Ordering number : ENN6899

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DATA SHEET

CPH5802

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

DC / DC Converter Applications

Features

- Composite type with a P-Channel Sillicon MOSFET (MCH3306) and a Schottky Barrier Diode (SBS004) contained in one package facilitating high-density mounting.

[MOSFET]

- Low ON-resistance.
- Ultrahigh-speed switching.
- Ultralow voltage drive (1.8V drive).

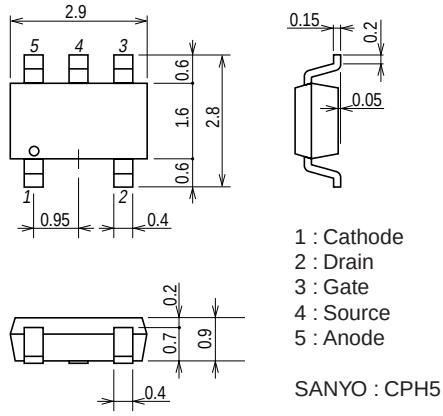
[SBD]

- Short reverse recovery time.
- Low forward voltage.

Package Dimensions

unit : mm
2171

[CPH5802]



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

SANYO : CPH5

Specifications

Absolute Maximum Ratings at Ta=25°C

Parameter	Symbol	Conditions	Ratings	Unit
[MOSFET]				
Drain-to-Source Voltage	V_{DSS}		−20	V
Gate-to-Source Voltage	V_{GSS}		±10	V
Drain Current (DC)	I_D		−2	A
Drain Current (Pulse)	I_{DP}	PW≤10μs, duty cycle≤1%	−8	A
Allowable Power Dissipation	P_D	Mounted on a ceramic board (600mm²×0.8mm) 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	10	A
Junction Temperature	Tj		−55 to +125	°C
Storage Temperature	Tstg		−55 to +125	°C

Marking : QC

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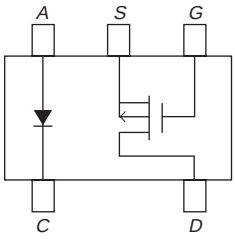
Electrical Characteristics at Ta=25°C

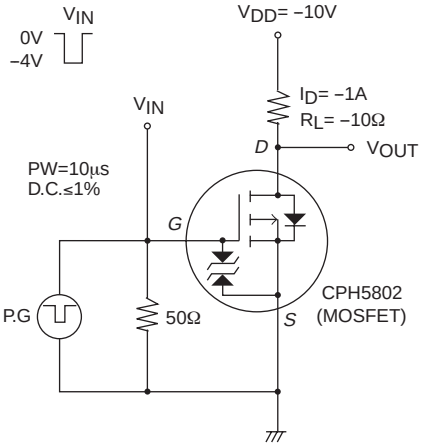
Parameter	Symbol	Conditions	Ratings			Unit
			min	typ	max	
[MOSFET]						
Drain-to-Source Breakdown Voltage	$V_{(BR)DSS}$	I_D=−1mA, V_{GS}=0	−20			V
Zero-Gate Voltage Drain Current	I_{DSS}	V_{DS}=−20V, V_{GS}=0			−10	μA
Gate-to-Source Leakage Current	I_{GSS}	V_{GS}=±8V, V_{DS}=0			±10	μA
Cutoff Voltage	V_{GS}(off)	V_{DS}=−10V, I_D=−1mA	−0.3		−1.0	V
Forward Transfer Admittance	|yfs|	V_{DS}=−10V, I_D=−1A	2.1	3.0		S
Static Drain-to-Source On-State Resistance	R_{DS}(on)1	I_D=−1A, V_{GS}=−4V		110	145	mΩ
	R_{DS}(on)2	I_D=−0.5A, V_{GS}=−2.5V		140	200	mΩ
	R_{DS}(on)3	I_D=−0.1A, V_{GS}=−1.8V		180	260	mΩ
Input Capacitance	Ciss	V_{DS}=−10V, f=1MHz		410		pF
Output Capacitance	Coss	V_{DS}=−10V, f=1MHz		60		pF
Reverse Transfer Capacitance	Crss	V_{DS}=−10V, f=1MHz		40		pF
Turn-ON Delay Time	t_d(on)	See specified Test Circuit		9		ns
Rise Time	t_r	See specified Test Circuit		27		ns
Turn-OFF Delay Time	t_d(off)	See specified Test Circuit		42		ns
Fall Time	t_f	See specified Test Circuit		38		ns
Total Gate Charge	Qg	V_{DS}=−10V, V_{GS}=−10V, I_D=−2A		10		nC
Gate-to-Source Charge	Qgs	V_{DS}=−10V, V_{GS}=−10V, I_D=−2A		0.6		nC
Gate-to-Drain “Miller” Charge	Qgd	V_{DS}=−10V, V_{GS}=−10V, I_D=−2A		1.2		nC
Diode Forward Voltage	V_{SD}	I_S=−2A, V_{GS}=0		−0.88	−1.2	V
[SBD]						
Reverse Voltage	V_R	I_R=1mA	15			V
Forward Voltage	V_F1	I_F=0.5A		0.30	0.35	V
	V_F2	I_F=1A		0.35	0.40	V
Reverse Current	I_R	V_R=6V			500	μA
Interterminal Capacitance	C	V_R=10V, f=1MHz, 1 cycle		42		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 (600mm²×0.8mm)		110		°C / W

