Ordering number : ENA1820

BMS4007

N-Channel Power MOSFET
75V, 60A, 7.8mΩ, TO-220ML(LS)

ON Semiconductor®
http://onsemi.com

Features

- ON-resistance $R_{DS}(on)$=6mΩ (typ.)
- Input capacitance Ciss=9700pF (typ.)
- 10V drive

Specifications

Absolute Maximum Ratings at Ta=25°C

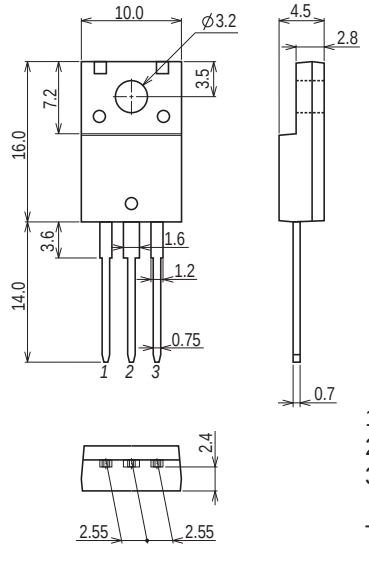
Parameter	Symbol	Conditions	Ratings	Unit
Drain-to-Source Voltage	V_{DSS}		75	V
Gate-to-Source Voltage	V_{GSS}		±20	V
Drain Current (DC)	I_D		60	A
Drain Current (Pulse)	I_{DP}	PW≤10μs, duty cycle≤1%	240	A
Allowable Power Dissipation	P_D		2.0	W
		Tc=25°C	30	W
Channel Temperature	Tch		150	°C
Storage Temperature	Tstg		−55 to +150	°C
Avalanche Energy (Single Pulse) *1	E_{AS}		299	mJ
Avalanche Current *2	I_{AV}		48	A

Note :*1 V_{DD}=48V, L=100μH, I_{AV}=48A (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.

Package Dimensions

unit : mm (typ)
7525-002



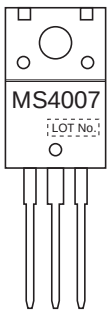
1 : Gate
2 : Drain
3 : Source

TO-220ML(LS)

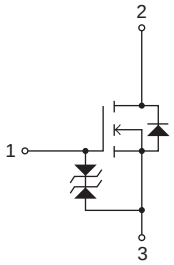
Product & Package Information

- 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	2		4	V
Forward Transfer Admittance	| yfs |	V_{DS}=10V, I_D=30A		110		S
Static Drain-to-Source On-State Resistance	R_{DS}(on)	I_D=30A, V_{GS}=10V		6	7.8	mΩ
Input Capacitance	Ciss	V_{DS}=20V, f=1MHz		9700		pF
Output Capacitance	Coss			540		pF
Reverse Transfer Capacitance	Crss			360		pF
Turn-ON Delay Time	t_d(on)	See Fig.2		100		ns
Rise Time	t_r			180		ns
Turn-OFF Delay Time	t_d(off)			460		ns
Fall Time	t_f			160		ns
Total Gate Charge	Qg	V_{DS}=48V, V_{GS}=10V, I_D=60A		160		nC
Gate-to-Source Charge	Qgs			40		nC
Gate-to-Drain “Miller” Charge	Qgd			40		nC
Diode Forward Voltage	V_{SD}	I_S=60A, V_{GS}=0V		0.9	1.2	V
Reverse Recovery Time	t_{rr}	See Fig.3		70		ns
Reverse Recovery Charge	Q_{rr}	I_S=60A, V_{GS}=0V, di/dt=100A/μs		183		nC

