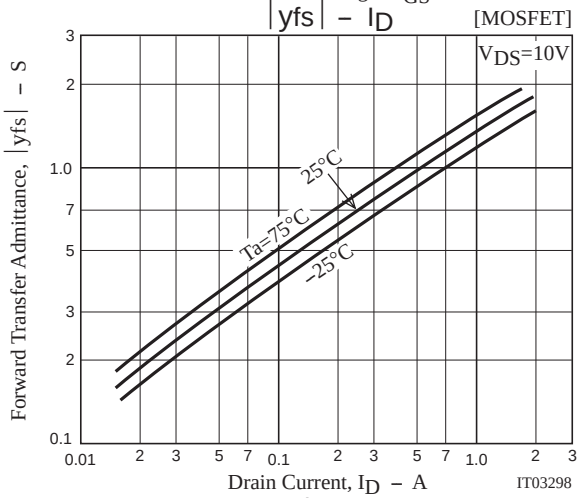


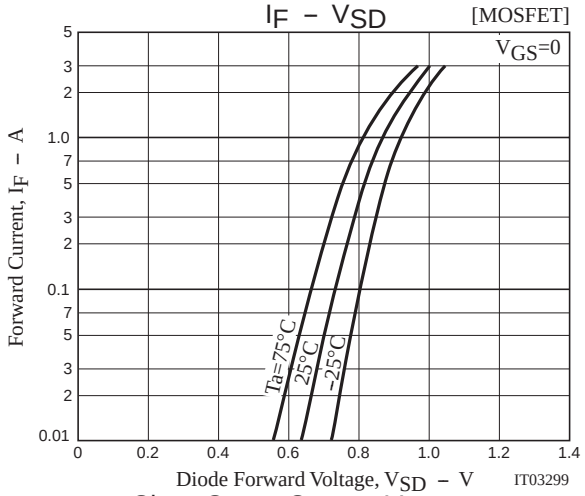

ID – VDS [MOSFET]
Drain Current, ID – A
Drain-to-Source Voltage, VDS – V
IT03294
8V
10V
6V
5V
4V
VGS=3V

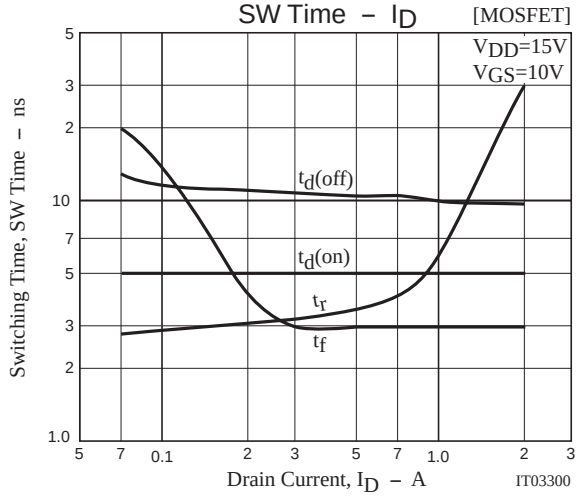

ID – VGS [MOSFET]
VDS=10V
Drain Current, ID – A
Gate-to-Source Voltage, VGS – V
IT03295
Ta=–25°C
75°C
25°C
Ta=75°C
–25°C
25°C

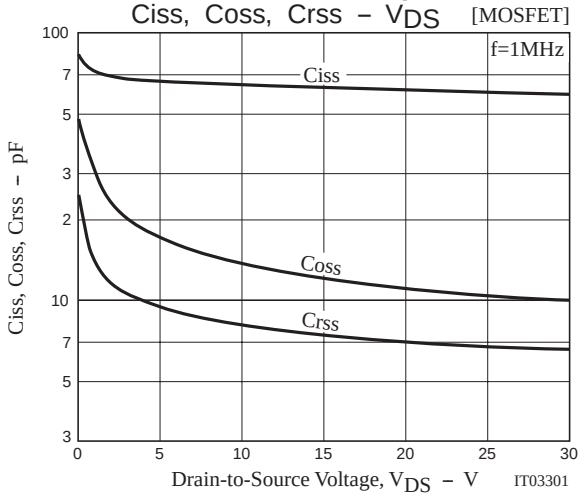

RDS(on) – VGS [MOSFET]
Ta=25°C
Static Drain-to-Source
On-State Resistance, RDS(on) – mΩ
Gate-to-Source Voltage, VGS – V
IT03296
ID=0.4A
0.7A

