Ordering number : ENA1357

SANYO Semiconductors
DATA SHEET

An ON Semiconductor Company

P-Channel Silicon MOSFET

BBS3002 — General-Purpose Switching Device Applications

Features

- 4V drive.
- Load switching applications.
- Avalanche resistance guarantee.

Specifications

Absolute Maximum Ratings at Ta=25°C

Parameter	Symbol	Conditions	Ratings	Unit
Drain-to-Source Voltage	V_{DSS}		−60	V
Gate-to-Source Voltage	V_{GSS}		±20	V
Drain Current (DC)	I_D		−100	A
Drain Current (Pulse)	I_{DP}	PW≤10μs, duty cycle≤1%	−400	A
Allowable Power Dissipation	P_D	Tc=25°C	90	W
Channel Temperature	Tch		150	°C
Storage Temperature	Tstg		−55 to +150	°C
Avalanche Energy (Single Pulse) *1	E_{AS}		340	mJ
Avalanche Current *2	I_{AV}		−60	A

Note :*1 V_{DD}=−30V, L=100μH, I_{AV}=−60A
*2 L≤100μH, Single pulse

Electrical Characteristics at Ta=25°C

Parameter	Symbol	Conditions	Ratings			Unit
			min	typ	max	
Drain-to-Source Breakdown Voltage	$V_{(BR)DSS}$	I_D=−1mA, V_{GS}=0V	−60			V
Zero-Gate Voltage Drain Current	I_{DSS}	V_{DS}=−60V, V_{GS}=0V			−1	μA
Gate-to-Source Leakage Current	I_{GSS}	V_{GS}=±16V, V_{DS}=0V			±10	μA
Cutoff Voltage	$V_{GS(off)}$	V_{DS}=−10V, I_D=−1mA	−1.2		−2.6	V

Marking : BS3002

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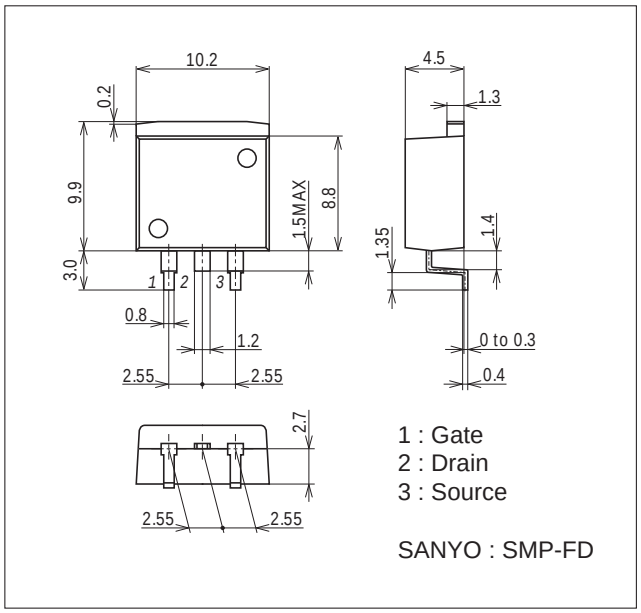
Parameter	Symbol	Conditions	Ratings			Unit
			min	typ	max	
Forward Transfer Admittance	| yfs |	V_{DS}=−10V, I_D=−50A	54	90		S
Static Drain-to-Source On-State Resistance	R_{DS}(on)1	I_D=−50A, V_{GS}=−10V		4.4	5.8	mΩ
	R_{DS}(on)2	I_D=−50A, V_{GS}=−4V		6.4	9.0	mΩ
Input Capacitance	Ciss	V_{DS}=−20V, f=1MHz		13200		pF
Output Capacitance	Coss	V_{DS}=−20V, f=1MHz		1300		pF
Reverse Transfer Capacitance	Crss	V_{DS}=−20V, f=1MHz		950		pF
Turn-ON Delay Time	t_d(on)	See specified Test Circuit.		95		ns
Rise Time	t_r	See specified Test Circuit.		1000		ns
Turn-OFF Delay Time	t_d(off)	See specified Test Circuit.		800		ns
Fall Time	t_f	See specified Test Circuit.		820		ns
Total Gate Charge	Qg	V_{DS}=−30V, V_{GS}=−10V, I_D=−100A		280		nC
Gate-to-Source Charge	Qgs	V_{DS}=−30V, V_{GS}=−10V, I_D=−100A		50		nC
Gate-to-Drain “Miller” Charge	Qgd	V_{DS}=−30V, V_{GS}=−10V, I_D=−100A		55		nC
Diode Forward Voltage	V_{SD}	I_S=−100A, V_{GS}=0V		−1.0	−1.5	V