Fig.1 Avalanche Resistance Test Circuit

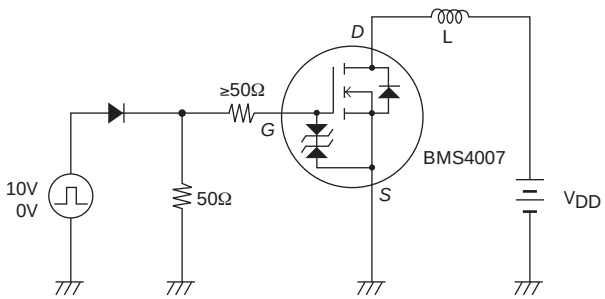


Fig.2 Switching Time Test Circuit

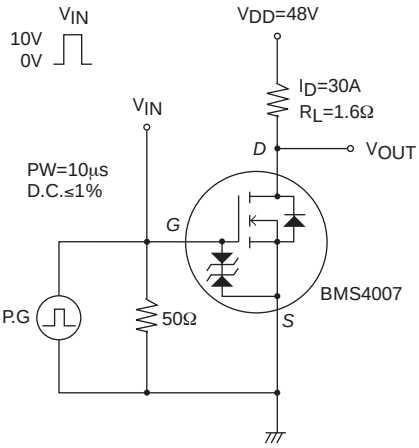
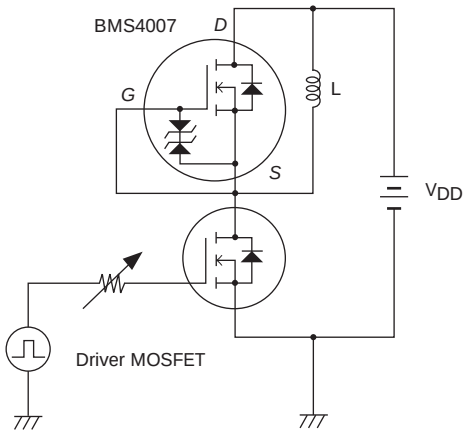
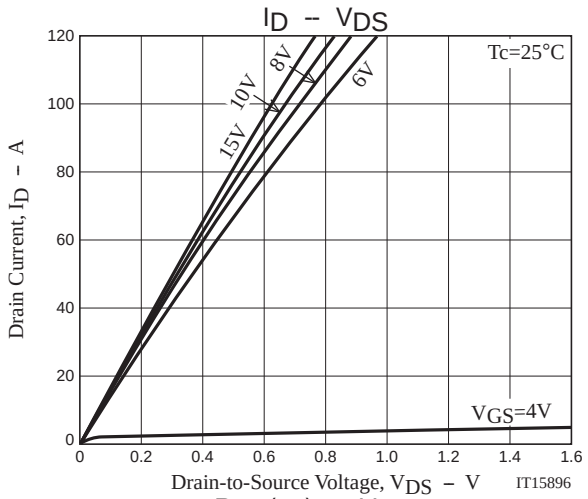
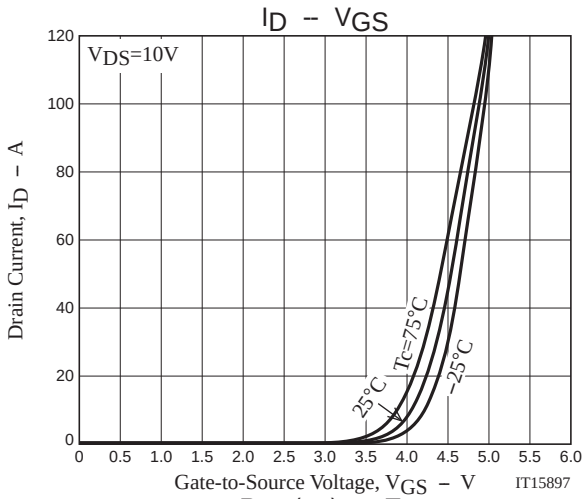
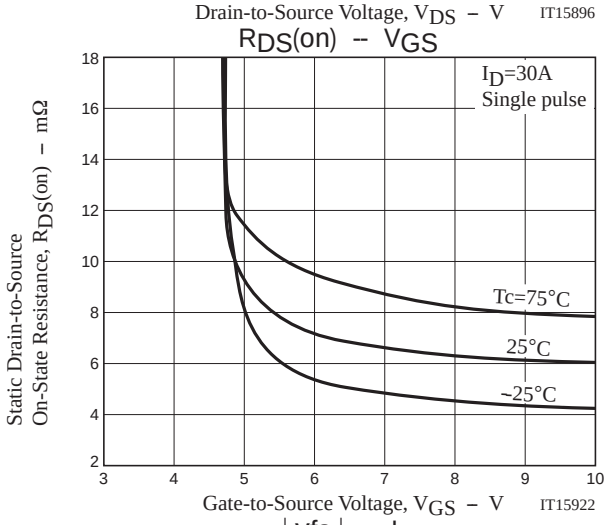


