Ordering number : ENA1908

SANYO Semiconductors

DATA SHEET

P-Channel Silicon MOSFET

BMS3004 — General-Purpose Switching Device Applications

Features

- ON-resistance $R_{DS}(on)1$=6.5mΩ (typ.)
- Input capacitance Ciss=13400pF (typ.)
- 4V drive

Specifications

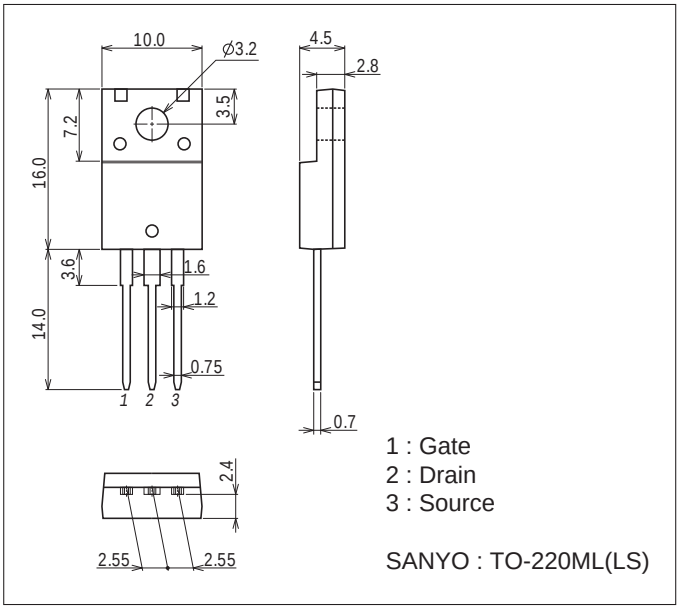
Absolute Maximum Ratings at Ta=25°C

Parameter	Symbol	Conditions	Ratings	Unit
Drain-to-Source Voltage	V_{DSS}		−75	V
Gate-to-Source Voltage	V_{GSS}		±20	V
Drain Current (DC)	I_D		−68	A
Drain Current (Pulse)	I_{DP}	PW≤10μs, duty cycle≤1%	−272	A
Allowable Power Dissipation	P_D		2.0	W
		Tc=25°C	40	W
Channel Temperature	Tch		150	°C
Storage Temperature	Tstg		−55 to +150	°C
Avalanche Energy (Single Pulse) *1	E_{AS}		380	mJ
Avalanche Current *2	I_{AV}		−54	A

Note :*1 V_{DD}=−48V, L=100μH, I_{AV}=−54A (Fig.1)
*2 L≤100μH, Single pulse

Package Dimensions

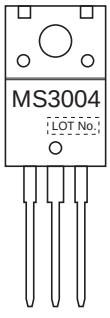
unit : mm (typ)
7525-002



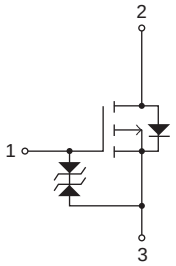
Product & Package Information

- 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	−75			V
Zero-Gate Voltage Drain Current	I_{DSS}	V_{DS}=−75V, V_{GS}=0V			−10	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
Forward Transfer Admittance	| yfs |	V_{DS}=−10V, I_D=−34A		120		S
Static Drain-to-Source On-State Resistance	R_{DS}(on)1	I_D=−34A, V_{GS}=−10V		6.5	8.5	mΩ
	R_{DS}(on)2	I_D=−34A, V_{GS}=−4V		8.3	11.4	mΩ
Input Capacitance	Ciss	V_{DS}=−20V, f=1MHz		13400		pF
Output Capacitance	Coss			1000		pF
Reverse Transfer Capacitance	Crss			740		pF
Turn-ON Delay Time	t_d(on)	See Fig.2		70		ns
Rise Time	t_r			245		ns
Turn-OFF Delay Time	t_d(off)			1400		ns
Fall Time	t_f			650		ns
Total Gate Charge	Qg	V_{DS}=−48V, V_{GS}=−10V, I_D=−68A		300		nC
Gate-to-Source Charge	Qgs			30		nC
Gate-to-Drain “Miller” Charge	Qgd			70		nC
Diode Forward Voltage	V_{SD}	I_S=−68A, V_{GS}=0V		−0.9	−1.5	V
Reverse Recovery Time	t_{rr}	See Fig.3		146		ns
Reverse Recovery Charge	Q_{rr}	I_S=−68A, V_{GS}=0V, di/dt=−100A/μs		470		nC

