Ordering number : ENA0961

SANYO Semiconductors
DATA SHEET

VEC2822 — General-Purpose Switching Device Applications

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

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
- Ultrahigh-speed switching.
- 1.8V drive.

[SBD]
- Low switching noise.
- Low leakage current and high reliability due to planar structure.

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		−3.5	A
Drain Current (Pulse)	I_{DP}	PW≤10μs, duty cycle≤1%	−14	A
Allowable Power Dissipation	P_D	Mounted on a ceramic board (1200mm²×0.8mm) 1unit	1.0	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}		17	V

Marking : CY

Continued on next page.

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Continued from preceding page.

Parameter	Symbol	Conditions	Ratings	Unit
Average Output Current	I_O	Mounted on a ceramic board (1200mm²×0.8mm) 1unit	2	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

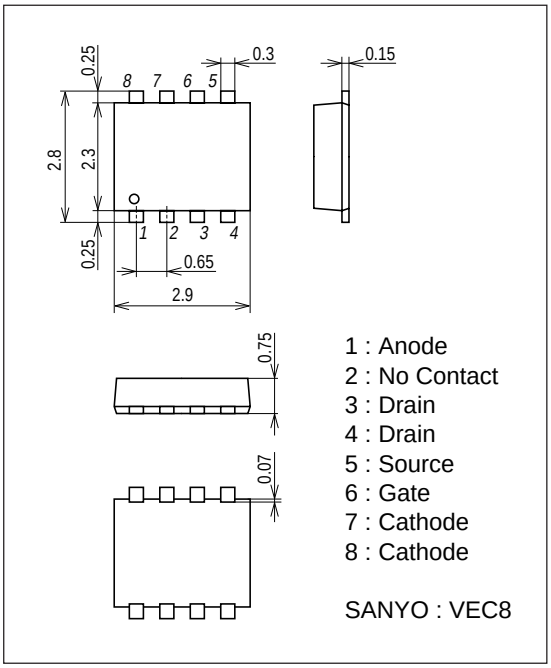
Electrical Characteristics at Ta=25°C

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		−1.4	V
Forward Transfer Admittance	|yfs|	V_{DS}=−10V, I_D=−2A	3.5	5.8		S
Static Drain-to-Source On-State Resistance	R_{DS}(on)1	I_D=−2A, V_{GS}=−4.5V		55	72	mΩ
	R_{DS}(on)2	I_D=−1A, V_{GS}=−2.5V		77	108	mΩ
	R_{DS}(on)3	I_D=−0.3A, V_{GS}=−1.8V		112	168	mΩ
Input Capacitance	Ciss	V_{DS}=−10V, f=1MHz		680		pF
Output Capacitance	Coss	V_{DS}=−10V, f=1MHz		115		pF
Reverse Transfer Capacitance	Crss	V_{DS}=−10V, f=1MHz		80		pF
Turn-ON Delay Time	t_d(on)	See specified Test Circuit.		12		ns
Rise Time	t_r	See specified Test Circuit.		57		ns
Turn-OFF Delay Time	t_d(off)	See specified Test Circuit.		68		ns
Fall Time	t_f	See specified Test Circuit.		58		ns
Total Gate Charge	Qg	V_{DS}=−10V, V_{GS}=−4.5V, I_D=−3.5A		8.7		nC
Gate-to-Source Charge	Qgs	V_{DS}=−10V, V_{GS}=−4.5V, I_D=−3.5A		1.5		nC
Gate-to-Drain “Miller” Charge	Qgd	V_{DS}=−10V, V_{GS}=−4.5V, I_D=−3.5A		1.8		nC
Diode Forward Voltage	V_{SD}	I_S=−3.5A, V_{GS}=0V		−0.83	−1.2	V
[SBD]						
Reverse Voltage	V_R	I_R=0.2mA	15			V
Forward Voltage	V_F	I_F=2A		0.5	0.56	V
Reverse Current	I_R	V_R=7.5V			30	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

