Ordering number : ENA0547

SANYO Semiconductors

DATA SHEET

CPH5857 — General-Purpose Switching Device Applications

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

Features

- 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.
- Ultrahigh-speed switching.
- 1.8V drive.

[SBD]
- Short reverse recovery time.
- Low forward voltage.
- Junction temperature 150°C guarantee.

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		−1.5	A
Drain Current (Pulse)	I_{DP}	PW≤10μs, duty cycle≤1%	−6.0	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 +150	°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 +150	°C
Storage Temperature	Tstg		−55 to +150	°C

Marking : YK

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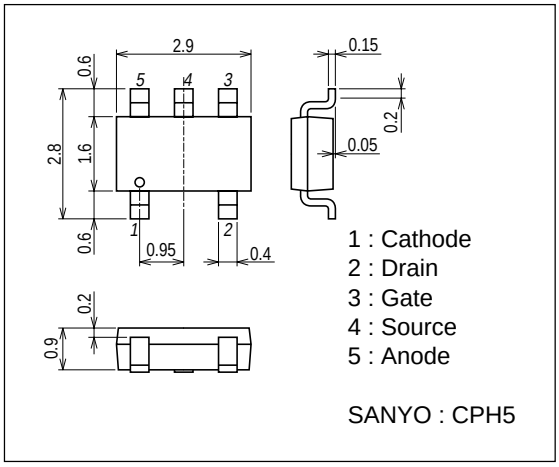
Electrical Characteristics at Ta=25°C

Parameter	Symbol	Conditions	Ratings			Unit
			min	typ	max	
[MOSFET]						
Drain-to-Source Breakdown Voltage	$V_{(BR)DSS}$	I_D=–1mA, V_{GS}=0V	–20			V
Zero-Gate Voltage Drain Current	I_{DSS}	V_{DS}=–20V, V_{GS}=0V			–1	μA
Gate-to-Source Leakage Current	I_{GSS}	V_{GS}=±8V, V_{DS}=0V			±10	μA
Cutoff Voltage	V_{GS}(off)	V_{DS}=–10V, I_D=–1mA	–0.4		–1.3	V
Forward Transfer Admittance	|yfs|	V_{DS}=–10V, I_D=–800mA	1.3	2.3		S
Static Drain-to-Source On-State Resistance	R_{DS}(on)1	I_D=–800mA, V_{GS}=–4V		180	235	mΩ
	R_{DS}(on)2	I_D=–400mA, V_{GS}=–2.5V		240	340	mΩ
	R_{DS}(on)3	I_D=–70mA, V_{GS}=–1.8V		350	600	mΩ
Input Capacitance	Ciss	V_{DS}=–10V, f=1MHz		290		pF
Output Capacitance	Coss	V_{DS}=–10V, f=1MHz		40		pF
Reverse Transfer Capacitance	Crss	V_{DS}=–10V, f=1MHz		25		pF
Turn-ON Delay Time	t_d(on)	See specified Test Circuit.		10		ns
Rise Time	t_r	See specified Test Circuit.		35		ns
Turn-OFF Delay Time	t_d(off)	See specified Test Circuit.		32		ns
Fall Time	t_f	See specified Test Circuit.		27		ns
Total Gate Charge	Qg	V_{DS}=–10V, V_{GS}=–4V, I_D=–1.5A		3.2		nC
Gate-to-Source Charge	Qgs	V_{DS}=–10V, V_{GS}=–4V, I_D=–1.5A		0.8		nC
Gate-to-Drain “Miller” Charge	Qgd	V_{DS}=–10V, V_{GS}=–4V, I_D=–1.5A		0.6		nC
Diode Forward Voltage	V_{SD}	I_S=–1.5A, V_{GS}=0V		–0.87	–1.2	V
[SBD]						
Reverse Voltage	V_R	I_R=0.2mA	15			V
Forward Voltage	V_F1	I_F=0.5A		0.44	0.49	V
	V_F2	I_F=1A		0.51	0.56	V
Reverse Current	I_R	V_R=7.5V			3	μA
Interterminal Capacitance	C	V_R=10V, f=1MHz, 1 cycle		20		pF
Reverse Recovery Time	t_{rr}	I_F=I_R=100mA, See specified Test Circuit.			10	ns

