Ordering number : ENA1923

SANYO Semiconductors

DATA SHEET

N-Channel Silicon MOSFET

BMS4003 — General-Purpose Switching Device Applications

Features

- ON-resistance $R_{DS}(on)$=50mΩ (typ.)
- Input capacitance Ciss=680pF (typ.)
- 10V drive

Specifications

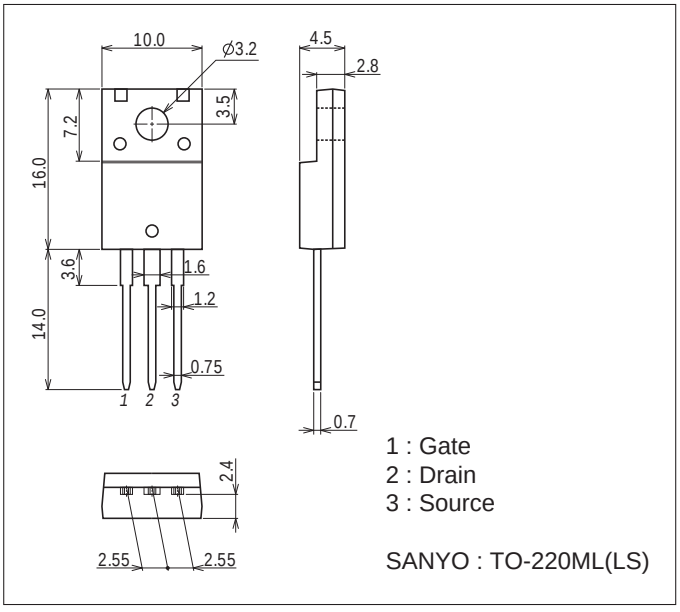
Absolute Maximum Ratings at Ta=25°C

Parameter	Symbol	Conditions	Ratings	Unit
Drain-to-Source Voltage	V_{DSS}		100	V
Gate-to-Source Voltage	V_{GSS}		±30	V
Drain Current (DC)	I_D		18	A
Drain Current (Pulse)	I_{DP}	PW≤10μs, duty cycle≤1%	72	A
Allowable Power Dissipation	P_D		2.0	W
		Tc=25°C	25	W
Channel Temperature	Tch		150	°C
Storage Temperature	Tstg		−55 to +150	°C
Avalanche Energy (Single Pulse) *1	E_{AS}		53	mJ
Avalanche Current *2	I_{AV}		15	A

Note :*1 V_{DD}=60V, L=200μH, I_{AV}=15A (Fig.1)
*2 L≤200μH, Single pulse

Package Dimensions

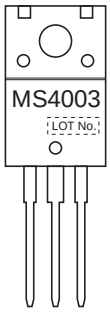
unit : mm (typ)
7525-002



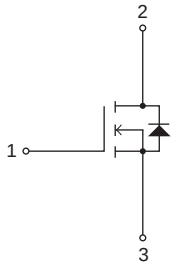
Product & Package Information

- Package : TO-220ML(LS)
- JEITA, JEDEC : SC-67, SOT-186A
- Minimum Packing Quantity : 100 pcs./bag or 50pcs./magazine

Marking



Electrical Connection



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	100			V
Zero-Gate Voltage Drain Current	I_{DSS}	V_{DS}=100V, V_{GS}=0V			1	μA
Gate-to-Source Leakage Current	I_{GSS}	V_{GS}=±30V, V_{DS}=0V			±100	nA
Cutoff Voltage	V_{GS}(off)	V_{DS}=10V, I_D=1mA	3		5	V
Forward Transfer Admittance	| yfs |	V_{DS}=10V, I_D=9A		7.8		S
Static Drain-to-Source On-State Resistance	R_{DS}(on)	I_D=9A, V_{GS}=10V		50	65	mΩ
Input Capacitance	Ciss	V_{DS}=20V, f=1MHz		680		pF
Output Capacitance	Coss			130		pF
Reverse Transfer Capacitance	Crss			33		pF
Turn-ON Delay Time	t_d(on)	See Fig.2		16		ns
Rise Time	t_r			33		ns
Turn-OFF Delay Time	t_d(off)			27		ns
Fall Time	t_f			15		ns
Total Gate Charge	Qg	V_{DS}=60V, V_{GS}=10V, I_D=18A		11.4		nC
Gate-to-Source Charge	Qgs			4.1		nC
Gate-to-Drain “Miller” Charge	Qgd			3.8		nC
Diode Forward Voltage	V_{SD}	I_S=18A, V_{GS}=0V		0.9	1.2	V
Reverse Recovery Time	t_{rr}	See Fig.3		60		ns
Reverse Recovery Charge	Q_{rr}	I_S=18A, V_{GS}=0V, di/dt=100A/μs		114		nC

