Ordering number : ENN6961

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

MCH5802

DC / DC Converter Applications

Features

- Composite type with a P-Channel Sillicon MOSFET (MCH3308) and a Schottky Barrier Diode (SBS006M) contained in one package facilitating high-density mounting.

[MOSFET]

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

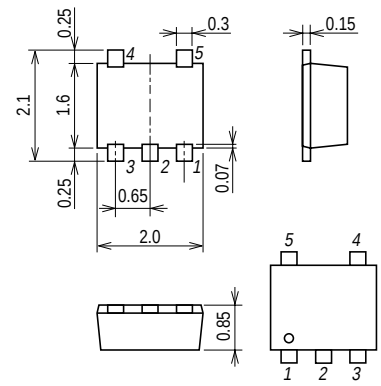
[SBD]

- Short reverse recovery time.
- Low forward voltage.

Package Dimensions

unit : mm
2195

[MCH5802]



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

SANYO : MCPH5

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	A
Drain Current (Pulse)	I_{DP}	PW≤10μs, duty cycle≤1%	−4	A
Allowable Power Dissipation	P_D	Mounted on a ceramic board (900mm²×0.8mm) 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	10	A
Junction Temperature	Tj		−55 to +125	°C
Storage Temperature	Tstg		−55 to +125	°C

Marking : QB

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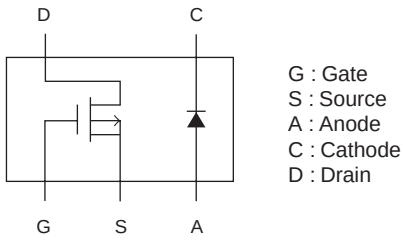
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SANYO Electric Co.,Ltd. Semiconductor Company
TOKYO OFFICE Tokyo Bldg., 1-10, 1 Chome, Ueno, Taito-ku, TOKYO, 110-8534 JAPAN

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=–500mA	570	820		mS
Static Drain-to-Source On-State Resistance	R_{DS}(on)1	I_D=–500mA, V_{GS}=–10V		430	560	mΩ
	R_{DS}(on)2	I_D=–300mA, V_{GS}=–4V		780	1090	mΩ
Input Capacitance	Ciss	V_{DS}=–10V, f=1MHz		80		pF
Output Capacitance	Coss	V_{DS}=–10V, f=1MHz		15		pF
Reverse Transfer Capacitance	Crss	V_{DS}=–10V, f=1MHz		13		pF
Turn-ON Delay Time	t_d(on)	See specified Test Circuit		7		ns
Rise Time	t_r	See specified Test Circuit		20		ns
Turn-OFF Delay Time	t_d(off)	See specified Test Circuit		15		ns
Fall Time	t_f	See specified Test Circuit		7		ns
Total Gate Charge	Qg	V_{DS}=–10V, V_{GS}=–10V, I_D=–1A		2.6		nC
Gate-to-Source Charge	Qgs	V_{DS}=–10V, V_{GS}=–10V, I_D=–1A		0.5		nC
Gate-to-Drain “Miller” Charge	Qgd	V_{DS}=–10V, V_{GS}=–10V, I_D=–1A		0.6		nC
Diode Forward Voltage	V_{SD}	I_S=–1A, V_{GS}=0		–0.9	–1.5	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		20		pF
Reverse Recovery Time	t_{rr}	I_F=I_R=100mA, See specified Test Circuit.			10	ns

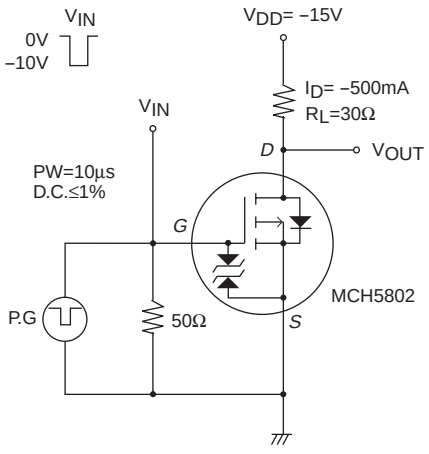
Electrical Connection (Top view)