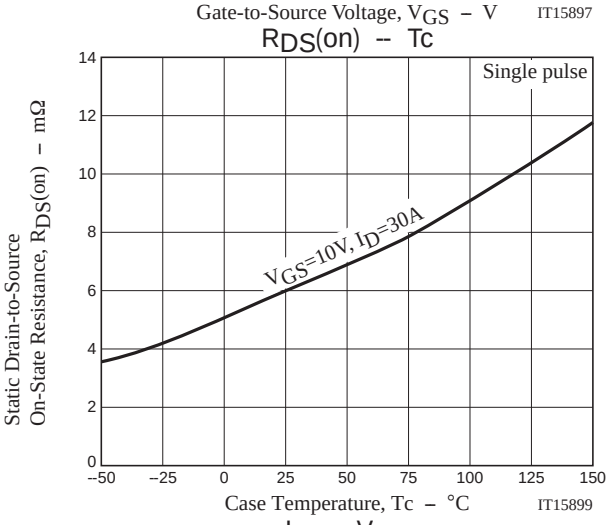
Fig.3 Reverse Recovery Time Test Circuit

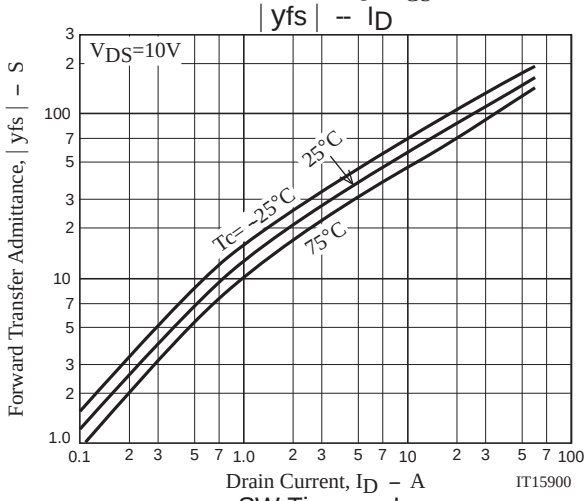


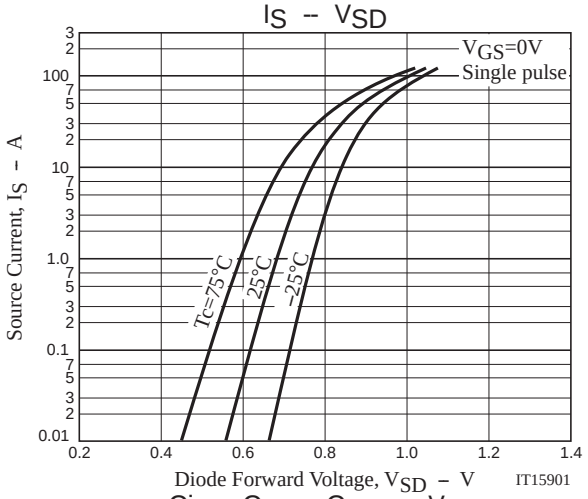

ID -- VDS
Tc=25°C
10V
8V
6V
15V
VGS=4V
Drain Current, ID – A
Drain-to-Source Voltage, VDS – V
IT15896

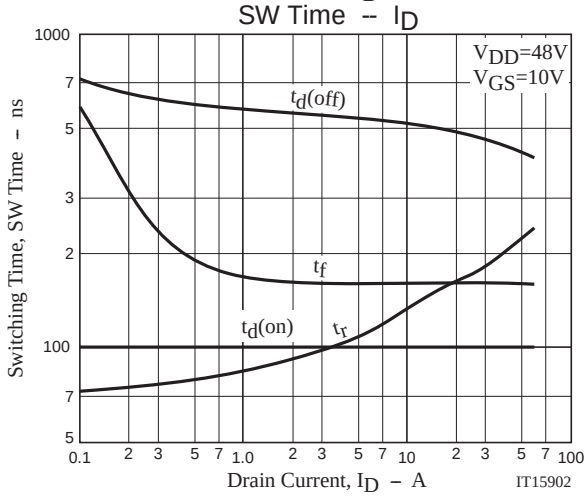

ID -- VGS
VDS=10V
Tc=75°C
25°C
–25°C
Drain Current, ID – A
Gate-to-Source Voltage, VGS – V
IT15897