Electrical Connection (Top view)



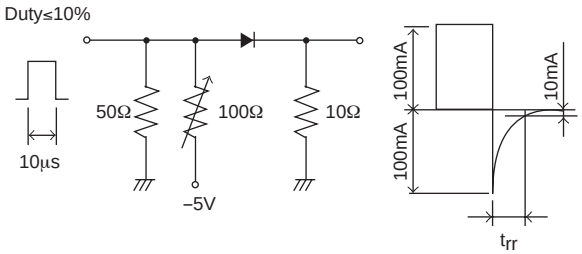
Switching Time Test Circuit

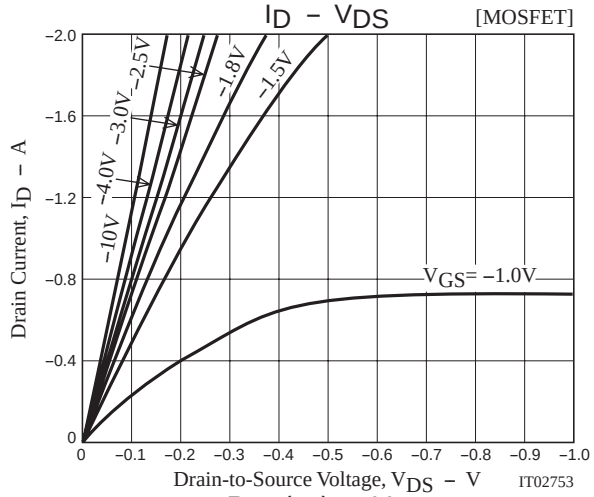
[MOSFET]