G : Gate
S : Source
A : Anode
C : Cathode
D : Drain

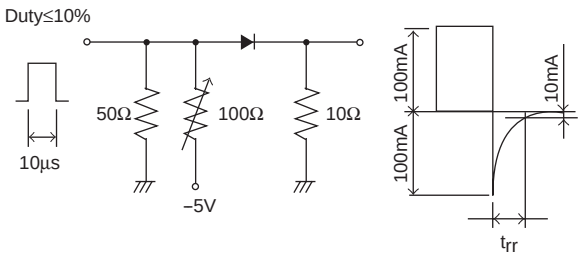
Switching Time Test Circuit

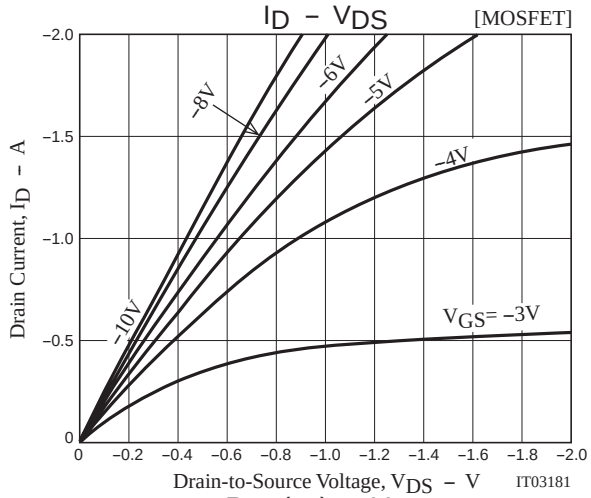
[MOSFET]