Fig.1 Avalanche Resistance Test Circuit

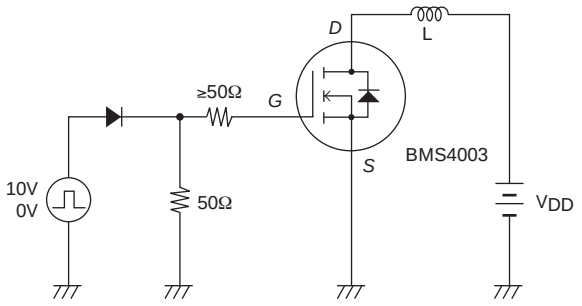


Fig.2 Switching Time Test Circuit

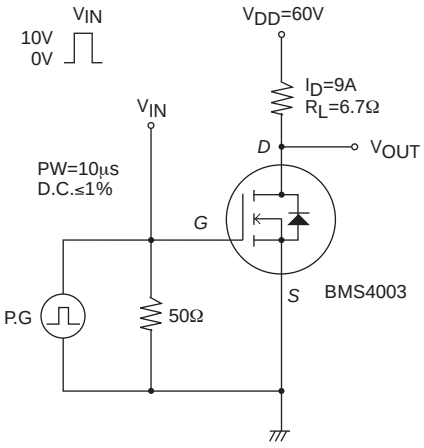
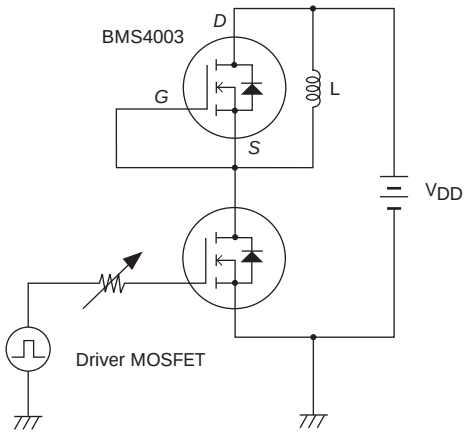
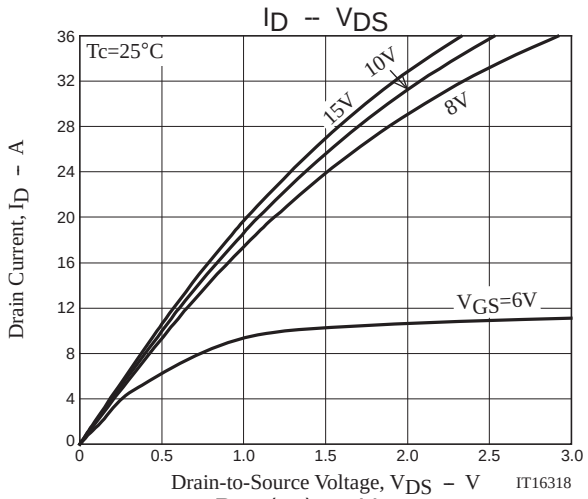
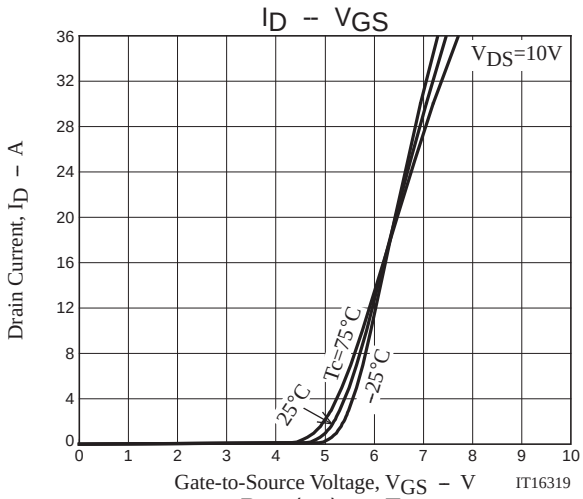
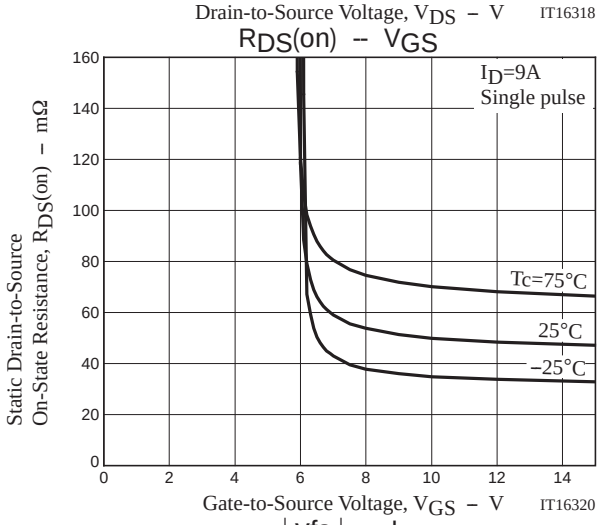