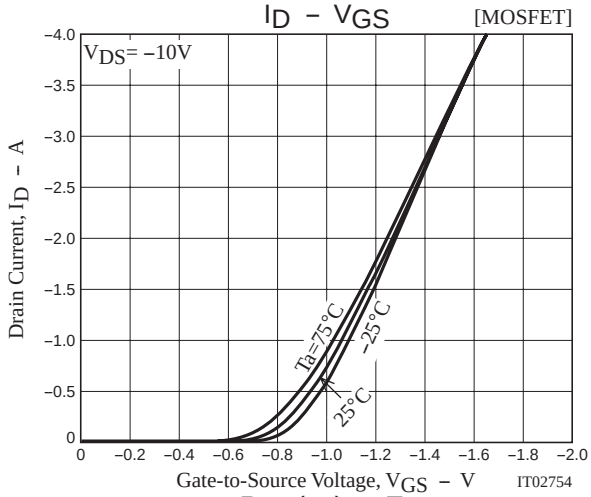


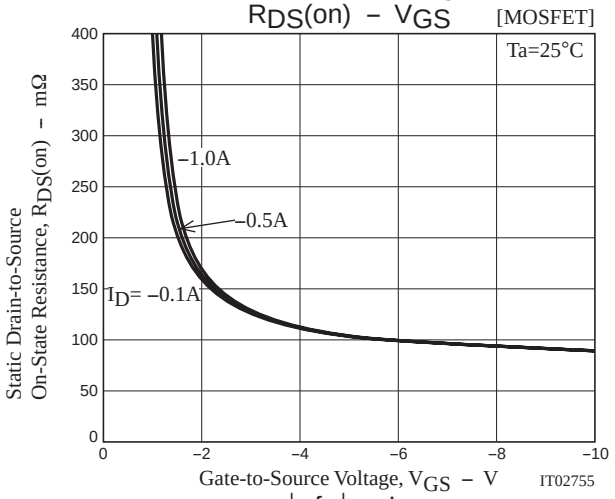
trr Test Circuit

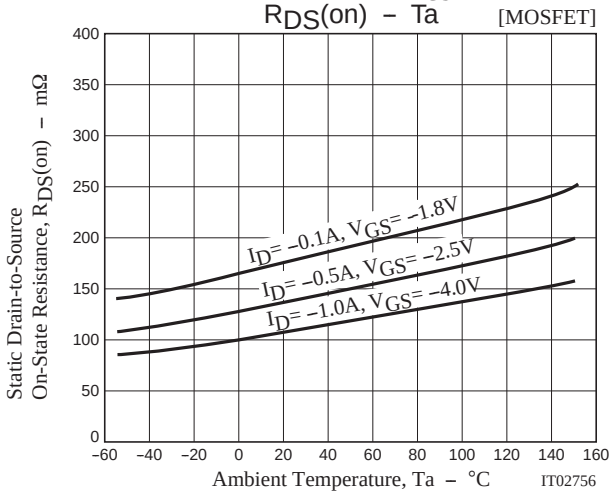
[SBD]

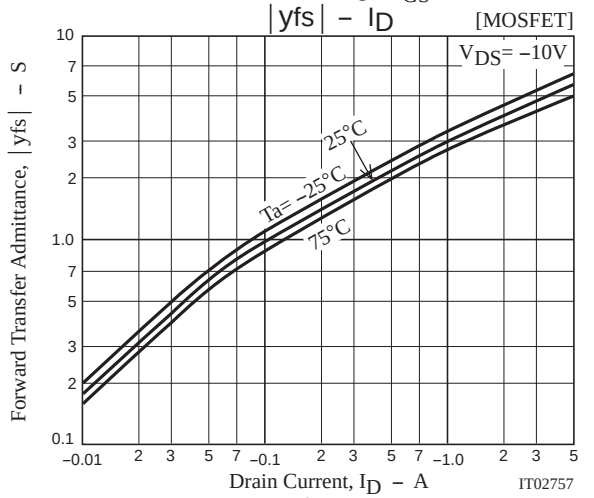


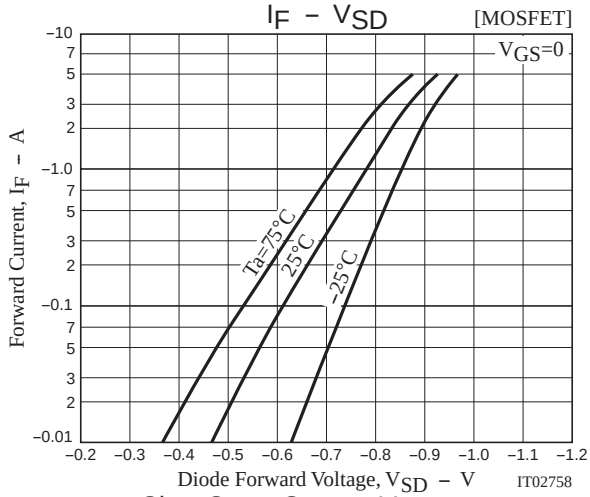

ID – VDS [MOSFET]
Drain Current, ID – A
Drain-to-Source Voltage, VDS – V
IT02753
–10V
–4.0V
–3.0V
–2.5V
–1.8V
–1.5V
VGS= –1.0V