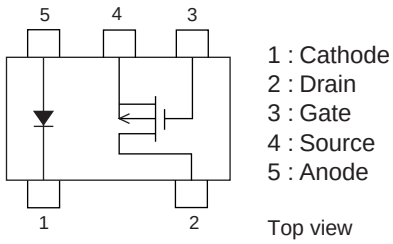
Package Dimensions

unit : mm (typ)

7017A-005

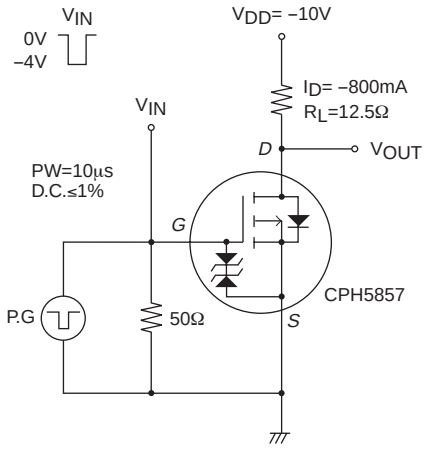


Electrical Connection



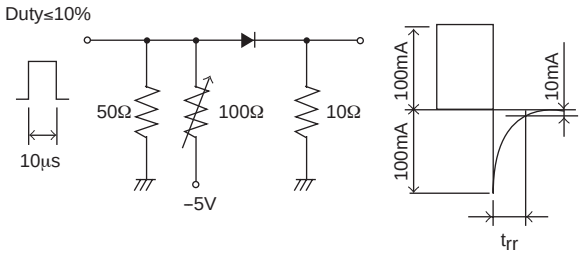
Switching Time Test Circuit

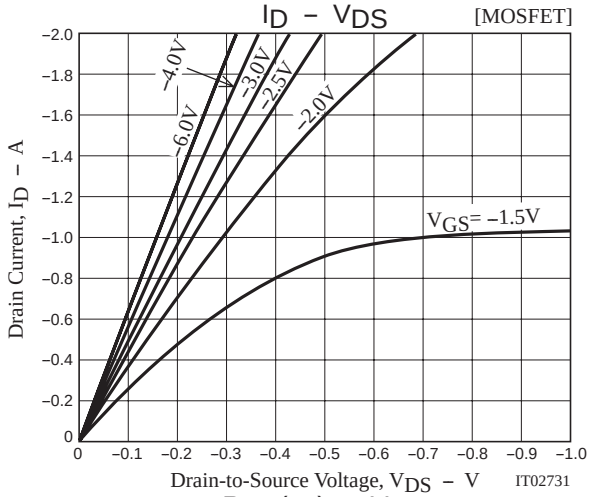
[MOSFET]