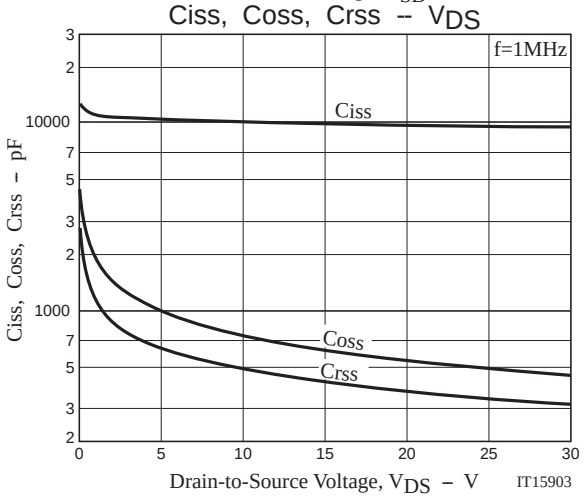

RDS(on) -- VGS
ID=30A
Single pulse
Tc=75°C
25°C
–25°C
Static Drain-to-Source On-State Resistance, RDS(on) – mΩ
Gate-to-Source Voltage, VGS – V
IT15922

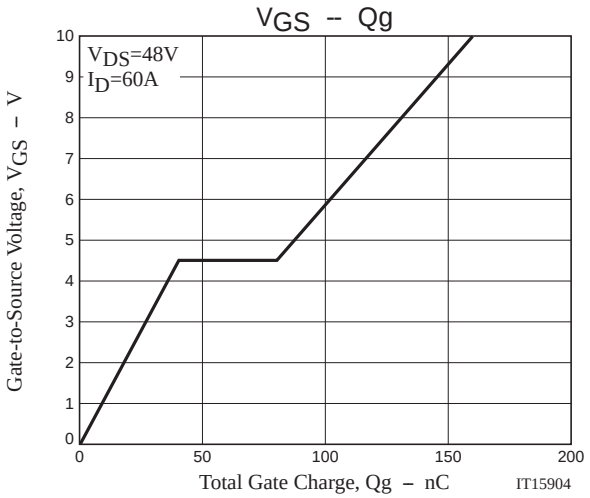

RDS(on) -- Tc
Single pulse
VGS=10V, ID=30A
Static Drain-to-Source On-State Resistance, RDS(on) – mΩ
Case Temperature, Tc – °C
IT15899

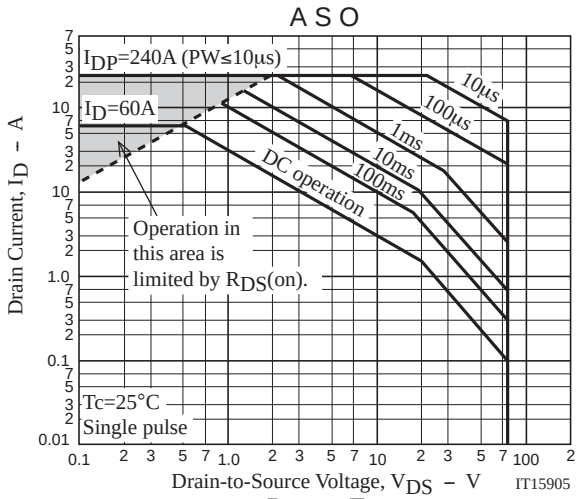

| yfs | -- ID
VDS=10V
25°C
Tc= –25°C
75°C
Forward Transfer Admittance, | yfs | – S
Drain Current, ID – A
IT15900