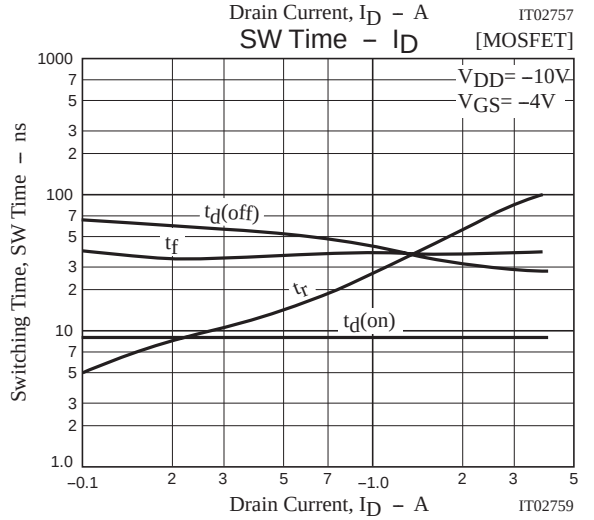

ID – VGS [MOSFET]
Drain Current, ID – A
Gate-to-Source Voltage, VGS – V
IT02754
VDS= –10V
Ta=75°C
25°C
–25°C

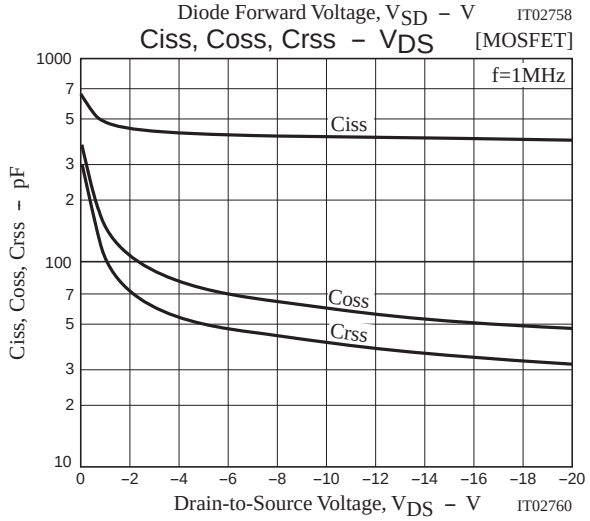

RDS(on) – VGS [MOSFET]
Static Drain-to-Source On-State Resistance, RDS(on) – mΩ
Gate-to-Source Voltage, VGS – V
IT02755
Ta=25°C
–1.0A
–0.5A
ID= –0.1A

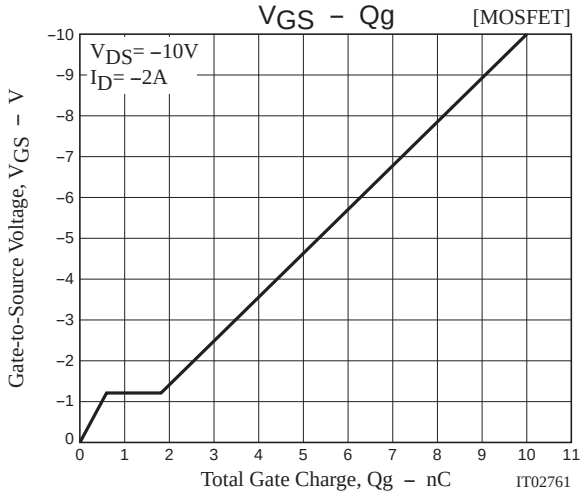

RDS(on) – Ta [MOSFET]
Static Drain-to-Source On-State Resistance, RDS(on) – mΩ
Ambient Temperature, Ta – °C
IT02756
ID= –0.1A, VGS= –1.8V
ID= –0.5A, VGS= –2.5V
ID= –1.0A, VGS= –4.0V