Fig.1 Avalanche Resistance Test Circuit

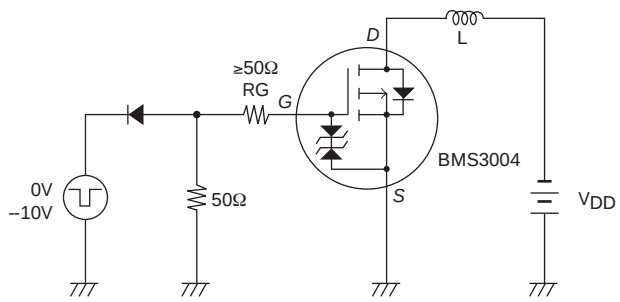


Fig.2 Switching Time Test Circuit

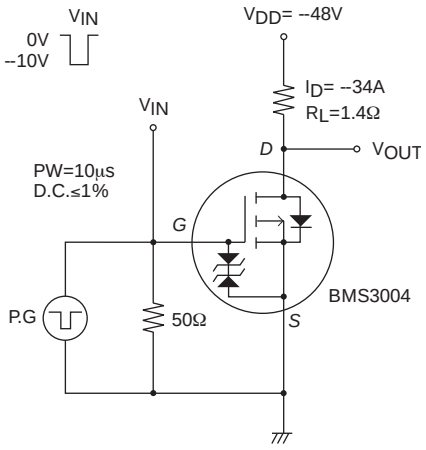
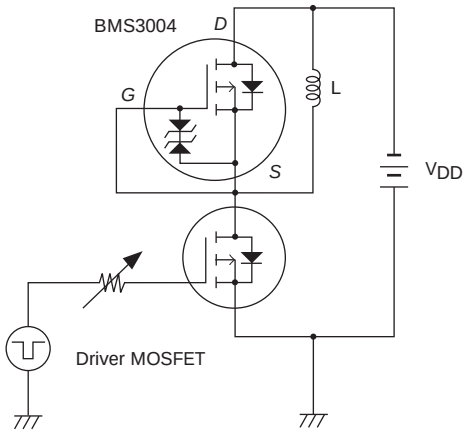
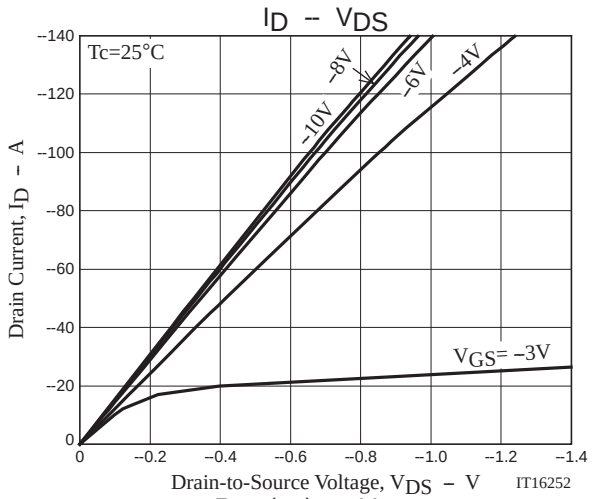
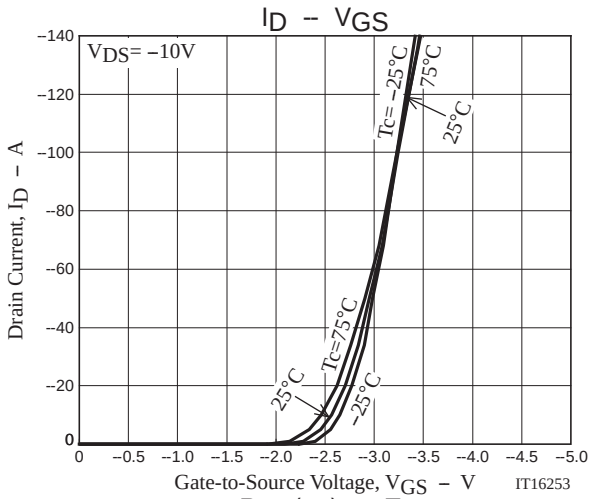
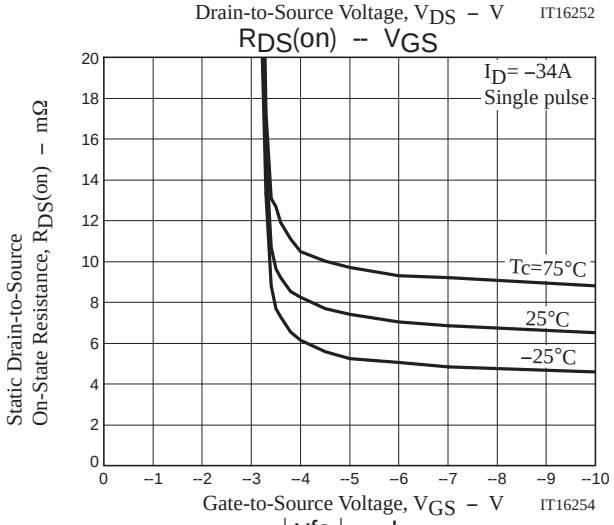