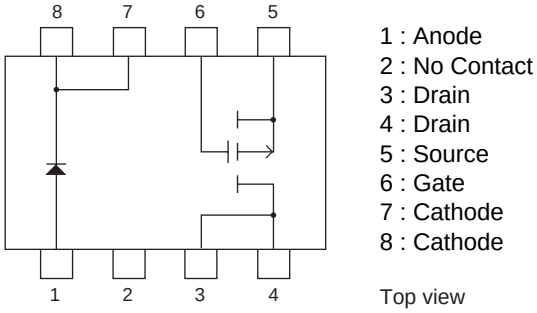
Package Dimensions

unit : mm (typ)

7012-005

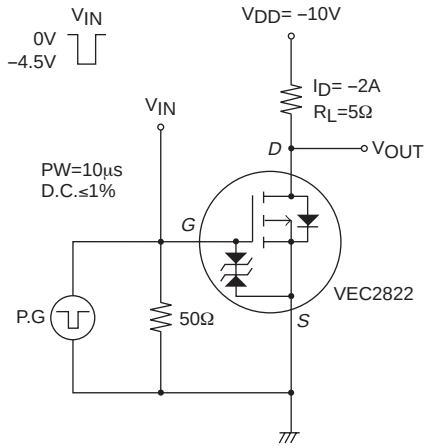


Electrical Connection



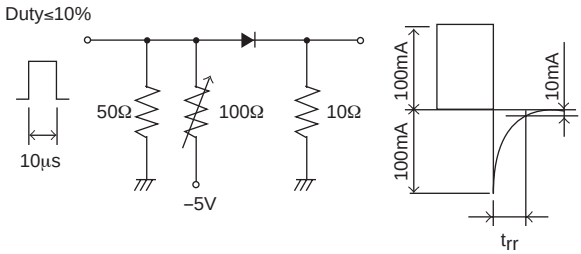
Switching Time Test Circuit

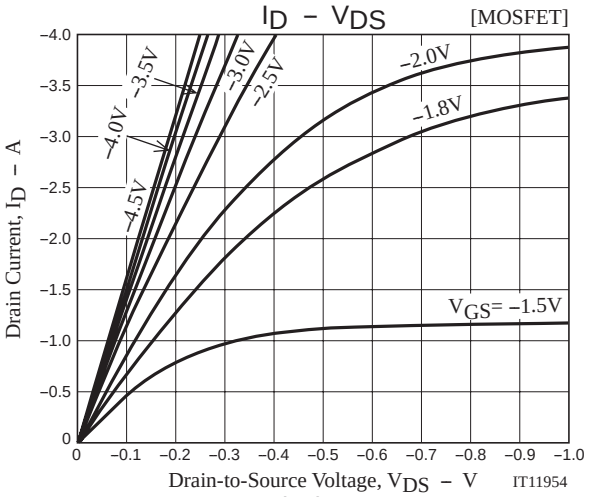
[MOSFET]