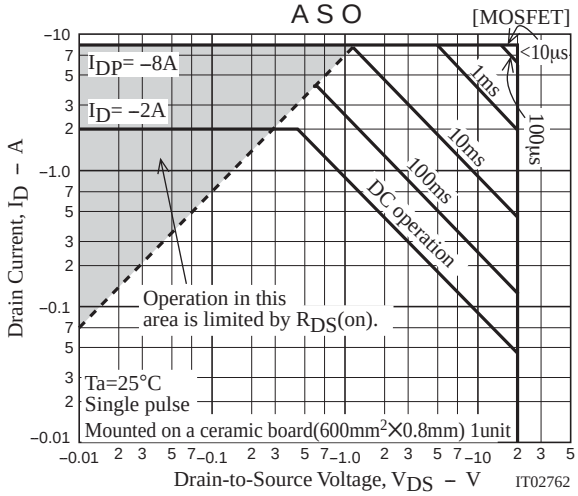

|yfs| – ID [MOSFET]
Forward Transfer Admittance, |yfs| – S
Drain Current, ID – A
IT02757
VDS= –10V
25°C
Ta= –25°C
75°C

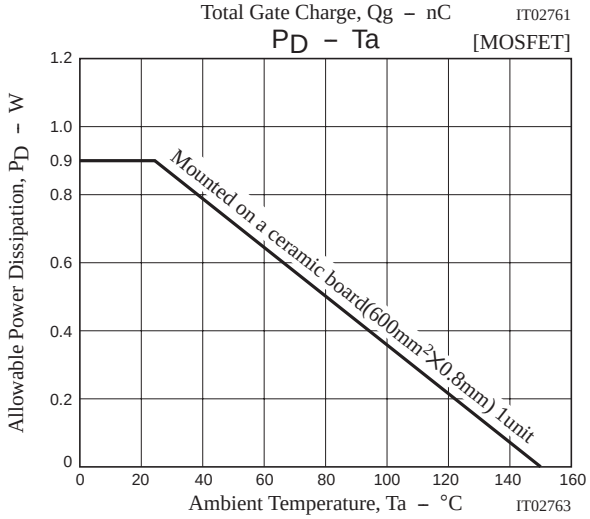

IF – VSD [MOSFET]
Forward Current, IF – A
Diode Forward Voltage, VSD – V
IT02758
VGS=0
Ta=75°C
25°C
–25°C

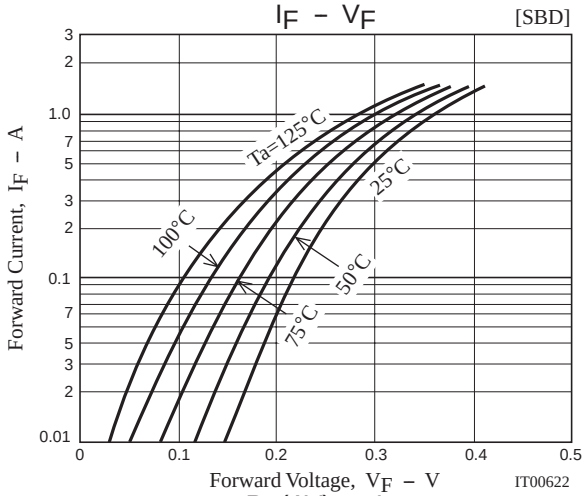

SW Time – ID [MOSFET]
Switching Time, SW Time – ns
Drain Current, ID – A
IT02759
VDD= –10V
VGS= –4V
td(off)
tf
tr
td(on)

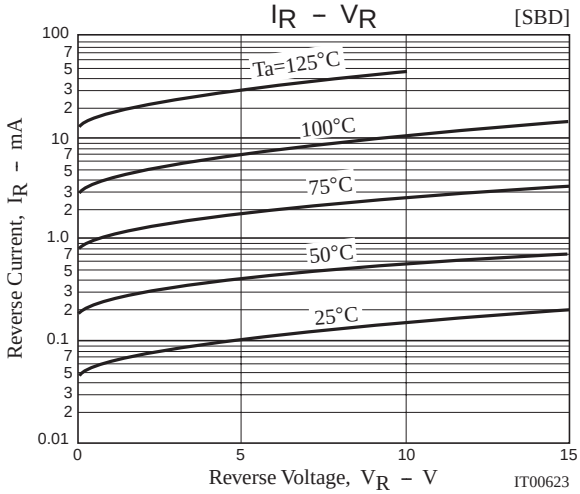

Ciss, Coss, Crss – VDS [MOSFET]
Ciss, Coss, Crss – pF
Drain-to-Source Voltage, VDS – V
IT02760
f=1MHz
Ciss
Coss
Crss