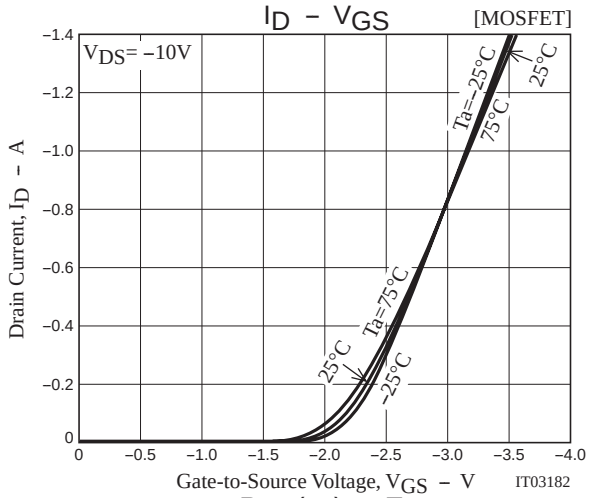


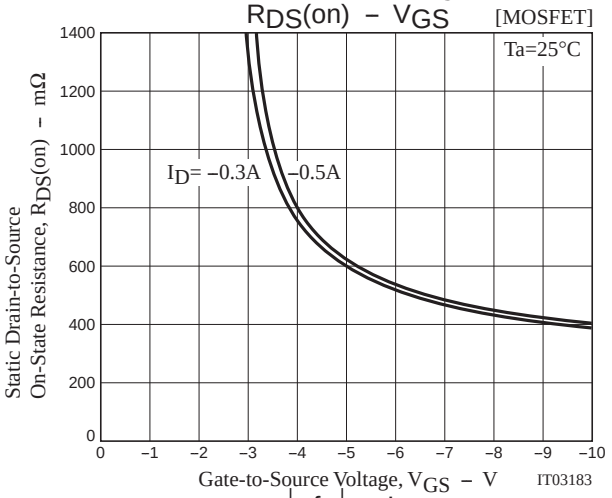
t_{rr} Test Circuit

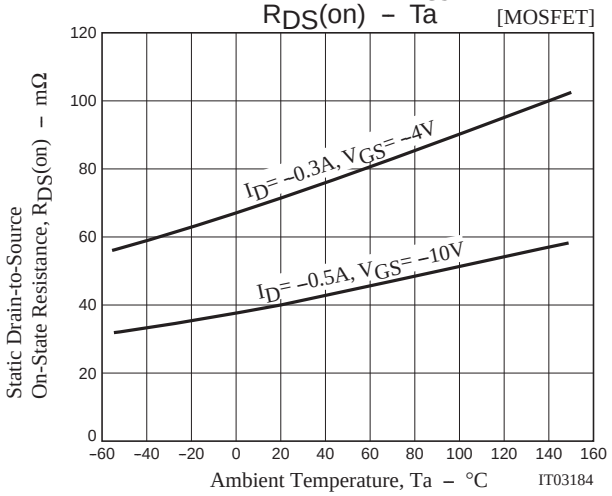
[SBD]

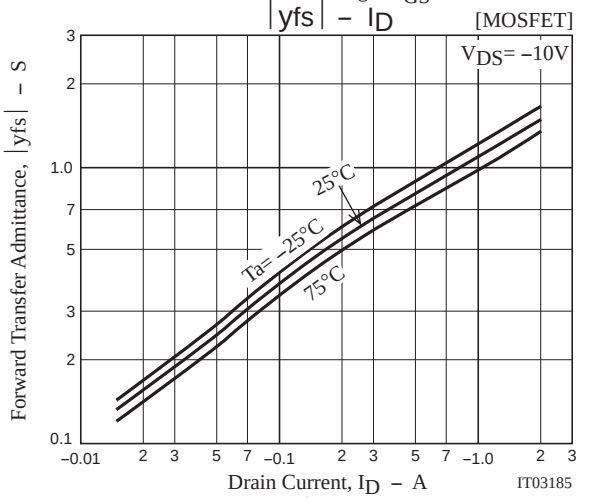


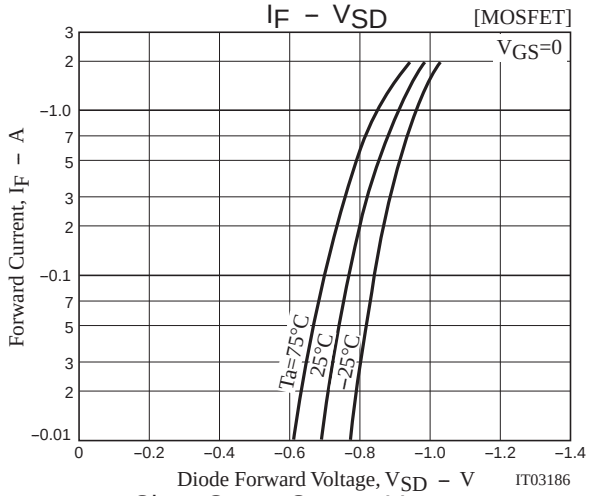

ID – VDS [MOSFET]
Drain Current, ID – A
Drain-to-Source Voltage, VDS – V
IT03181
–8V
–6V
–5V
–4V
–10V
VGS= –3V

