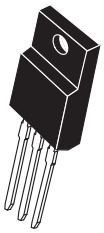
Ordering number : ENA1908B

BMS3004

P-Channel Power MOSFET
−75V, −68A, 8.5mΩ, TO-220F-3SG

ON Semiconductor®

http://onsemi.com



TO-220F-3SG

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

Stresses exceeding Maximum Ratings may damage the device. Maximum Ratings are stress ratings only. Functional operation above the Recommended Operating Conditions is not implied. Extended exposure to stresses above the Recommended Operating Conditions may affect device reliability.

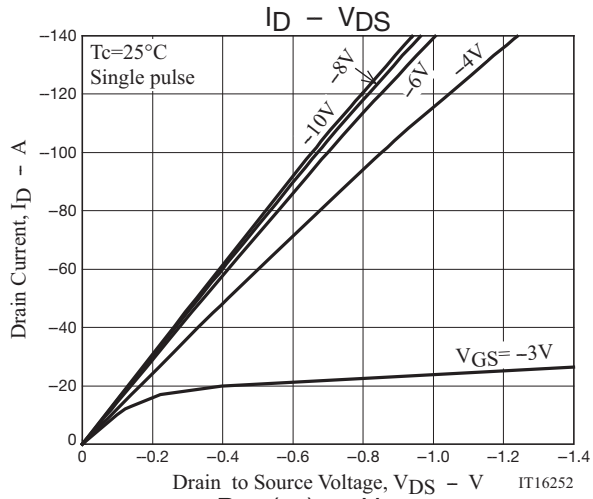
Electrical Characteristics at Ta=25°C

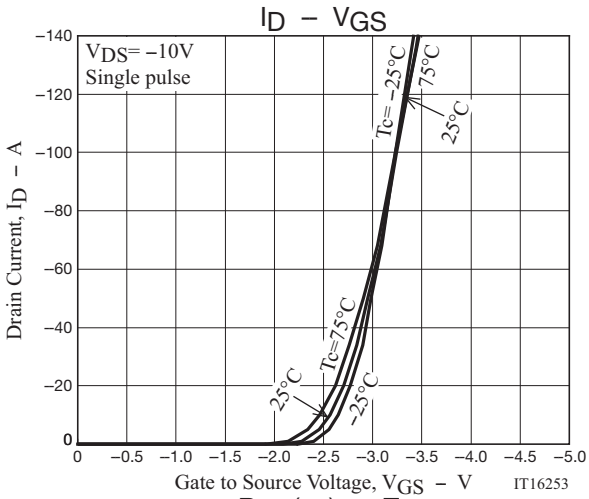
Parameter	Symbol	Conditions	Ratings			Unit
			min	typ	max	
Drain to Source Breakdown Voltage	$V_{(BR)DSS}$	I_D=−1mA, V_{GS}=0V	−75			V
Zero-Gate Voltage Drain Current	I_{DSS}	V_{DS}=−75V, V_{GS}=0V			−10	μA
Gate to Source Leakage Current	I_{GSS}	V_{GS}=±16V, V_{DS}=0V			±10	μA
Cutoff Voltage	$V_{GS}(off)$	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