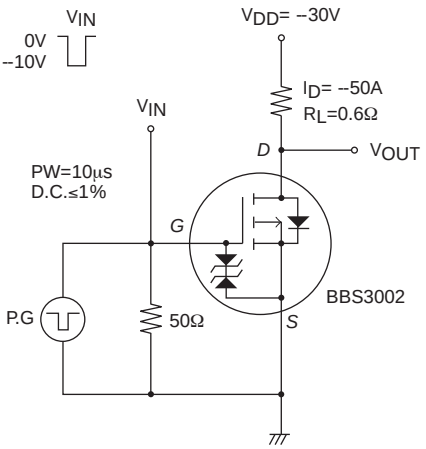
Package Dimensions

unit : mm (typ)

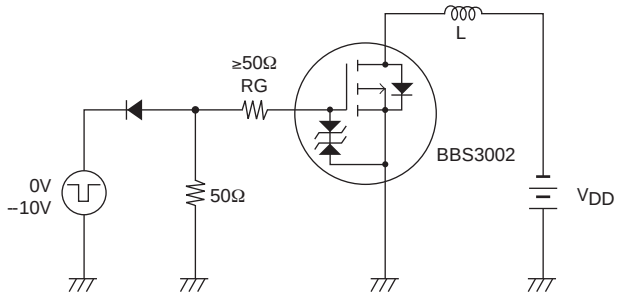
7001-003

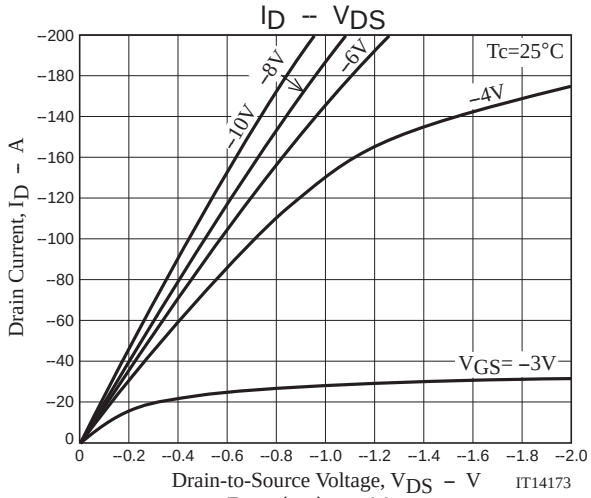


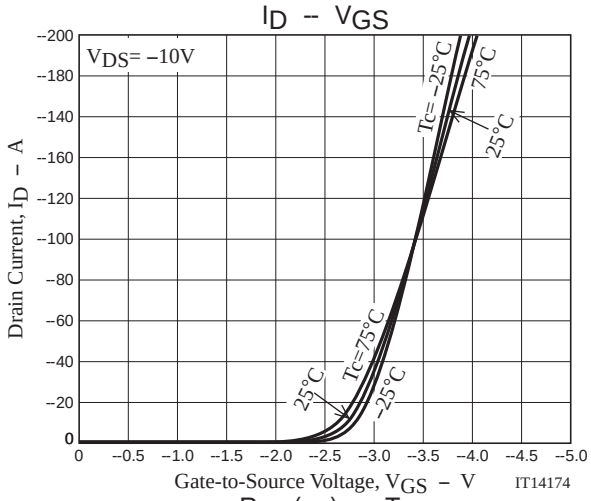
Switching Time Test Circuit

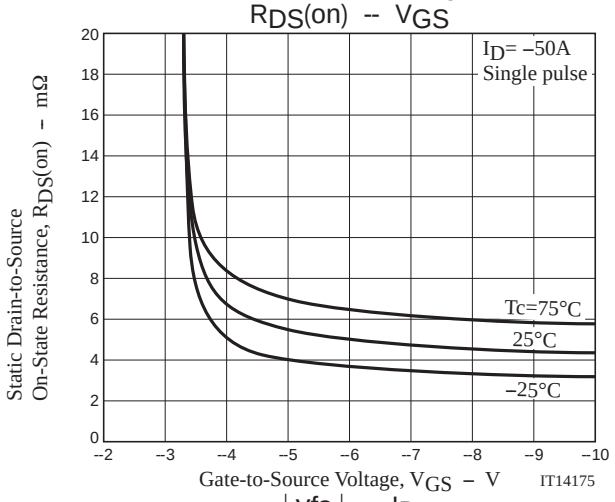