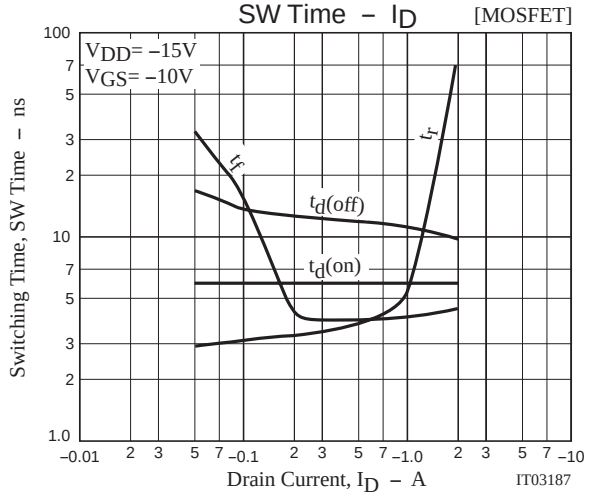

ID – VGS [MOSFET]
Drain Current, ID – A
Gate-to-Source Voltage, VGS – V
IT03182
VDS= –10V
Ta=–25°C
25°C
75°C
25°C
Ta=75°C
–25°C

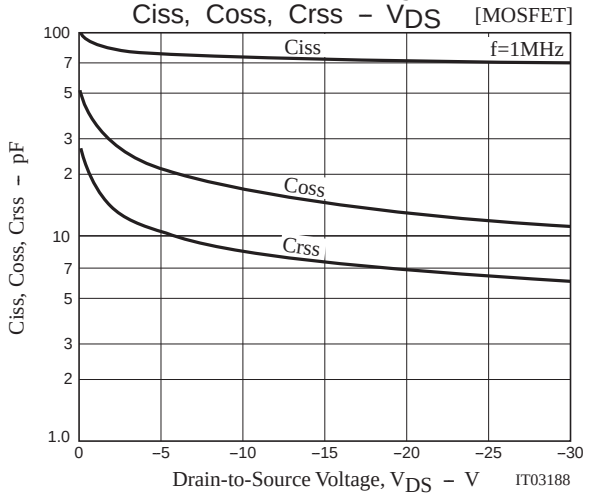

RDS(on) – VGS [MOSFET]
Static Drain-to-Source On-State Resistance, RDS(on) – mΩ
Gate-to-Source Voltage, VGS – V
IT03183
Ta=25°C
ID= –0.3A
–0.5A

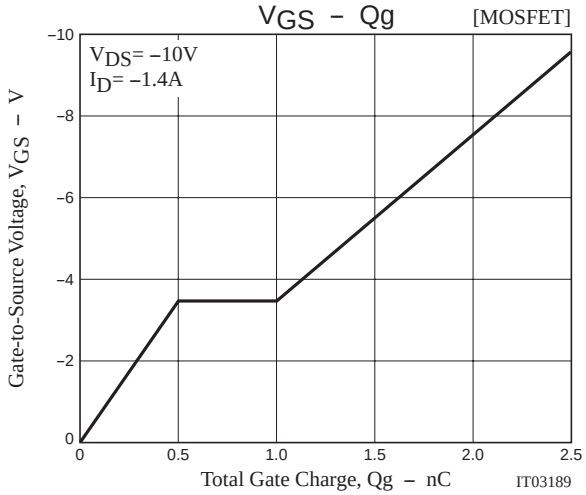

RDS(on) – Ta [MOSFET]
Static Drain-to-Source On-State Resistance, RDS(on) – mΩ
Ambient Temperature, Ta – °C
IT03184
ID= –0.3A, VGS= –4V
ID= –0.5A, VGS= –10V

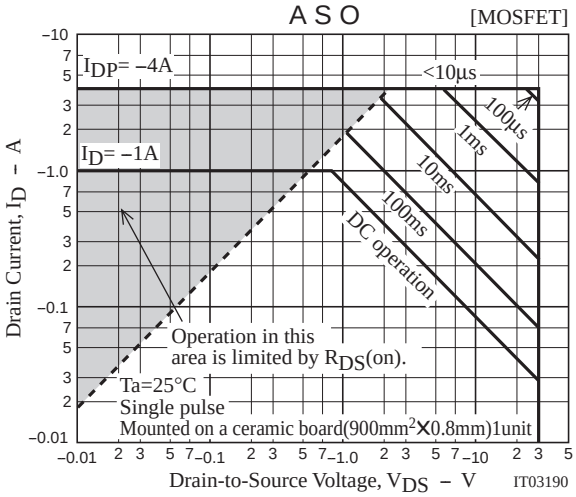

|yfs| – ID [MOSFET]
Forward Transfer Admittance, |yfs| – S
Drain Current, ID – A
IT03185
VDS= –10V
25°C
Ta= –25°C
75°C