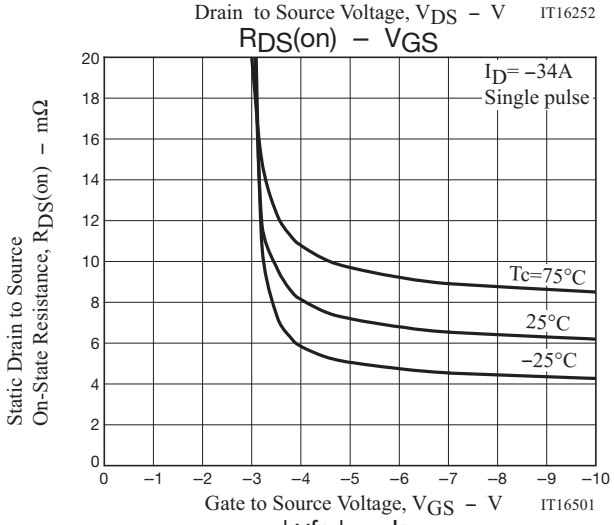
ORDERING INFORMATION

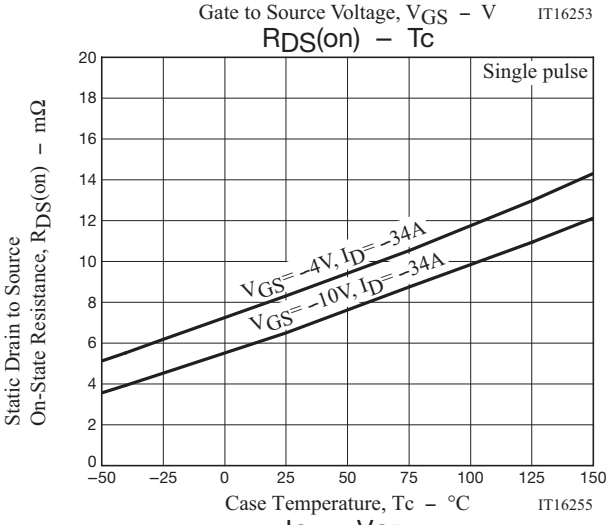
See detailed ordering and shipping information on page 4 of this data sheet.

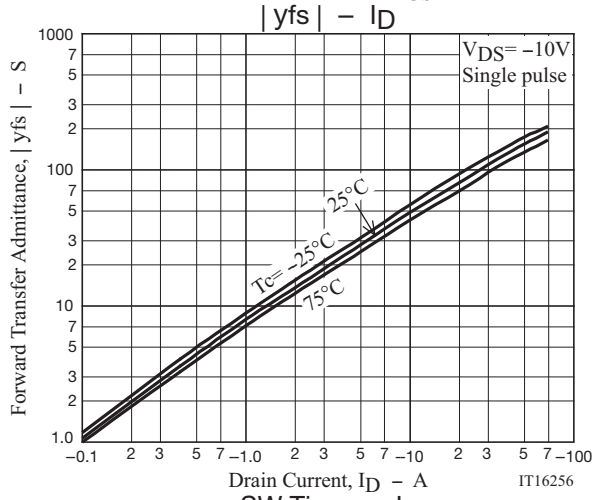
Semiconductor Components Industries, LLC, 2013
November, 2013

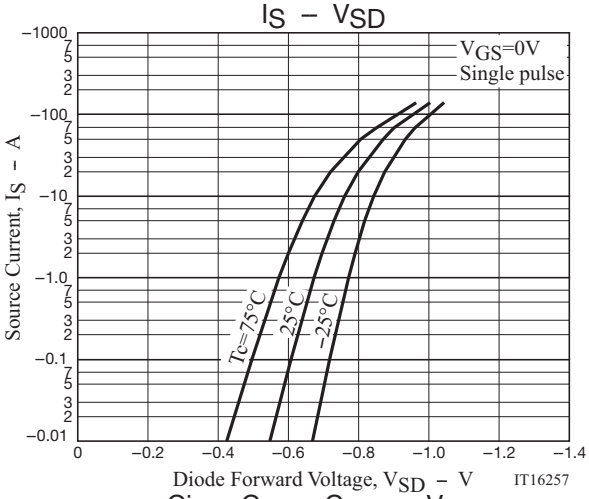

ID – VDS
Tc=25°C
Single pulse
–8V
–10V
–6V
–4V
VGS= –3V
Drain Current, ID – A
Drain to Source Voltage, VDS – V
IT16252

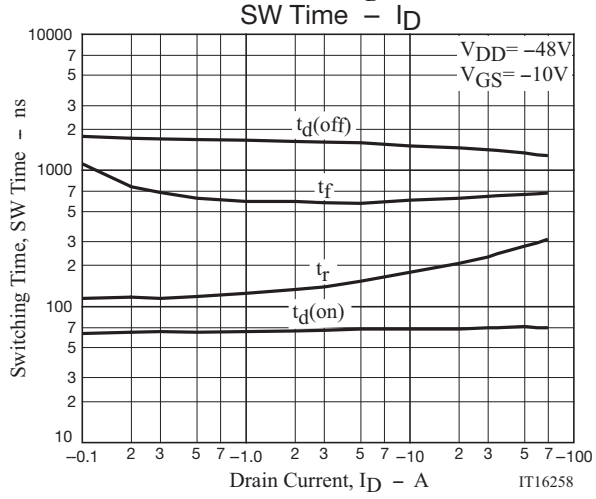

ID – VGS
VDS= –10V
Single pulse
Tc= –25°C
75°C
25°C
Tc=75°C
25°C
–25°C
Drain Current, ID – A
Gate to Source Voltage, VGS – V
IT16253