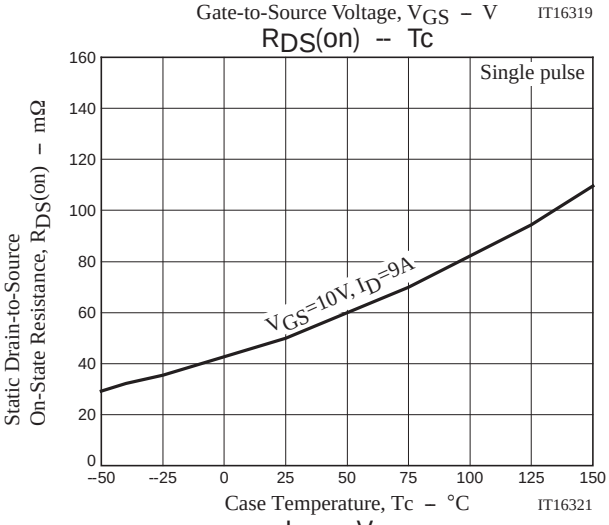
Fig.3 Reverse Recovery Time Test Circuit

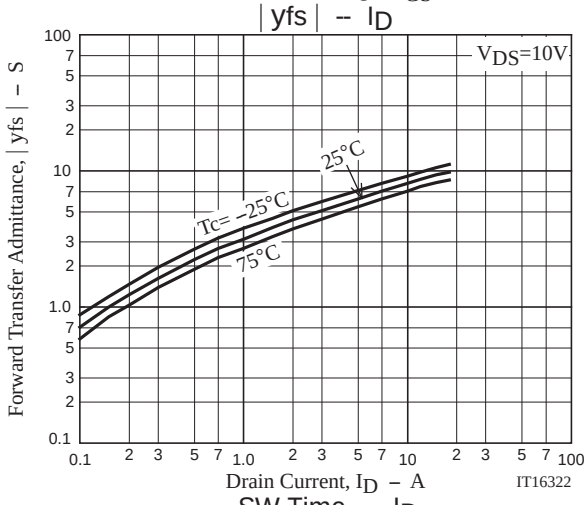


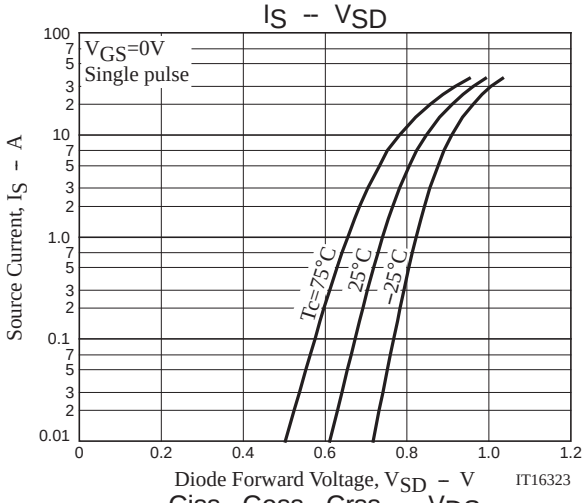

ID -- VDS
Tc=25°C
10V
15V
8V
VGS=6V
Drain Current, ID – A
Drain-to-Source Voltage, VDS – V
IT16318