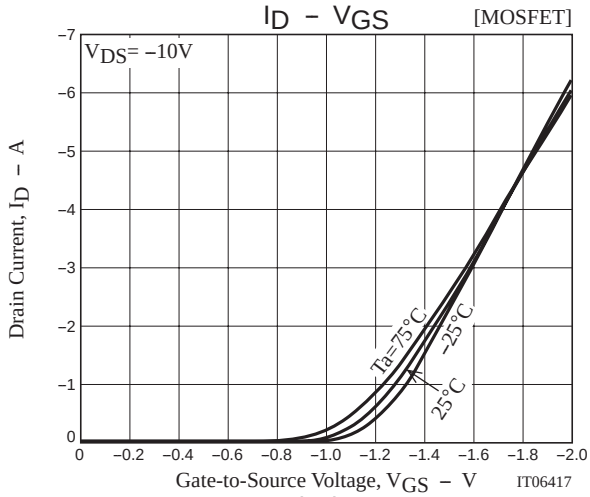


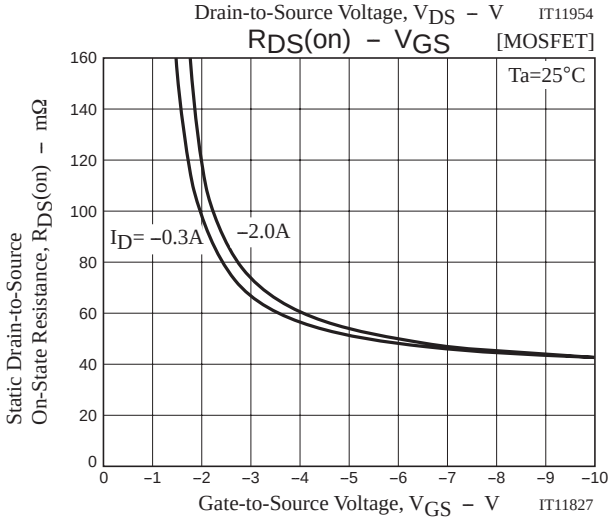
t_{rr} Test Circuit

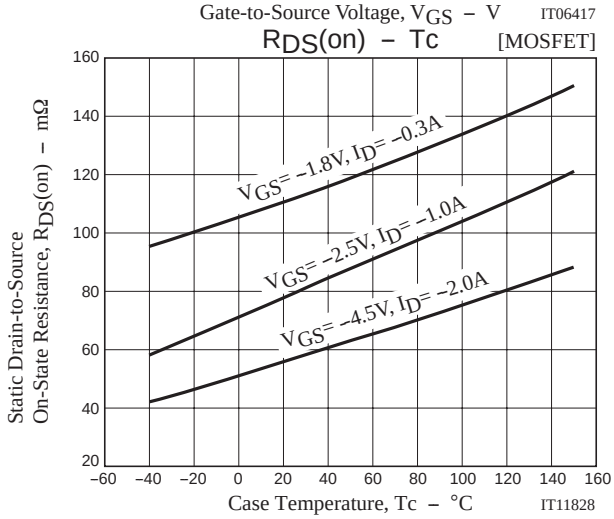
[SBD]