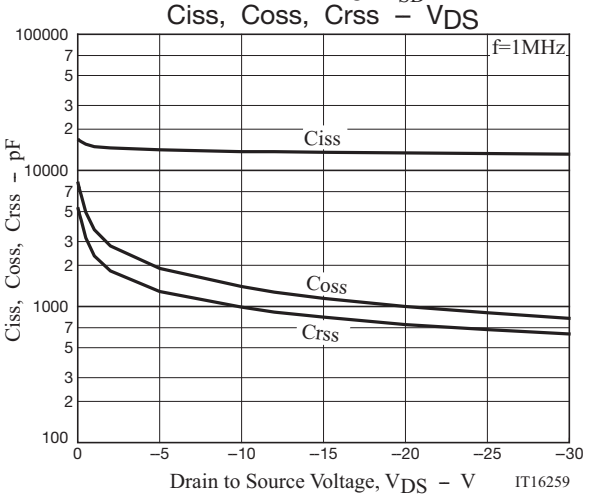

RDS(on) – VGS
ID= –34A
Single pulse
Tc=75°C
25°C
–25°C
Static Drain to Source
On-State Resistance, RDS(on) – mΩ
Gate to Source Voltage, VGS – V
IT16501

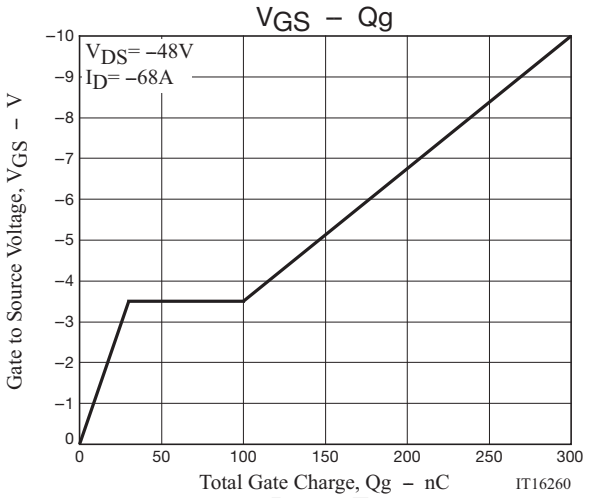

RDS(on) – Tc
Single pulse
VGS= –4V, ID= –34A
VGS= –10V, ID= –34A
Static Drain to Source
On-State Resistance, RDS(on) – mΩ
Case Temperature, Tc – °C
IT16255

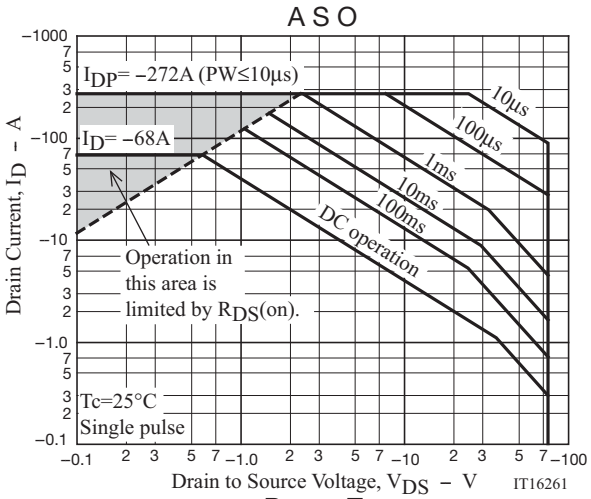

| yfs | – ID
VDS= –10V
Single pulse
25°C
Tc= –25°C
75°C
Forward Transfer Admittance, | yfs | – S
Drain Current, ID – A
IT16256