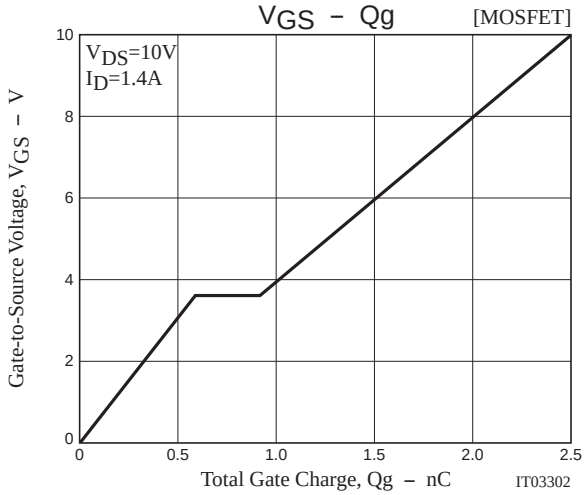

RDS(on) – Ta [MOSFET]
Static Drain-to-Source
On-State Resistance, RDS(on) – mΩ
Ambient Temperature, Ta – °C
IT03297
ID=0.4A, VGS=4V
ID=0.7A, VGS=10V

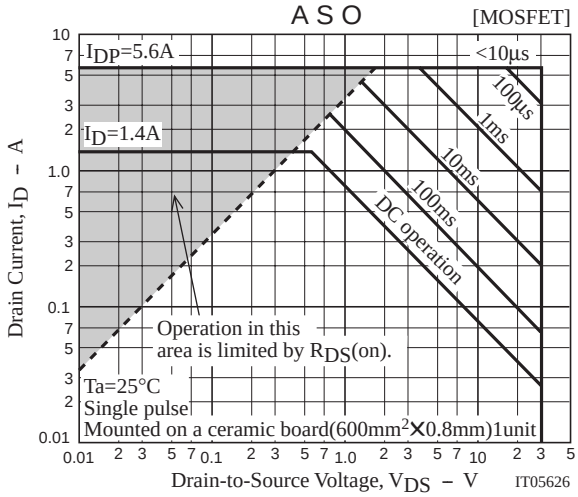

|yfs| – ID [MOSFET]
VDS=10V
Forward Transfer Admittance, |yfs| – S
Drain Current, ID – A
IT03298
25°C
Ta=75°C
–25°C

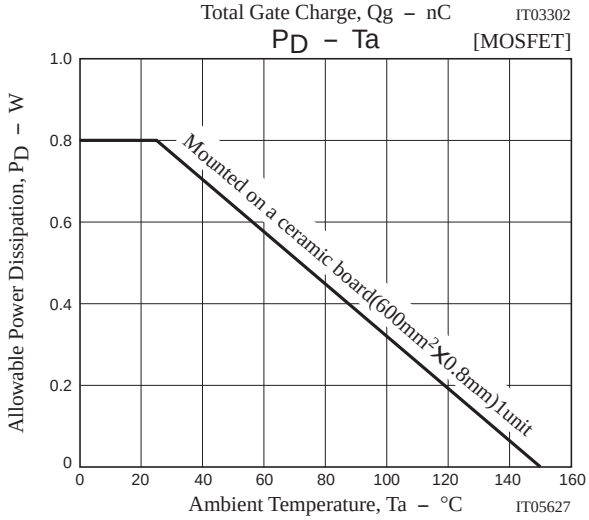

IF – VSD [MOSFET]
VGS=0
Forward Current, IF – A
Diode Forward Voltage, VSD – V
IT03299
Ta=75°C
25°C
–25°C