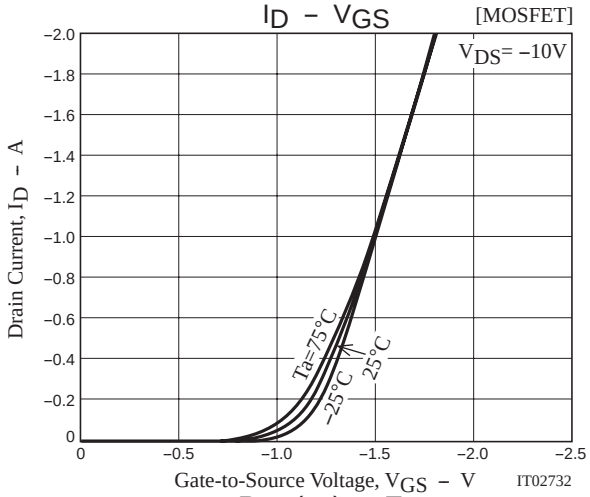


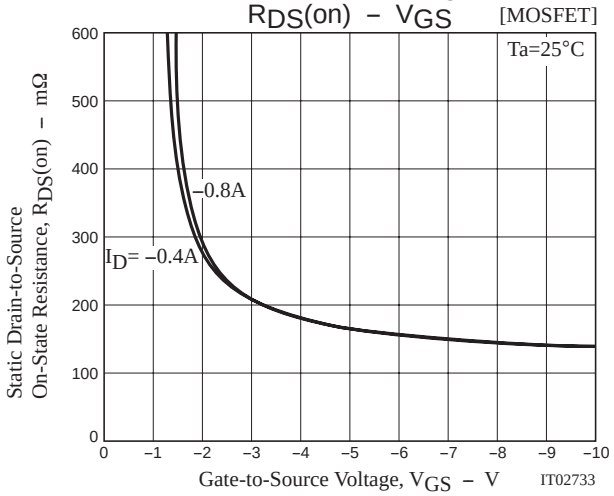
t_{rr} Test Circuit

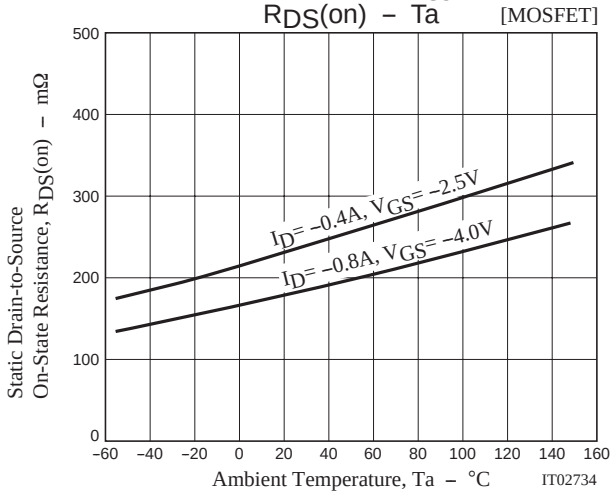
[SBD]