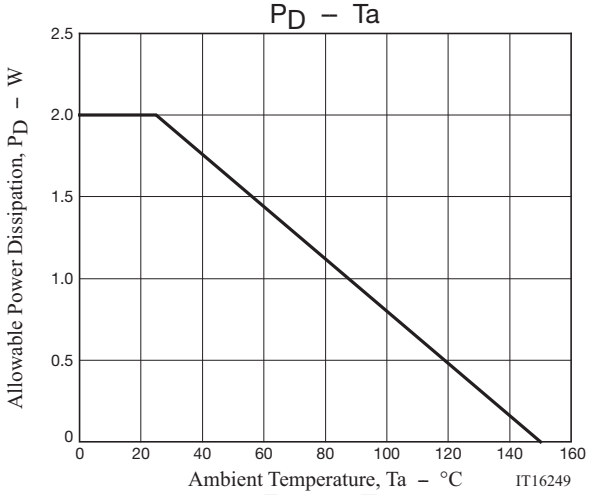

IS – VSD
VGS=0V
Single pulse
Tc=75°C
25°C
–25°C
Source Current, IS – A
Diode Forward Voltage, VSD – V
IT16257

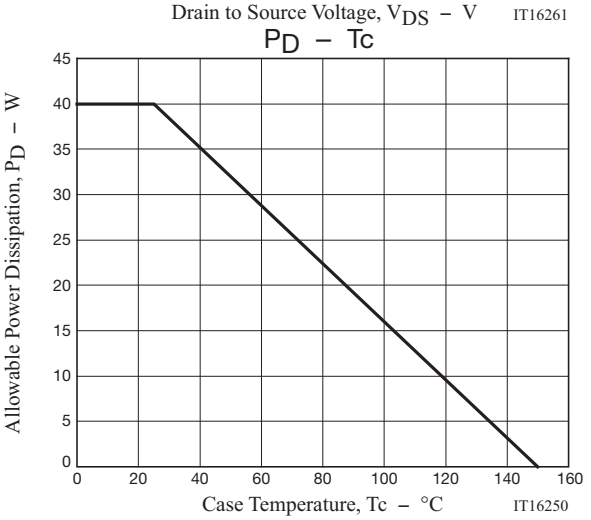

SW Time – ID
VDD= –48V
VGS= –10V
td(off)
tf
tr
td(on)
Switching Time, SW Time – ns
Drain Current, ID – A
IT16258

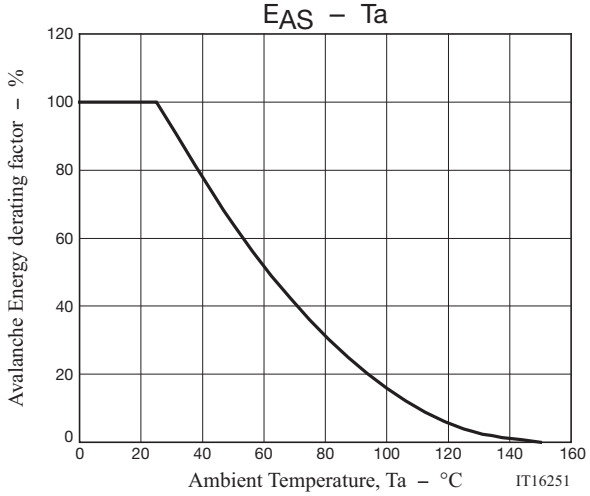

Ciss, Coss, Crss – VDS
f=1MHz
Ciss
Coss
Crss
Ciss, Coss, Crss – pF
Drain to Source Voltage, VDS – V
IT16259