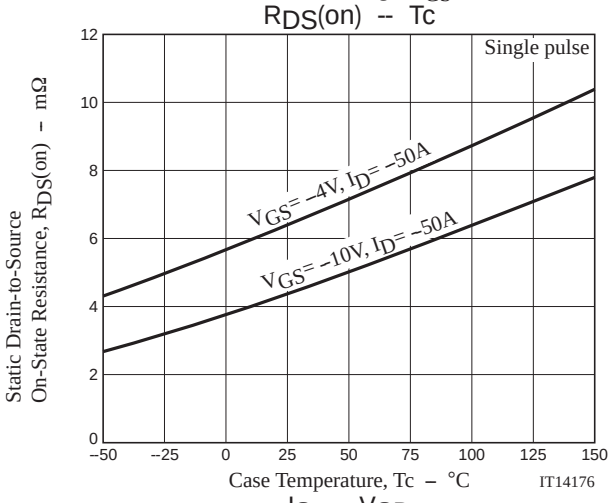
Avalanche Resistance Test Circuit

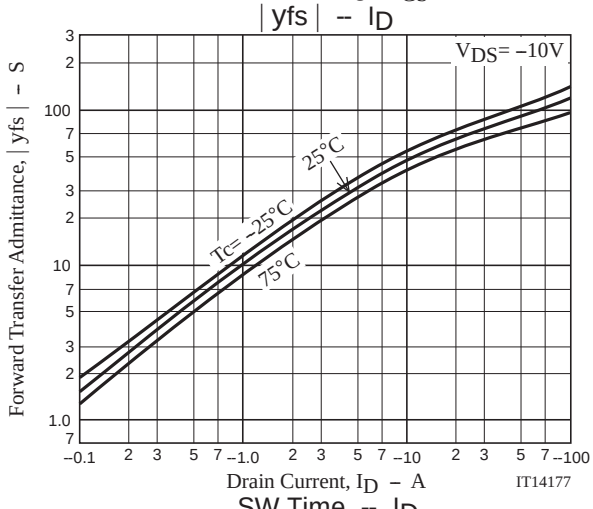


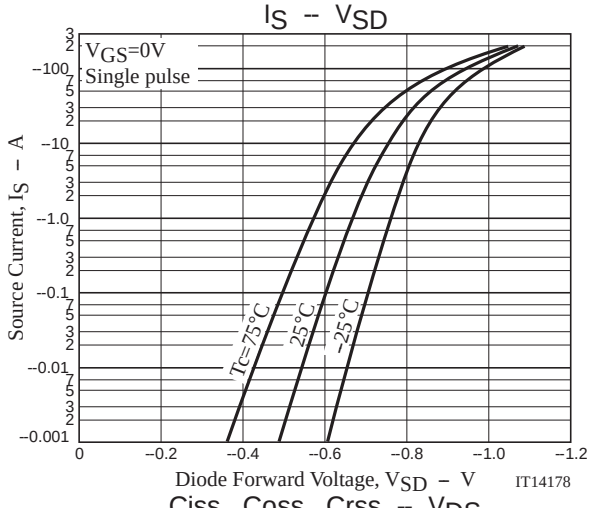

ID -- VDS
Tc=25°C
–10V
–8V
–6V
–4V
VGS= –3V
Drain Current, ID – A
Drain-to-Source Voltage, VDS – V
IT14173