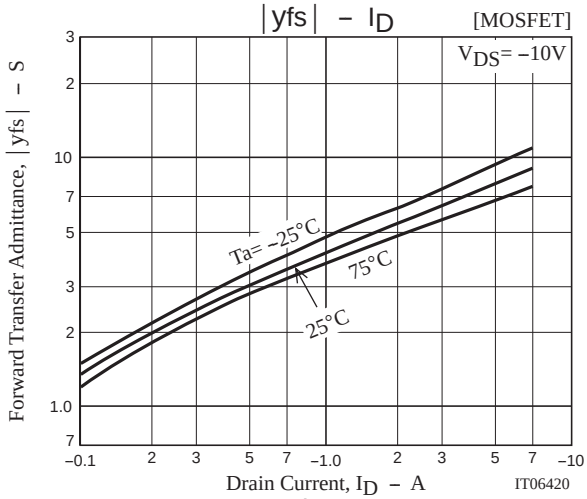


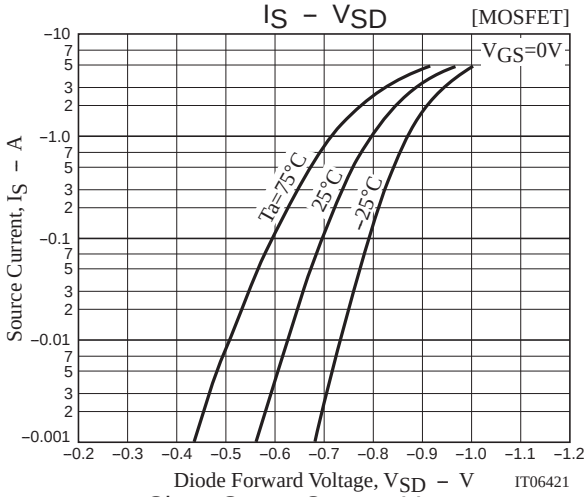


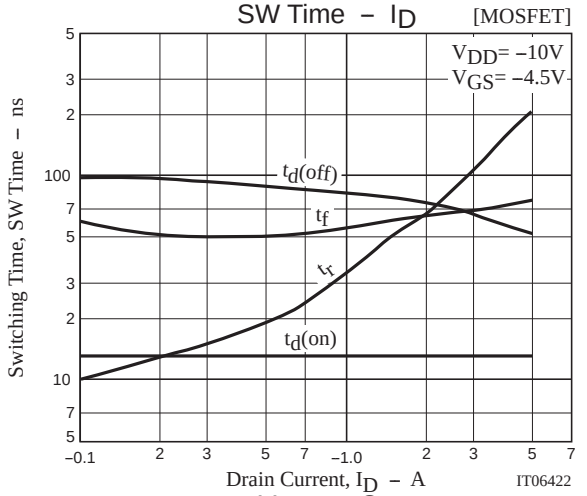


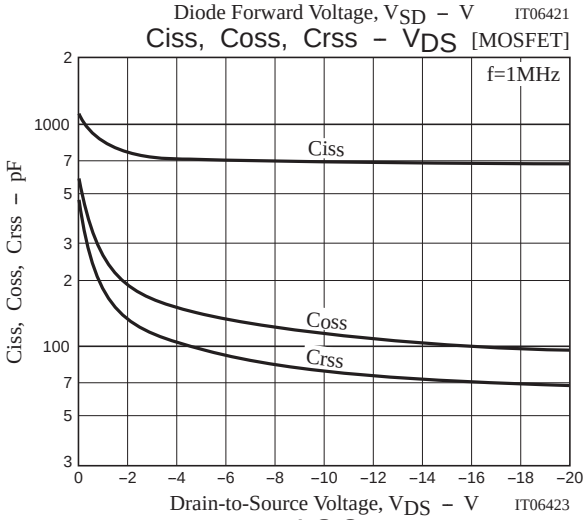


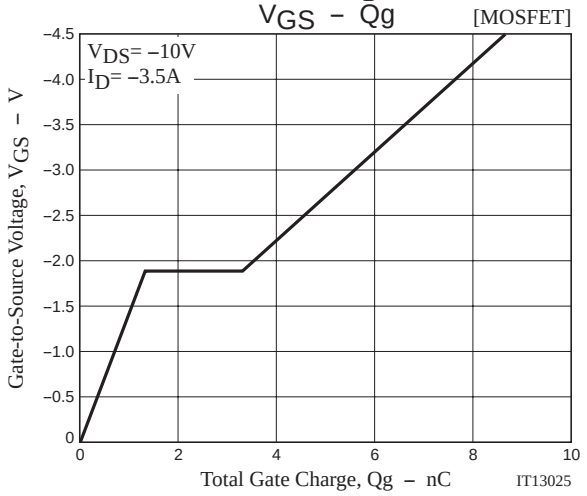


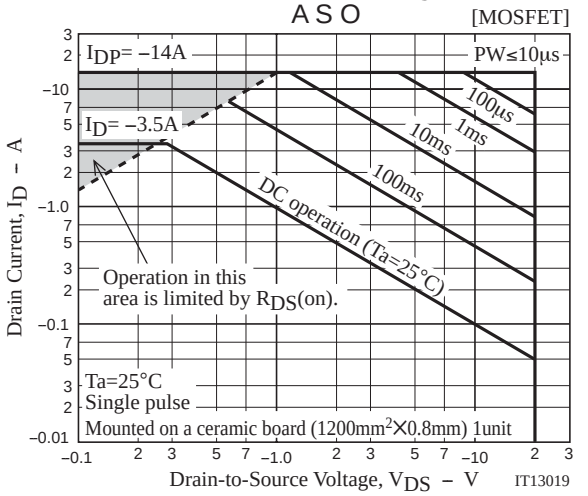

|yfs| – ID [MOSFET]
VDS= –10V
Ta= –25°C
75°C
25°C
Forward Transfer Admittance, |yfs| – S
Drain Current, ID – A
IT06420

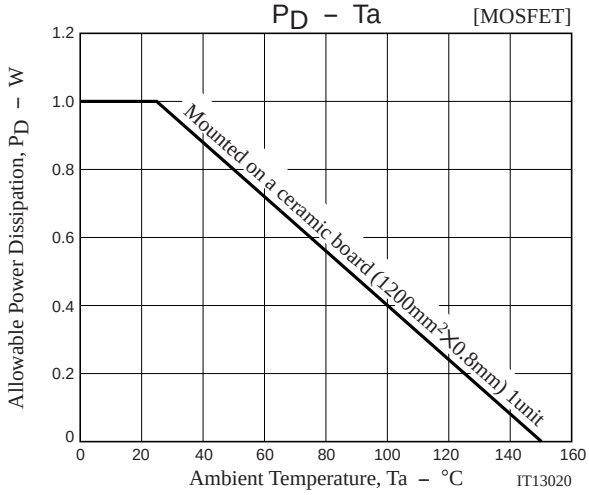

IS – VSD [MOSFET]
VGS=0V
Ta=75°C
25°C
–25°C
Source Current, IS – A
Diode Forward Voltage, VSD – V
IT06421