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

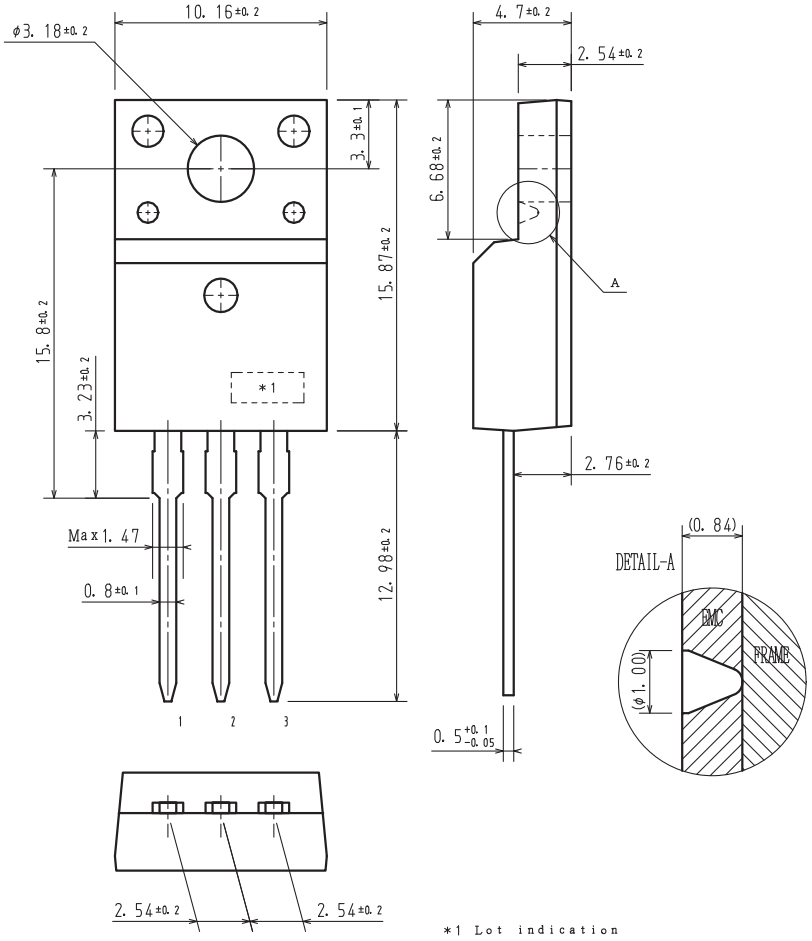

EAS – Ta
Avalanche Energy derating factor – %
Ambient Temperature, Ta – °C
IT16251

Package Dimensions

BMS3004-1E

TO-220F-3SG
CASE
ISSUE O
Unit : mm

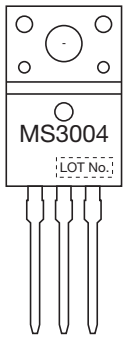
1: Gate
2: Drain
3: Source



Ordering & Package Information

Device	Package	Shipping	memo
BMS3004-1E	TO-220F-3SG SC-67	50 pcs./tube	Pb-Free

Marking



Electrical Connection

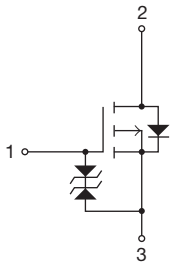


Fig.1 Unclamped Inductive Switching Test Circuit

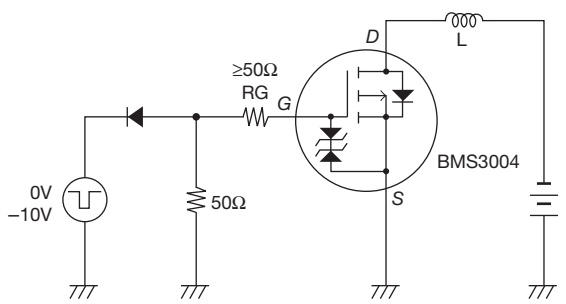


Fig.2 Switching Time Test Circuit

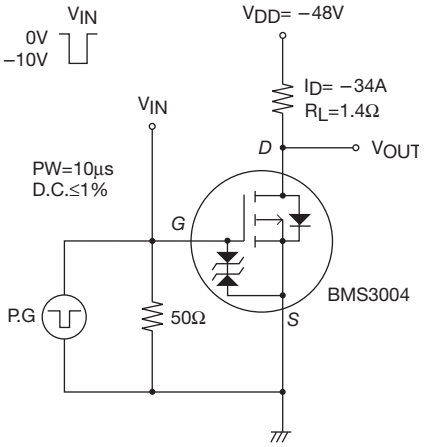
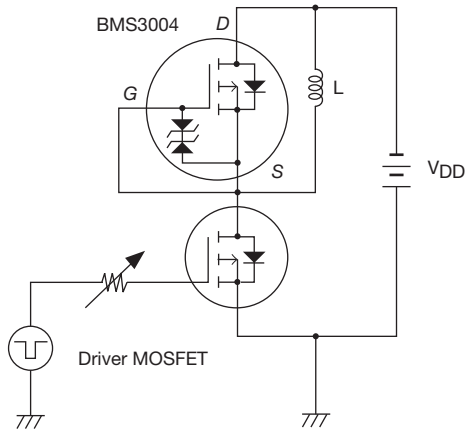


Fig.3 Reverse Recovery Time Test Circuit



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

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