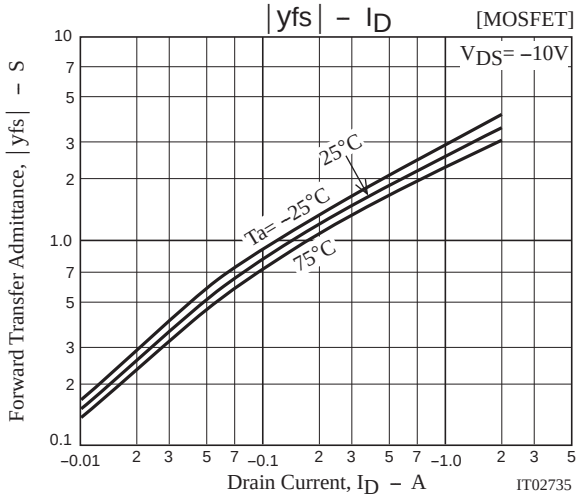


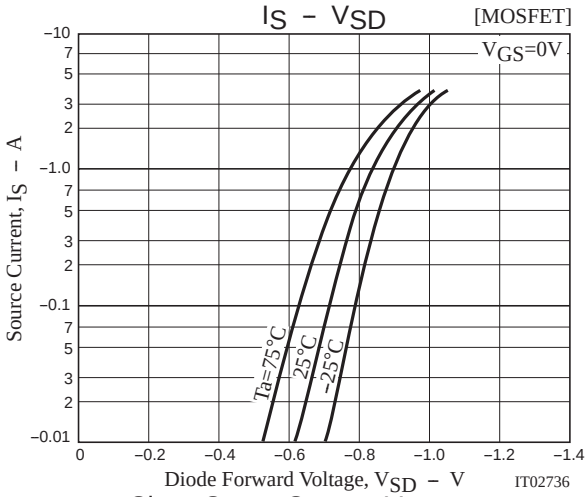


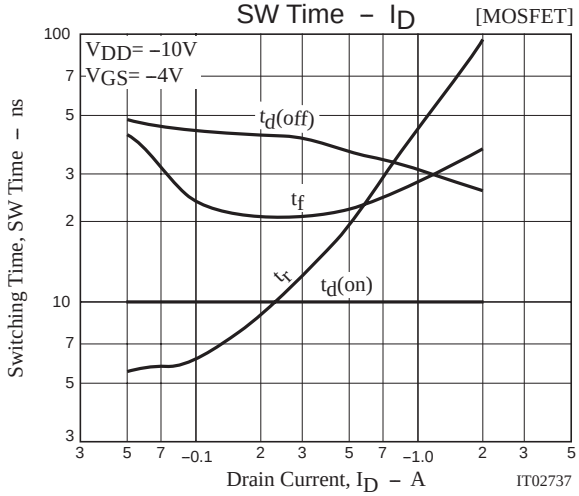


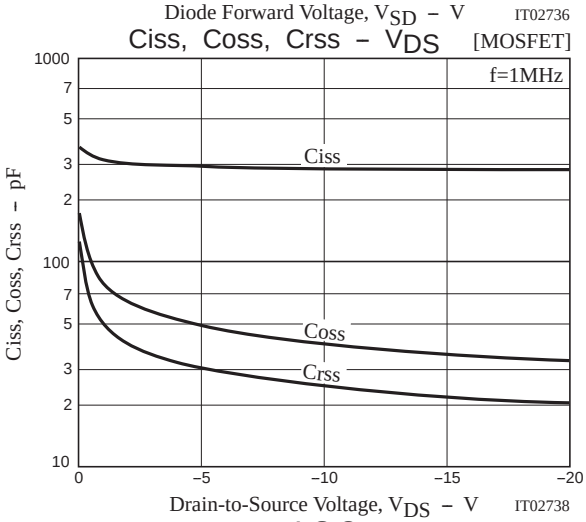


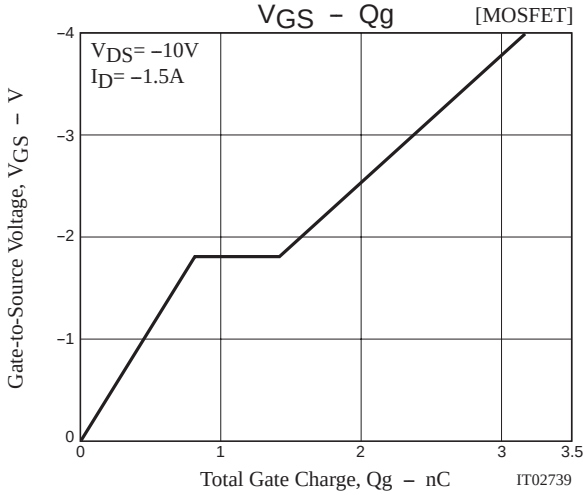


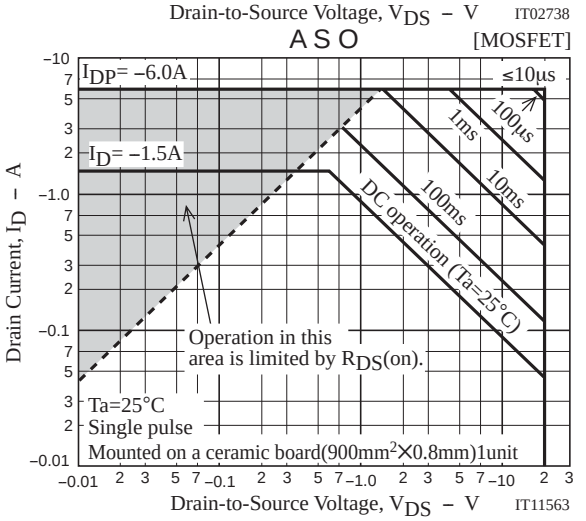

|yfs| – ID [MOSFET]
VDS= –10V
25°C
Ta= –25°C
75°C
Forward Transfer Admittance, |yfs| – S
Drain Current, ID – A
IT02735

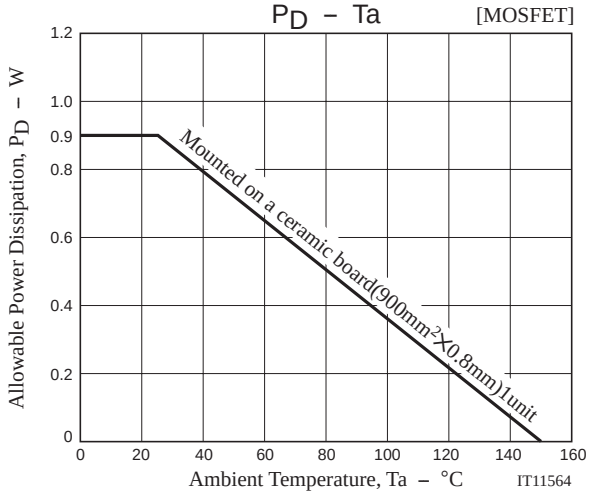

IS – VSD [MOSFET]
VGS=0V
Ta=75°C
25°C
–25°C
Source Current, IS – A
Diode Forward Voltage, VSD – V
IT02736