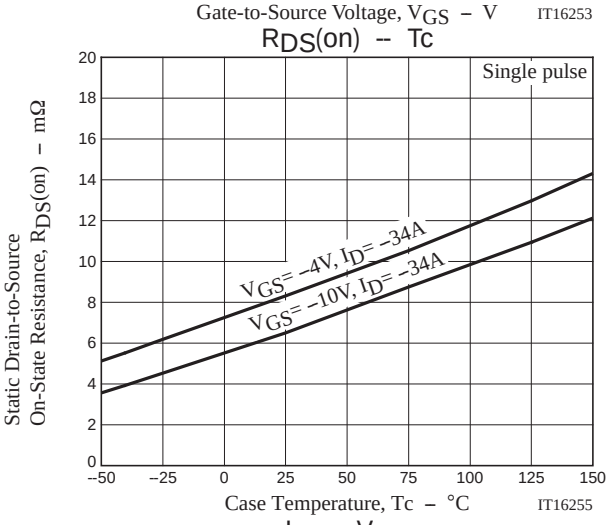
Fig.3 Reverse Recovery Time Test Circuit

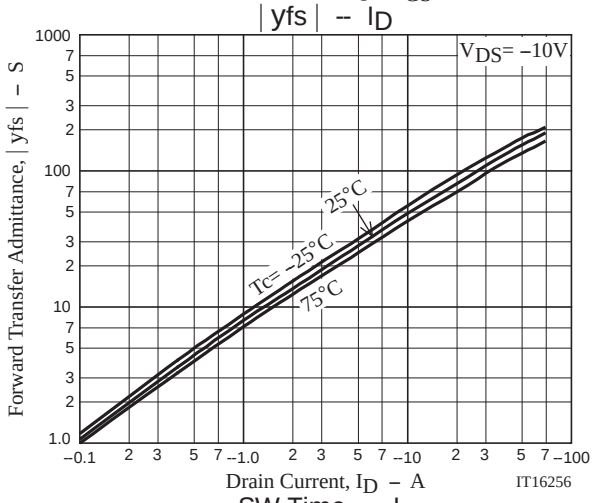


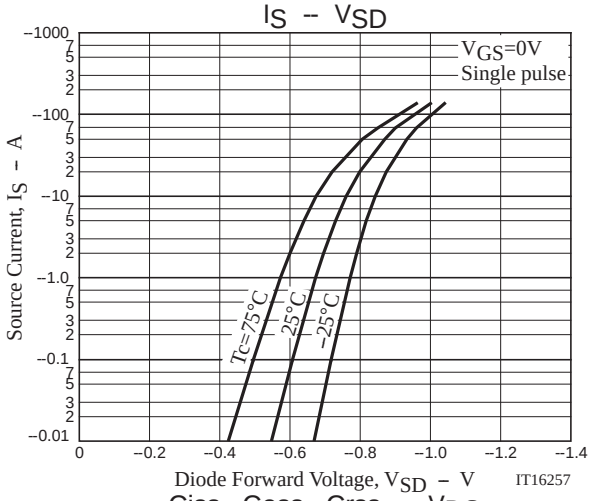

ID -- VDS
Tc=25°C
–10V
–8V
–6V
–4V
VGS= –3V
Drain Current, ID – A
Drain-to-Source Voltage, VDS – V
IT16252