SW Time – ID [MOSFET]
VDD= –10V
VGS= –4.5V
td(off)
tf
tr
td(on)
Switching Time, SW Time – ns
Drain Current, ID – A
IT06422

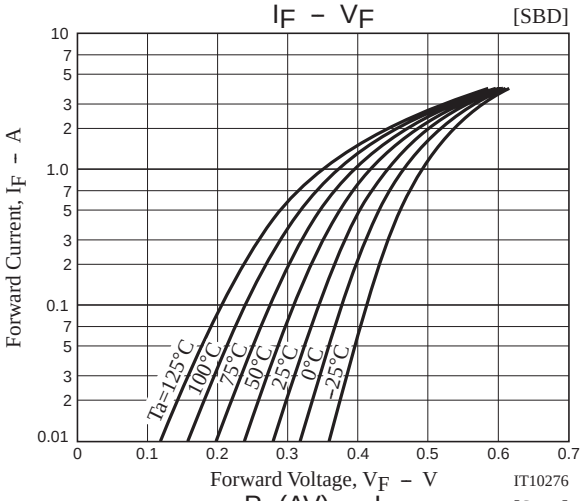

Ciss, Coss, Crss – VDS [MOSFET]
f=1MHz
Ciss
Coss
Crss
Ciss, Coss, Crss – pF
Drain-to-Source Voltage, VDS – V
IT06423


VGS – Qg [MOSFET]
VDS= –10V
ID= –3.5A
Gate-to-Source Voltage, VGS – V
Total Gate Charge, Qg – nC
IT13025


ASO [MOSFET]
IDP= –14A
PW≤10μs
ID= –3.5A
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 (1200mm2×0.8mm) 1unit
Drain Current, ID – A
Drain-to-Source Voltage, VDS – V
IT13019

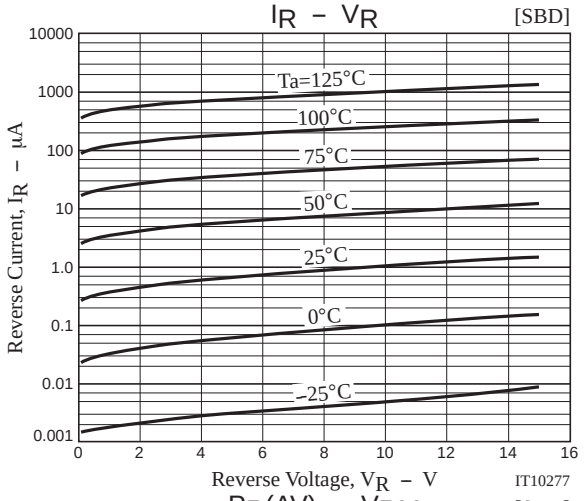

PD – Ta [MOSFET]
Mounted on a ceramic board (1200mm2×0.8mm) 1unit
Allowable Power Dissipation, PD – W
Ambient Temperature, Ta – °C
IT13020

$I_F - V_F$ [SBD]



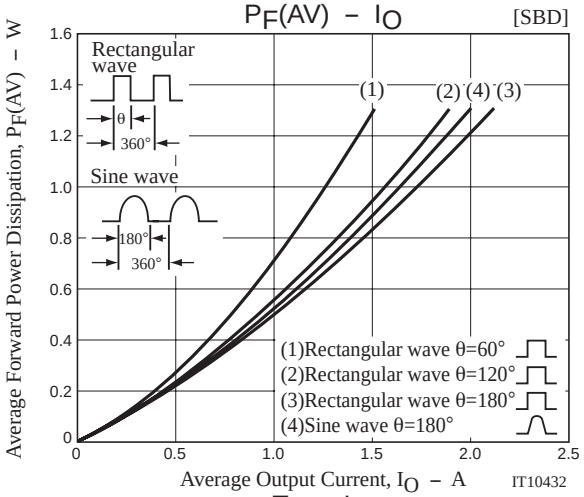
IT10276

$I_R - V_R$ [SBD]