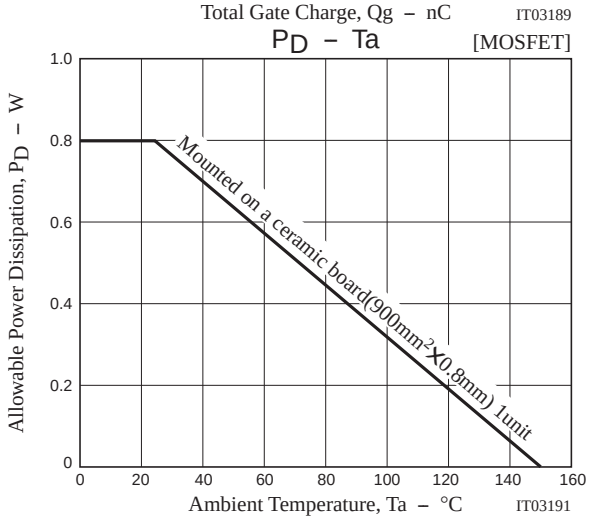

IF – VSD [MOSFET]
Forward Current, IF – A
Diode Forward Voltage, VSD – V
IT03186
VGS=0
Ta=75°C
25°C
–25°C

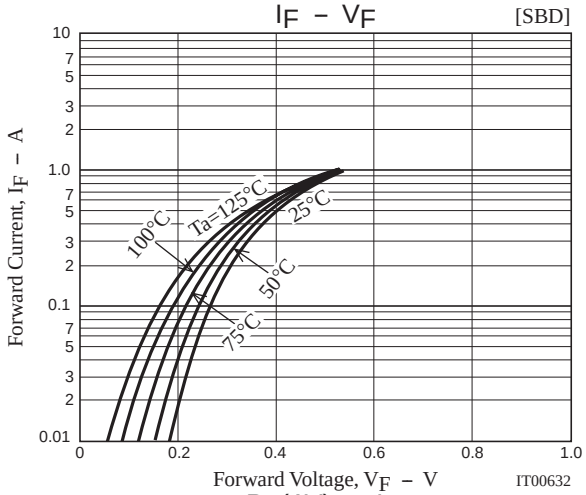

SW Time – ID [MOSFET]
Switching Time, SW Time – ns
Drain Current, ID – A
IT03187
VDD= –15V
VGS= –10V
tf
td(off)
td(on)
tr

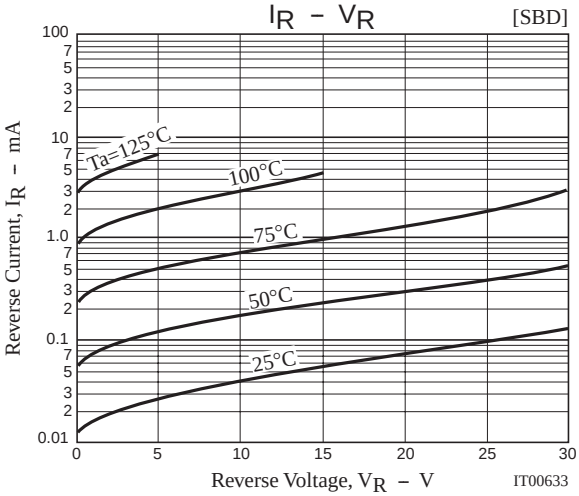

Ciss, Coss, Crss – VDS [MOSFET]
Ciss, Coss, Crss – pF
Drain-to-Source Voltage, VDS – V
IT03188
Ciss
f=1MHz
Coss
Crss