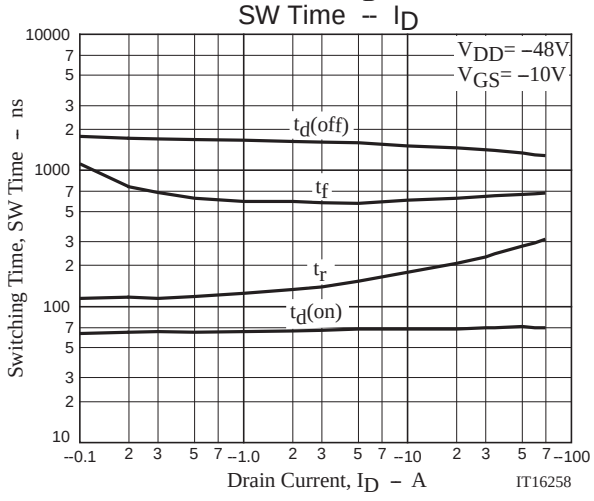

ID -- VGS
VDS= –10V
Tc= –25°C
75°C
25°C
Tc=75°C
25°C
–25°C
Drain Current, ID – A
Gate-to-Source Voltage, VGS – V
IT16253

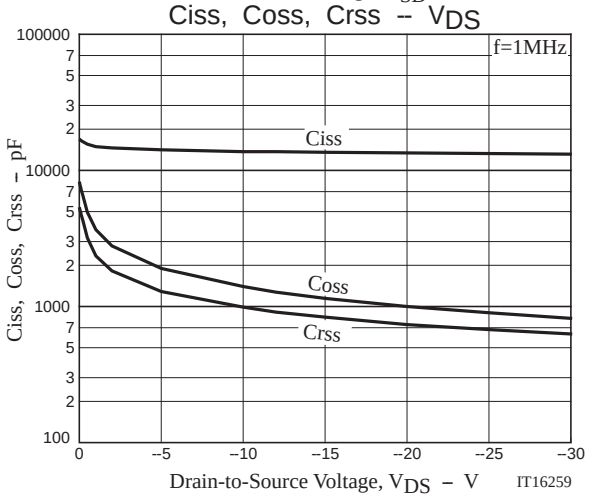

RDS(on) -- VGS
ID= –34A
Single pulse
Tc=75°C
25°C
–25°C
Static Drain-to-Source On-State Resistance, RDS(on) – mΩ
Gate-to-Source Voltage, VGS – V
IT16254

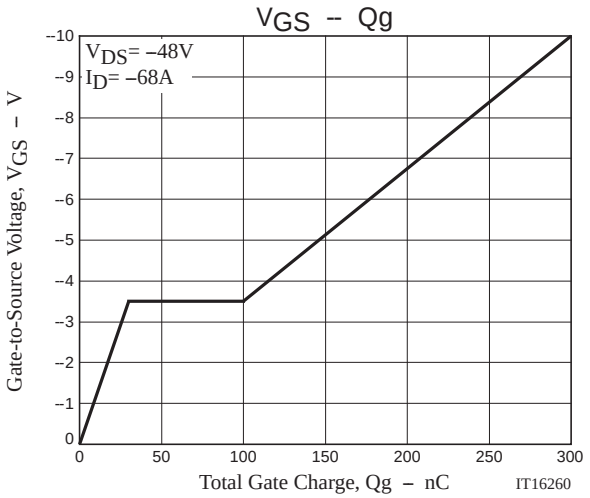

RDS(on) -- Tc
Single pulse
VGS= –4V, ID= –34A
VGS= –10V, ID= –34A
Static Drain-to-Source On-State Resistance, RDS(on) – mΩ
Case Temperature, Tc – °C
IT16255

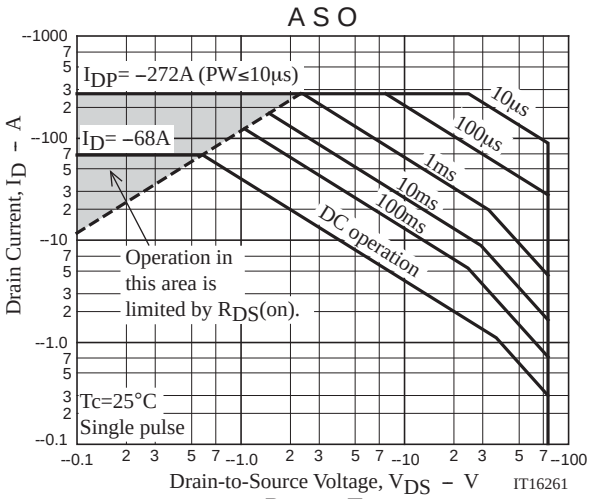

| yfs | -- ID
VDS= –10V
25°C
Tc= –25°C
75°C
Forward Transfer Admittance, | yfs | – S
Drain Current, ID – A
IT16256