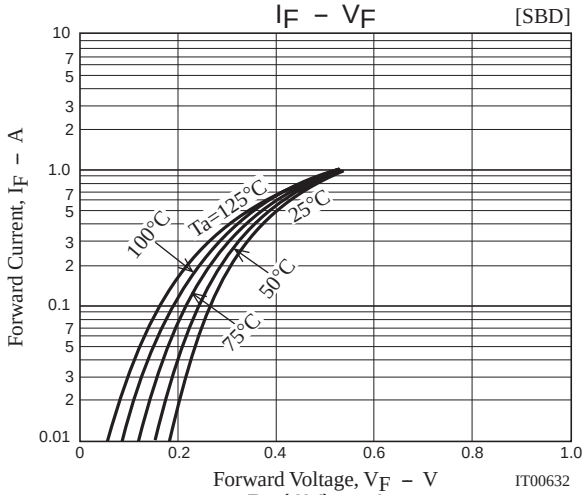

SW Time – ID [MOSFET]
VDD=15V
VGS=10V
Switching Time, SW Time – ns
Drain Current, ID – A
IT03300
td(off)
td(on)
tr
tf

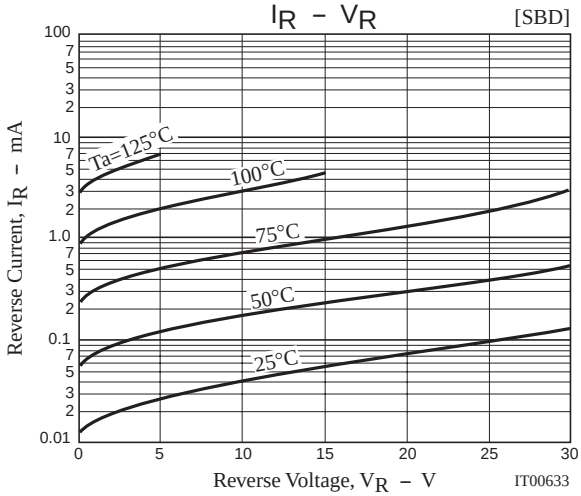

Ciss, Coss, Crss – VDS [MOSFET]
f=1MHz
Ciss, Coss, Crss – pF
Drain-to-Source Voltage, VDS – V
IT03301
Ciss
Coss
Crss

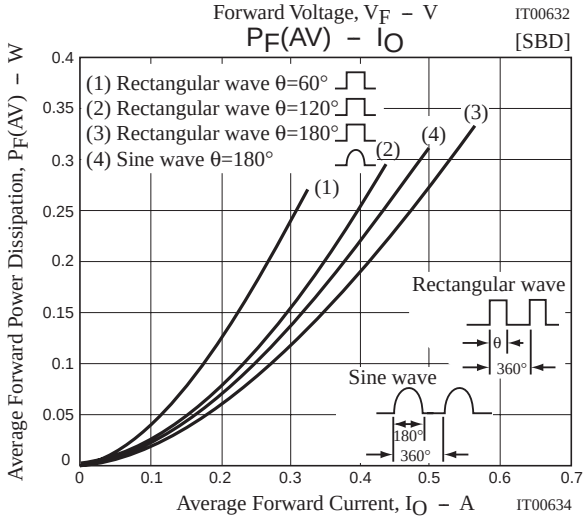

VGS – Qg
[MOSFET]
VDS=10V
ID=1.4A
Gate-to-Source Voltage, VGS – V
Total Gate Charge, Qg – nC
IT03302

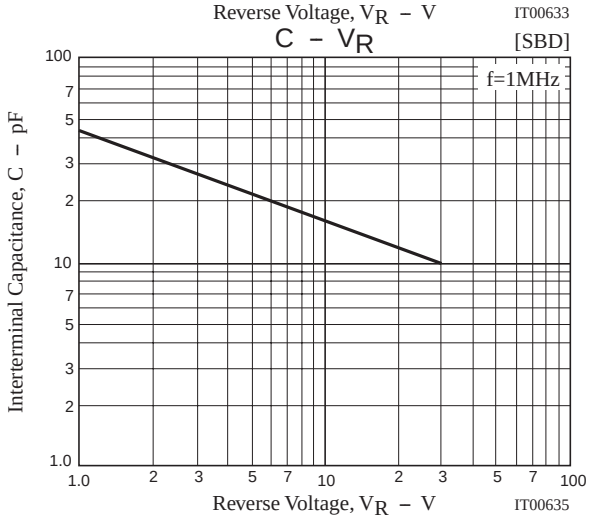

A S O
[MOSFET]
IDP=5.6A
<10µs
100µs
1ms
10ms
100ms
DC operation
ID=1.4A
Operation in this
area is limited by RDS(on).
Ta=25°C
Single pulse
Mounted on a ceramic board(600mm2×0.8mm)1unit
Drain Current, ID – A
Drain-to-Source Voltage, VDS – V
IT05626