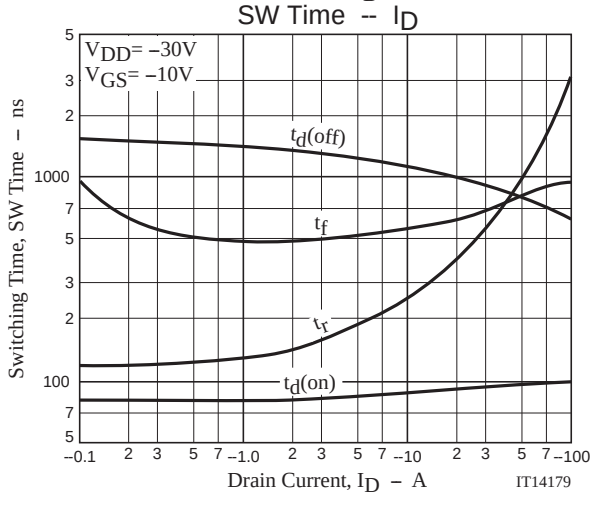

ID -- VGS
VDS= –10V
Tc= –25°C
75°C
25°C
Drain Current, ID – A
Gate-to-Source Voltage, VGS – V
IT14174

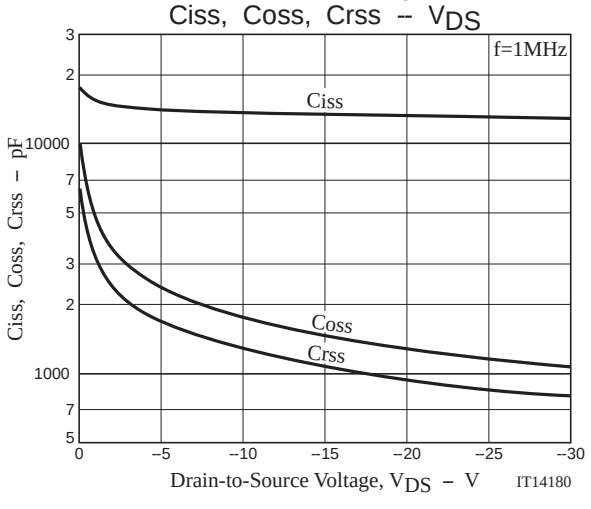

RDS(on) -- VGS
ID= –50A
Single pulse
Tc=75°C
25°C
–25°C
Static Drain-to-Source On-State Resistance, RDS(on) – mΩ
Gate-to-Source Voltage, VGS – V
IT14175

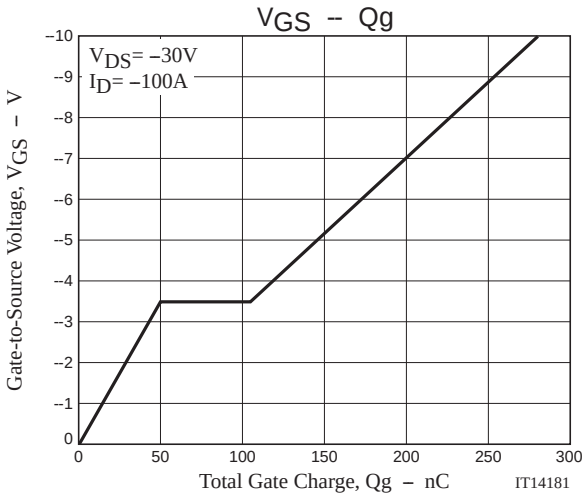

RDS(on) -- Tc
Single pulse
VGS= –4V, ID= –50A
VGS= –10V, ID= –50A
Static Drain-to-Source On-State Resistance, RDS(on) – mΩ
Case Temperature, Tc – °C
IT14176