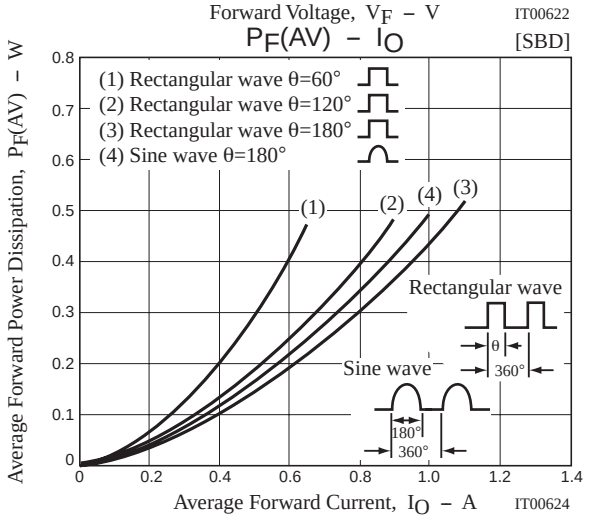

VGS – Qg
[MOSFET]
VDS= –10V
ID= –2A
Gate-to-Source Voltage, VGS – V
Total Gate Charge, Qg – nC
IT02761

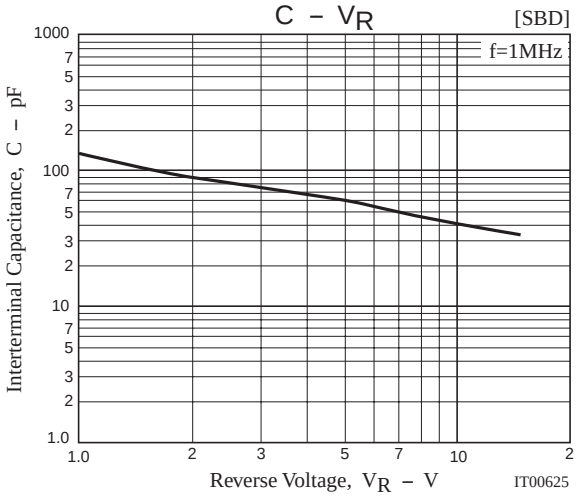

A S O
[MOSFET]
IDP= –8A
ID= –2A
1ms
10ms
100ms
DC operation
<10µs
100µs
Operation in this area is limited by RDS(on).
Ta=25°C
Single pulse
Mounted on a ceramic board(600mm2×0.8mm) 1unit
Drain Current, ID – A
Drain-to-Source Voltage, VDS – V
IT02762

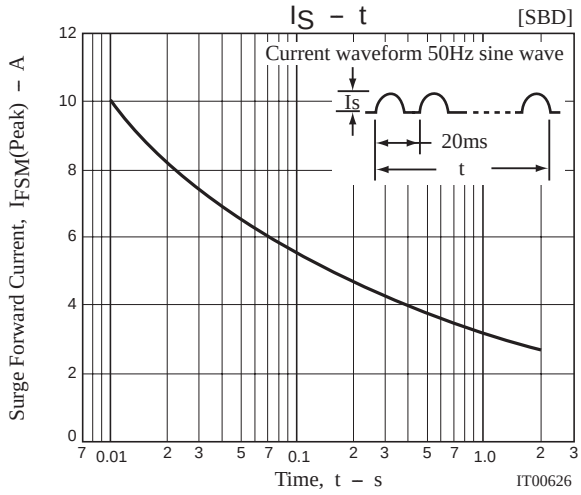

PD – Ta
[MOSFET]
Mounted on a ceramic board(600mm2×0.8mm) 1unit
Allowable Power Dissipation, PD – W
Ambient Temperature, Ta – °C
IT02763


IF – VF
[SBD]
Ta=125°C
100°C
75°C
50°C
25°C
Forward Current, IF – A
Forward Voltage, VF – V
IT00622


IR – VR
[SBD]
Ta=125°C
100°C
75°C
50°C
25°C
Reverse Current, IR – mA
Reverse Voltage, VR – V
IT00623


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
IT00624


C – VR
[SBD]
f=1MHz
Interterminal Capacitance, C – pF
Reverse Voltage, VR – V
IT00625



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