SW Time – ID [MOSFET]
VDD= –10V
VGS= –4V
td(off)
tf
tr
td(on)
Switching Time, SW Time – ns
Drain Current, ID – A
IT02737

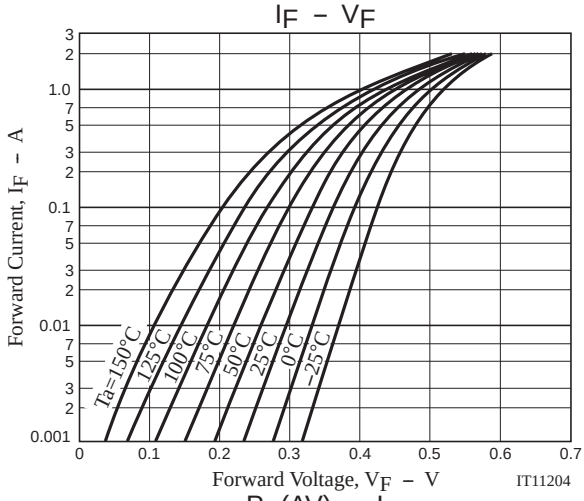

Ciss, Coss, Crss – VDS [MOSFET]
f=1MHz
Ciss
Coss
Crss
Ciss, Coss, Crss – pF
Drain-to-Source Voltage, VDS – V
IT02738


VGS – Qg [MOSFET]
VDS= –10V
ID= –1.5A
Gate-to-Source Voltage, VGS – V
Total Gate Charge, Qg – nC
IT02739


ASO [MOSFET]
IDP= –6.0A
ID= –1.5A
≤10μs
100μs
1ms
10ms
100ms
DC operation (Ta=25°C)
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
IT11563

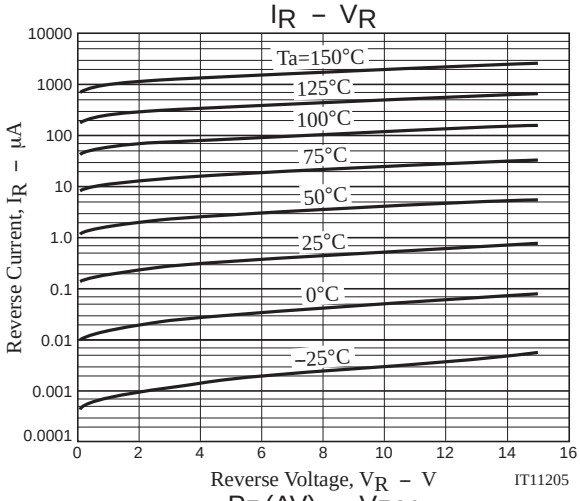

PD – Ta [MOSFET]
Mounted on a ceramic board(900mm2×0.8mm)1unit
Allowable Power Dissipation, PD – W
Ambient Temperature, Ta – °C
IT11564