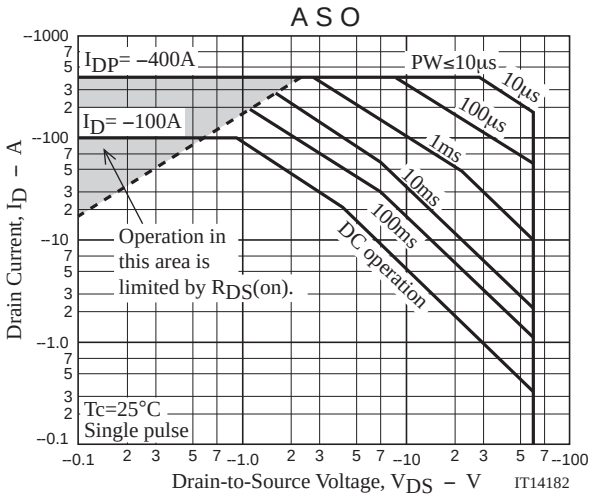

| yfs | -- ID
VDS= –10V
25°C
Tc= –25°C
75°C
Forward Transfer Admittance, | yfs | – S
Drain Current, ID – A
IT14177

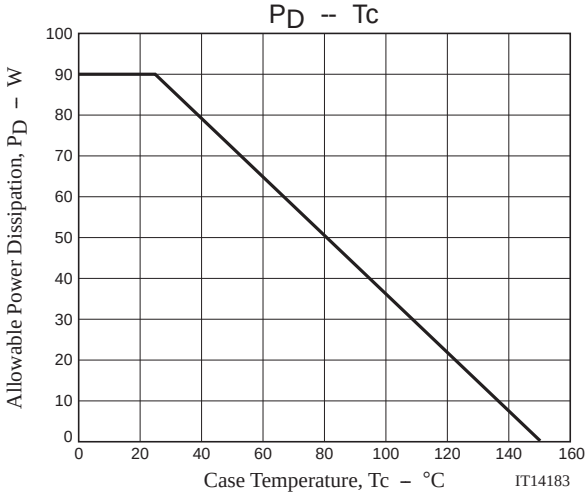

IS -- VSD
VGS=0V
Single pulse
Tc=75°C
25°C
–25°C
Source Current, IS – A
Diode Forward Voltage, VSD – V
IT14178

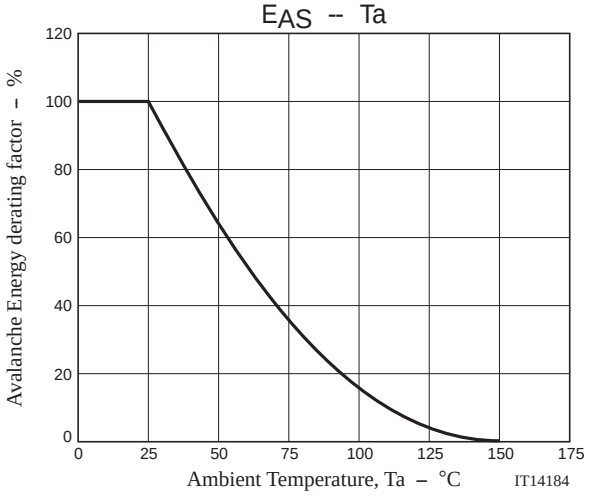

SW Time -- ID
VDD= –30V
VGS= –10V
td(off)
tf
tr
td(on)
Switching Time, SW Time – ns
Drain Current, ID – A
IT14179


Ciss, Coss, Crss -- VDS
f=1MHz
Ciss
Coss
Crss
Ciss, Coss, Crss – pF
Drain-to-Source Voltage, VDS – V
IT14180









Note on usage : Since the BBS3002 is a MOSFET product, please avoid using this device in the vicinity of highly charged objects.