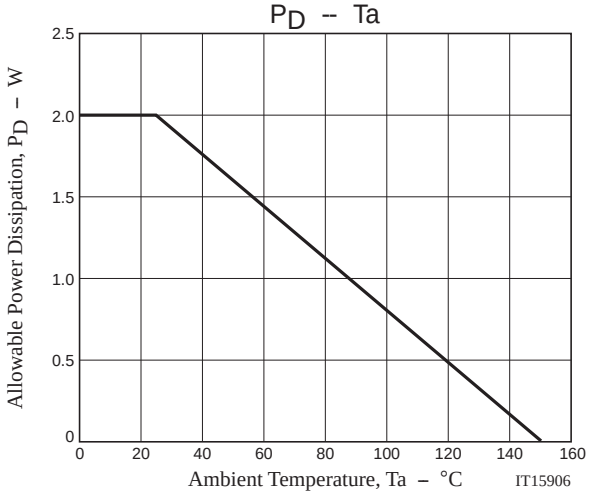

IS -- VSD
VGS=0V
Single pulse
Tc=75°C
25°C
–25°C
Source Current, IS – A
Diode Forward Voltage, VSD – V
IT15901

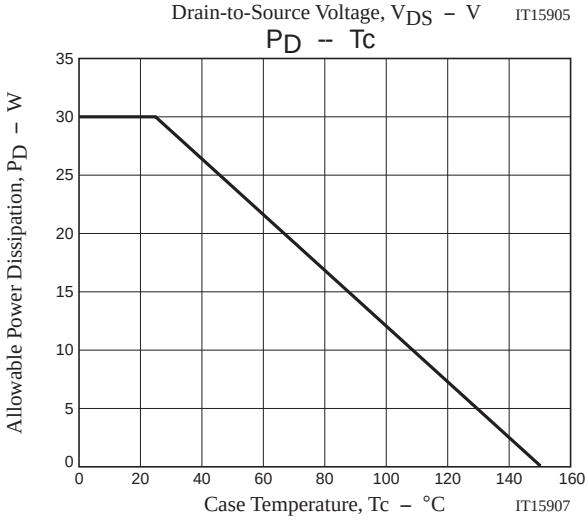

SW Time -- ID
VDD=48V
VGS=10V
td(off)
tf
td(on)
tr
Switching Time, SW Time – ns
Drain Current, ID – A
IT15902

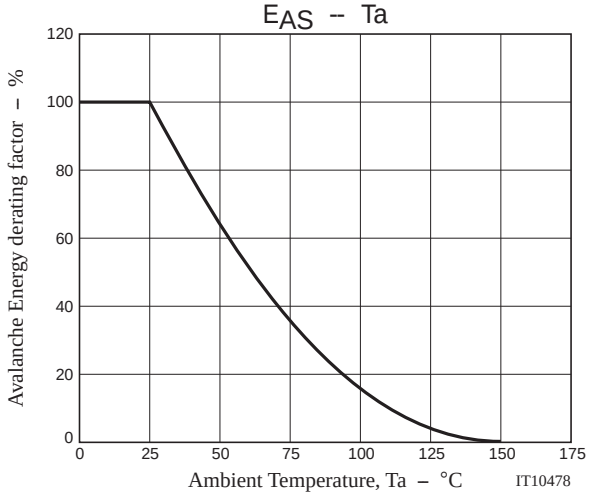

Ciss, Coss, Crss -- VDS
f=1MHz
Ciss
Coss
Crss
Ciss, Coss, Crss – pF
Drain-to-Source Voltage, VDS – V
IT15903


VGS – Qg
VDS=48V
ID=60A
Gate-to-Source Voltage, VGS – V
Total Gate Charge, Qg – nC
IT15904


A S O
IDP=240A (PW≤10μs)
ID=60A
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
IT15905


PD – Ta
Allowable Power Dissipation, PD – W
Ambient Temperature, Ta – °C
IT15906


PD – Tc
Allowable Power Dissipation, PD – W
Case Temperature, Tc – °C
IT15907


EAS – Ta
Avalanche Energy derating factor – %
Ambient Temperature, Ta – °C
IT10478

Note on usage : Since the BMS4007 is a MOSFET product, please avoid using this device in the vicinity of highly charged objects.