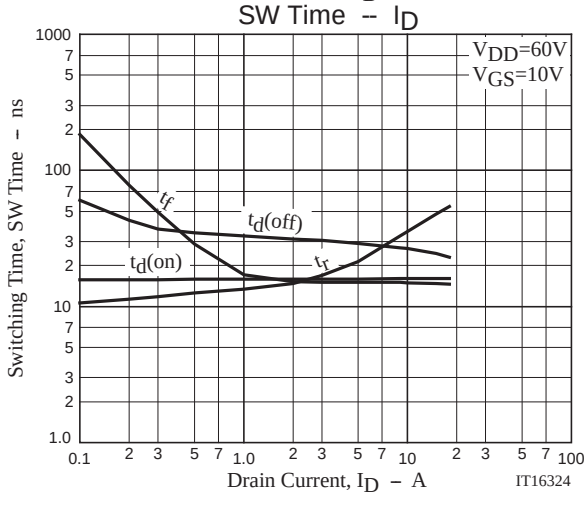

ID -- VGS
VDS=10V
25°C
Tc=75°C
–25°C
Drain Current, ID – A
Gate-to-Source Voltage, VGS – V
IT16319

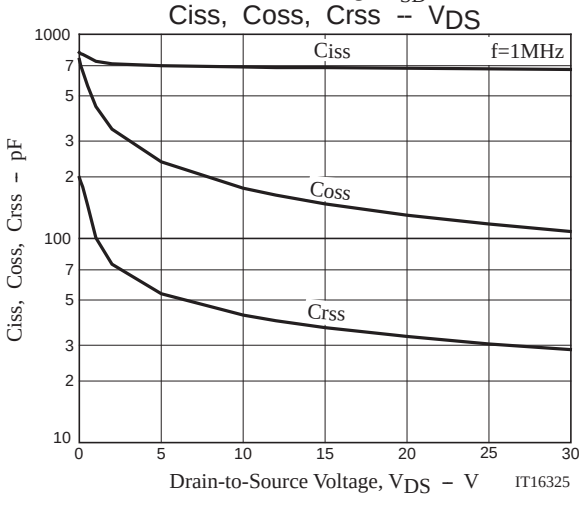

RDS(on) -- VGS
ID=9A
Single pulse
Tc=75°C
25°C
–25°C
Static Drain-to-Source On-State Resistance, RDS(on) – mΩ
Gate-to-Source Voltage, VGS – V
IT16320

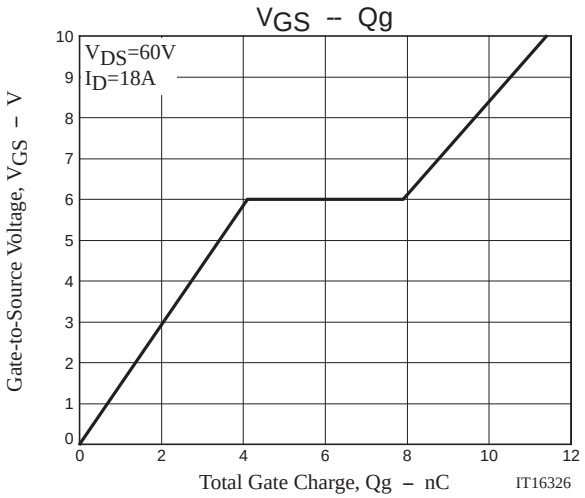

RDS(on) -- Tc
Single pulse
VGS=10V, ID=9A
Static Drain-to-Source On-State Resistance, RDS(on) – mΩ
Case Temperature, Tc – °C
IT16321

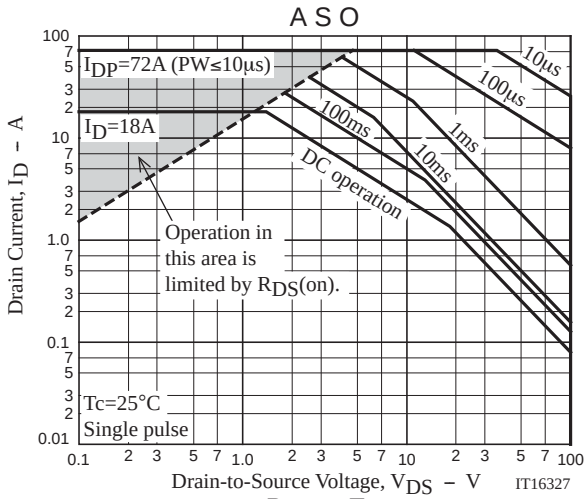

| yfs | -- ID
VDS=10V
25°C
Tc= –25°C
75°C
Forward Transfer Admittance, | yfs | – S
Drain Current, ID – A
IT16322