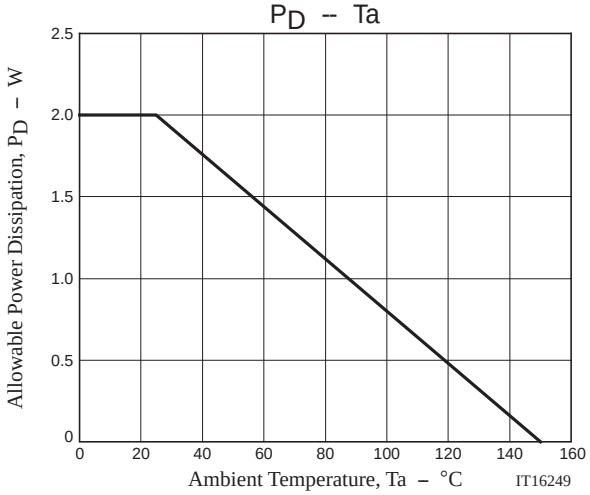

IS -- VSD
VGS=0V
Single pulse
Tc=75°C
25°C
–25°C
Source Current, IS – A
Diode Forward Voltage, VSD – V
IT16257

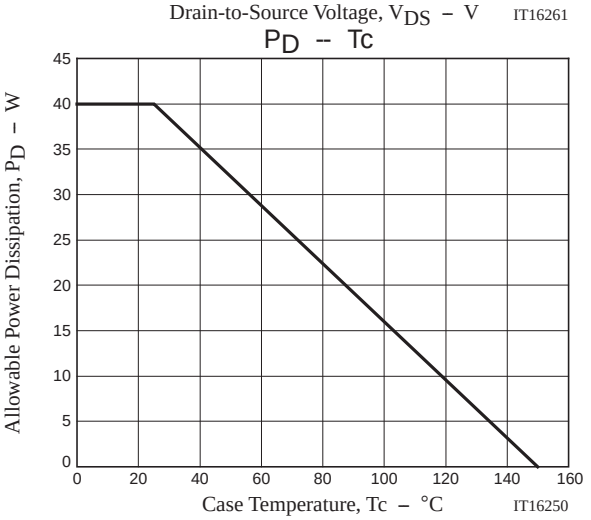

SW Time -- ID
VDD= –48V
VGS= –10V
td(off)
tf
tr
td(on)
Switching Time, SW Time – ns
Drain Current, ID – A
IT16258

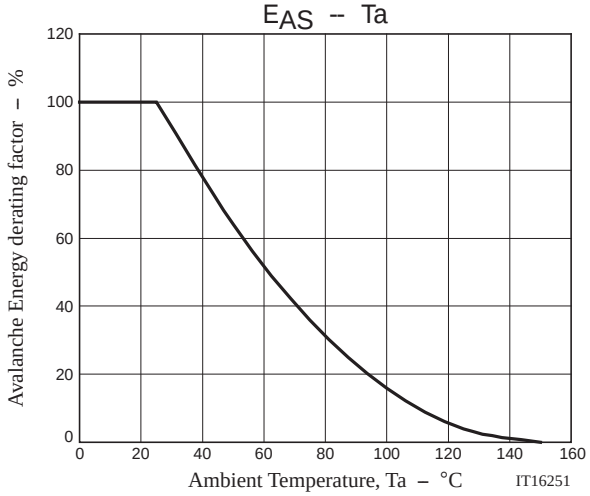

Ciss, Coss, Crss -- VDS
f=1MHz
Ciss
Coss
Crss
Ciss, Coss, Crss – pF
Drain-to-Source Voltage, VDS – V
IT16259


VGS – Qg
VDS= –48V
ID= –68A
Gate-to-Source Voltage, VGS – V
Total Gate Charge, Qg – nC
IT16260


A S O
IDP= –272A (PW≤10μs)
ID= –68A
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
IT16261


PD – Ta
Allowable Power Dissipation, PD – W
Ambient Temperature, Ta – °C
IT16249


PD – Tc
Allowable Power Dissipation, PD – W
Case Temperature, Tc – °C
IT16250


EAS – Ta
Avalanche Energy derating factor – %
Ambient Temperature, Ta – °C
IT16251

Note on usage : Since the BMS3004 is a MOSFET product, please avoid using this device in the vicinity of highly charged objects.

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