$I_F - V_F$



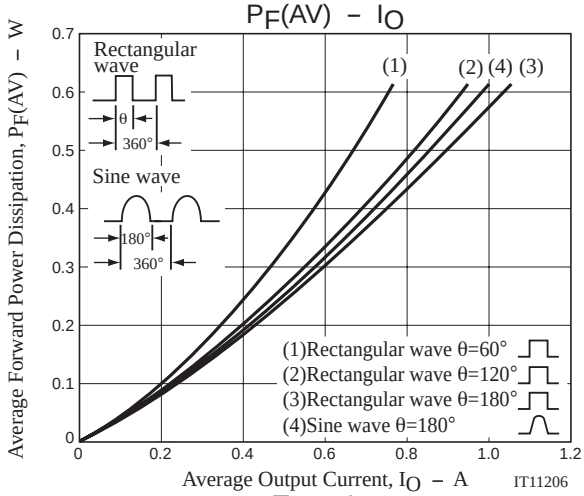
IT11204

$I_R - V_R$



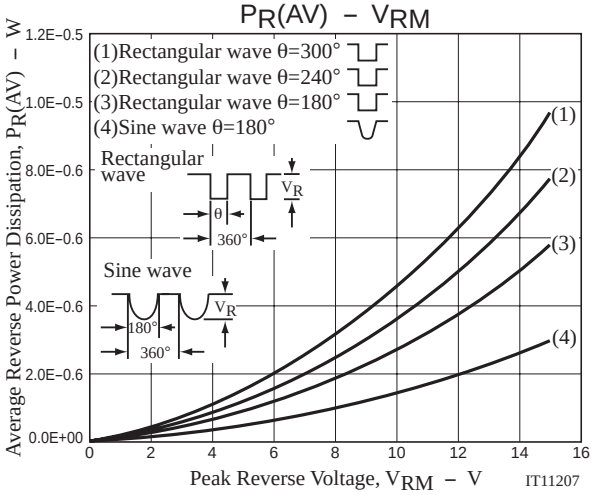
IT11205

$P_{F(AV)} - I_O$



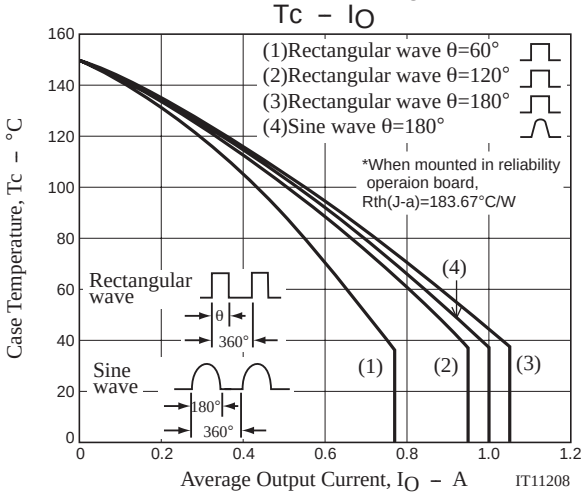
IT11206

$P_{R(AV)} - V_{RM}$



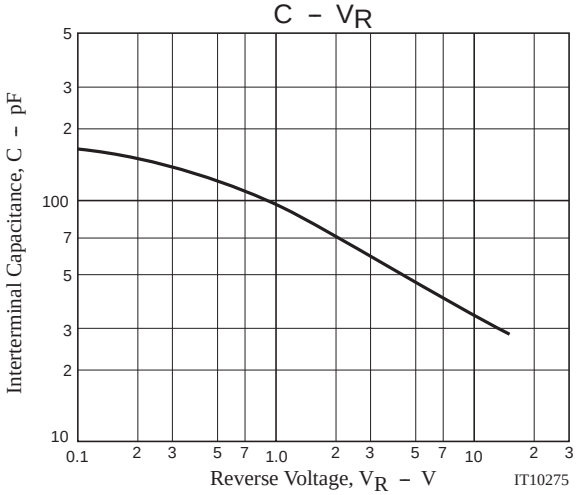
IT11207

$T_C - I_O$



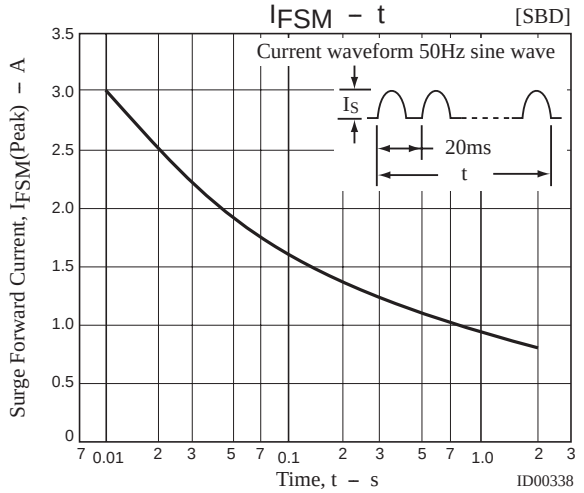
IT11208

$C - V_R$



IT10275

$I_{FSM} - t$ [SBD]



ID00338

Note on usage : Since the CPH5857 is a MOSFET product, please avoid using this device in the vicinity of highly charged objects.

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