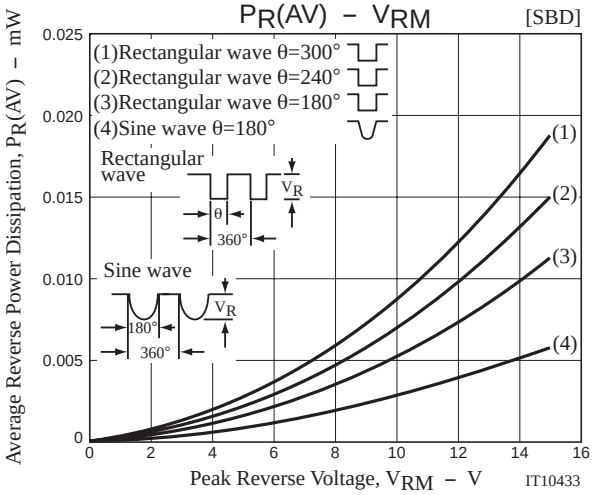
IT10277

$P_{F(AV)} - I_O$ [SBD]



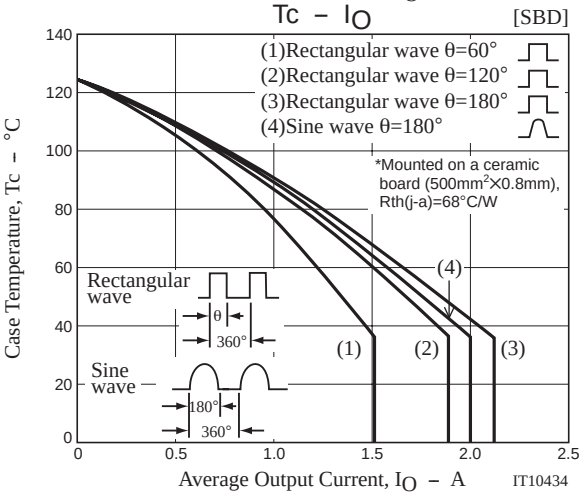
IT10432

$P_{R(AV)} - V_{RM}$ [SBD]



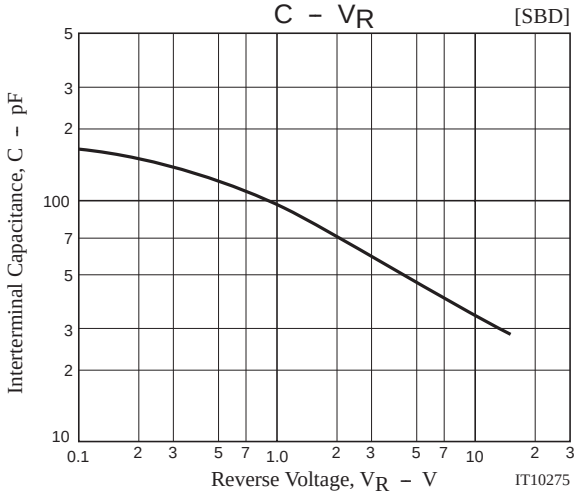
IT10433

$T_C - I_O$ [SBD]



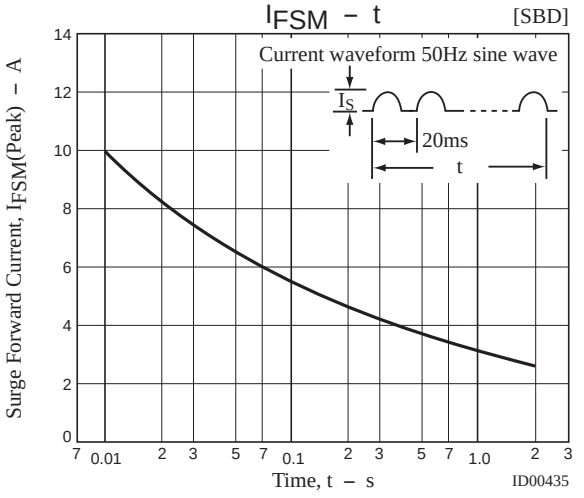
IT10434

$C - V_R$ [SBD]



IT10275

$I_{FSM} - t$ [SBD]



ID00435

Note on usage : Since the VEC2822 is a MOSFET product, please avoid using this device in the vicinity of highly charged objects.

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