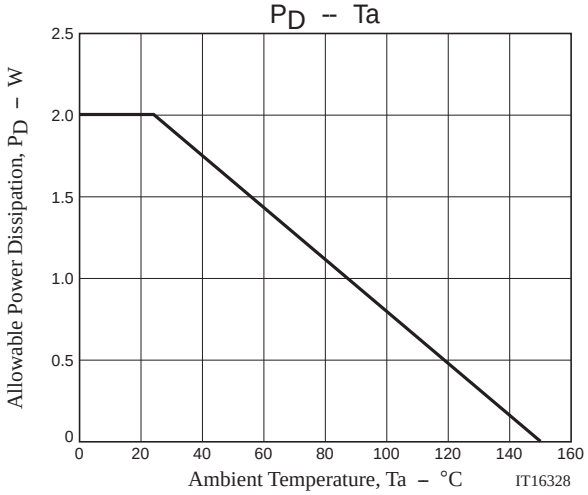

IS -- VSD
VGS=0V
Single pulse
Tc=75°C
25°C
–25°C
Source Current, IS – A
Diode Forward Voltage, VSD – V
IT16323

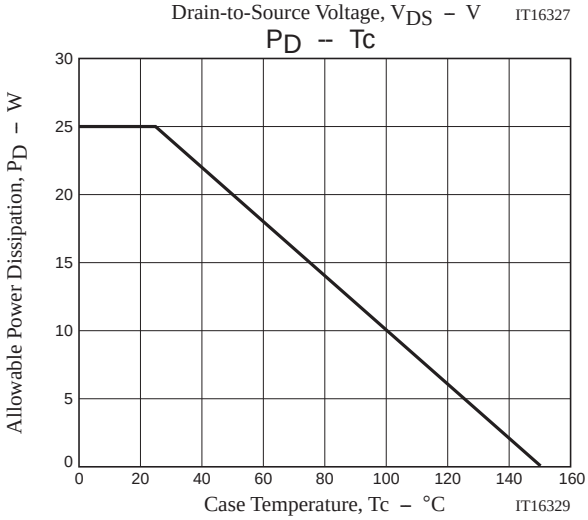

SW Time -- ID
VDD=60V
VGS=10V
tf
td(off)
td(on)
tr
Switching Time, SW Time – ns
Drain Current, ID – A
IT16324

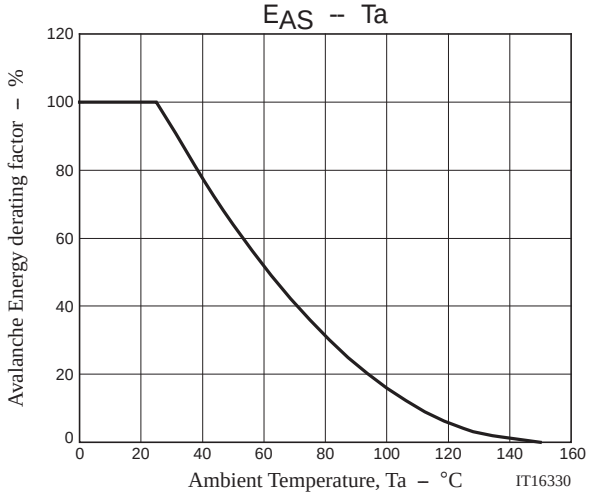

Ciss, Coss, Crss -- VDS
Ciss
f=1MHz
Coss
Crss
Ciss, Coss, Crss – pF
Drain-to-Source Voltage, VDS – V
IT16325


VGS – Qg
VDS=60V
ID=18A
Gate-to-Source Voltage, VGS – V
Total Gate Charge, Qg – nC
IT16326


A S O
IDP=72A (PW≤10μs)
ID=18A
10μs
100μs
1ms
10ms
100ms
DC operation
Operation in this area is limited by RDS(on).
Tc=25°C
Single pulse
Drain Current, ID – A
Drain-to-Source Voltage, VDS – V
IT16327


PD – Ta
Allowable Power Dissipation, PD – W
Ambient Temperature, Ta – °C
IT16328


PD – Tc
Allowable Power Dissipation, PD – W
Case Temperature, Tc – °C
IT16329


EAS – Ta
Avalanche Energy derating factor – %
Ambient Temperature, Ta – °C
IT16330

Note on usage : Since the BMS4003 is a MOSFET product, please avoid using this device in the vicinity of highly charged objects.

This catalog provides information as of February, 2011. Specifications and information herein are subject to change without notice.