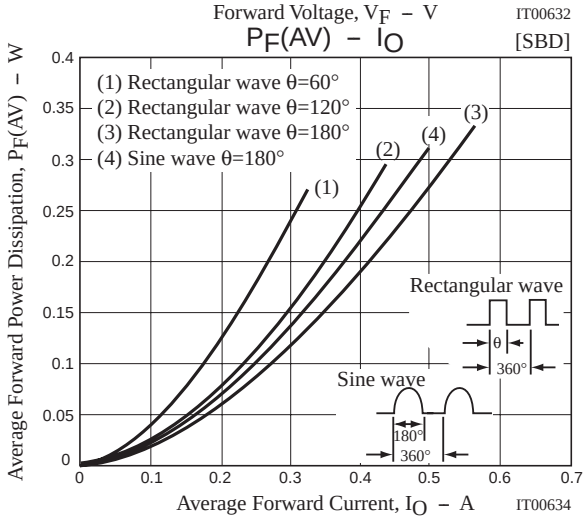

VGS – Qg
[MOSFET]
VDS= –10V
ID= –1.4A
Gate-to-Source Voltage, VGS – V
Total Gate Charge, Qg – nC
IT03189

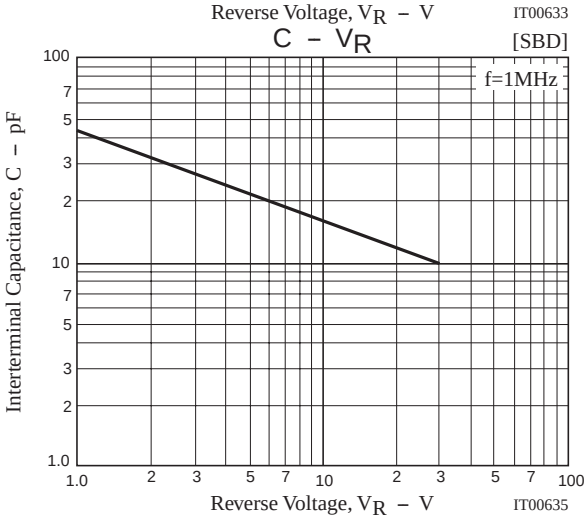

A S O
[MOSFET]
IDP= –4A
ID= –1A
<10µs
100µs
1ms
10ms
100ms
DC operation
Operation in this area is limited by RDS(on).
Ta=25°C
Single pulse
Mounted on a ceramic board(900mm2×0.8mm)1unit
Drain Current, ID – A
Drain-to-Source Voltage, VDS – V
IT03190

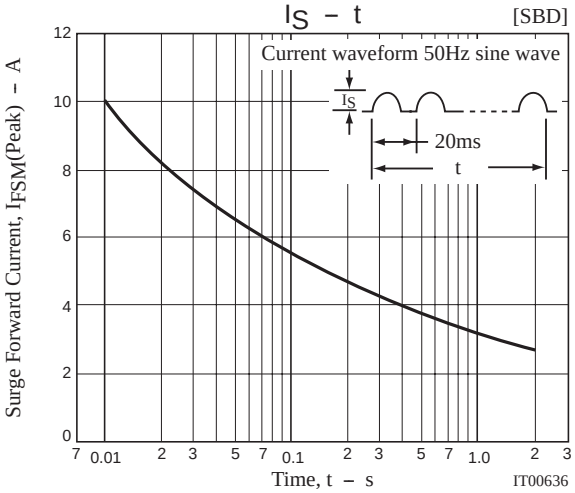

PD – Ta
[MOSFET]
Mounted on a ceramic board(900mm2×0.8mm) 1unit
Allowable Power Dissipation, PD – W
Ambient Temperature, Ta – °C
IT03191


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
θ
360°
Sine wave
180°
360°
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



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