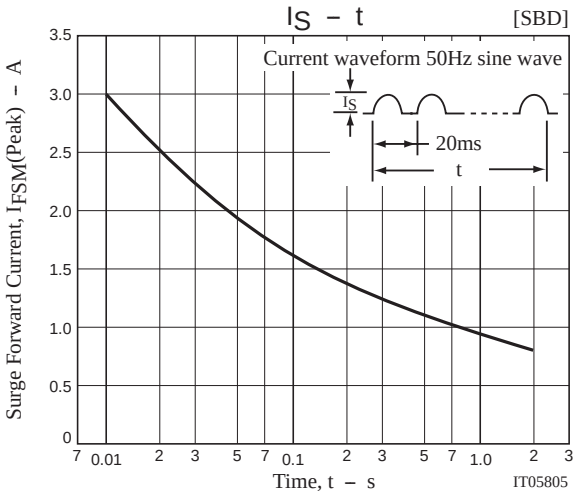

PD – Ta
[MOSFET]
Mounted on a ceramic board(600mm2×0.8mm)1unit
Allowable Power Dissipation, PD – W
Ambient Temperature, Ta – °C
IT05627


IF – VF
[SBD]
Ta=125°C
100°C
75°C
50°C
25°C
Forward Current, IF – A
Forward Voltage, VF – V
IT00632


IR – VR
[SBD]
Ta=125°C
100°C
75°C
50°C
25°C
Reverse Current, IR – mA
Reverse Voltage, VR – V
IT00633


PF(AV) – IO
[SBD]
(1) Rectangular wave θ=60°
(2) Rectangular wave θ=120°
(3) Rectangular wave θ=180°
(4) Sine wave θ=180°
Rectangular wave
Sine wave
θ
360°
180°
Average Forward Power Dissipation, PF(AV) – W
Average Forward Current, IO – A
IT00634


C – VR
[SBD]
f=1MHz
Interterminal Capacitance, C – pF
Reverse Voltage, VR – V
IT00635



- Specifications of any and all SANYO products described or contained herein stipulate the performance, characteristics, and functions of the described products in the independent state, and are not guarantees of the performance, characteristics, and functions of the described products as mounted in the customer's products or equipment. To verify symptoms and states that cannot be evaluated in an independent device, the customer should always evaluate and test devices mounted in the customer's products or equipment.
- SANYO Electric Co., Ltd. strives to supply high-quality high-reliability products. However, any and all semiconductor products fail with some probability. It is possible that these probabilistic failures could give rise to accidents or events that could endanger human lives, that could give rise to smoke or fire, or that could cause damage to other property. When designing equipment, adopt safety measures so that these kinds of accidents or events cannot occur. Such measures include but are not limited to protective circuits and error prevention circuits for safe design, redundant design, and structural design.
- In the event that any or all SANYO products(including technical data,services) described or contained herein are controlled under any of applicable local export control laws and regulations, such products must not be exported without obtaining the export license from the authorities concerned in accordance with the above law.
- No part of this publication may be reproduced or transmitted in any form or by any means, electronic or mechanical, including photocopying and recording, or any information storage or retrieval system, or otherwise, without the prior written permission of SANYO Electric Co., Ltd.
- Any and all information described or contained herein are subject to change without notice due to product/technology improvement, etc. When designing equipment, refer to the "Delivery Specification" for the SANYO product that you intend to use.
- Information (including circuit diagrams and circuit parameters) herein is for example only ; it is not guaranteed for volume production. SANYO believes information herein is accurate and reliable, but no guarantees are made or implied regarding its use or any infringements of intellectual property rights or other rights of third parties.

This catalog provides information as of January, 2003. Specifications and information herein are subject to change without notice.