Ordering number : ENA1356A

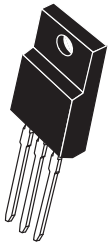
BBL4001

N-Channel Power MOSFET
60V, 74A, 6.1mΩ, TO-220F-3SG

ON Semiconductor®
http://onsemi.com

Features

- ON-resistance $R_{DS}(on)1$=4.7mΩ(typ.)
- Input capacitance Ciss=6,900pF(typ.)
- 4V drive



TO-220F-3SG

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		74	A
Drain Current (Pulse)	I_{DP}	PW≤10μs, duty cycle≤1%	296	A
Allowable Power Dissipation	P_D		2.0	W
		Tc=25°C	35	W
Junction Temperature	Tj		150	°C
Storage Temperature	Tstg		−55 to +150	°C
Avalanche Energy (Single Pulse) *1	E_{AS}		370	mJ
Avalanche Current *2	I_{AV}		65	A

Note :*1 V_{DD}=30V, L=100μH, I_{AV}=65A(Fig.1)
*2 L≤100μH, Single pulse

Stresses exceeding those listed in the Maximum Ratings table may damage the device. If any of these limits are exceeded, device functionality should not be assumed, damage may occur and reliability may be affected.

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
Gate Threshold Voltage	$V_{GS}(th)$	V_{DS}=10V, I_D=1mA	1.2		2.6	V
Forward Transconductance	g_{FS}	V_{DS}=10V, I_D=37A	32	53		S
Static Drain to Source On-State Resistance	$R_{DS}(on)1$	I_D=37A, V_{GS}=10V		4.7	6.1	mΩ
	$R_{DS}(on)2$	I_D=37A, V_{GS}=4V		7.0	9.8	mΩ
Input Capacitance	Ciss	V_{DS}=20V, f=1MHz		6900		pF
Output Capacitance	Coss			740		pF
Reverse Transfer Capacitance	Crss			540		pF
Turn-ON Delay Time	$t_d(on)$	See specified Test Circuit.		48		ns
Rise Time	t_r			300		ns
Turn-OFF Delay Time	$t_d(off)$			510		ns
Fall Time	t_f			340		ns
Total Gate Charge	Qg	V_{DS}=30V, V_{GS}=10V, I_D=74A		135		nC
Gate to Source Charge	Qgs			18		nC
Gate to Drain “Miller” Charge	Qgd			32		nC
Diode Forward Voltage	V_{SD}	I_S=74A, V_{GS}=0V		1.0	1.2	V

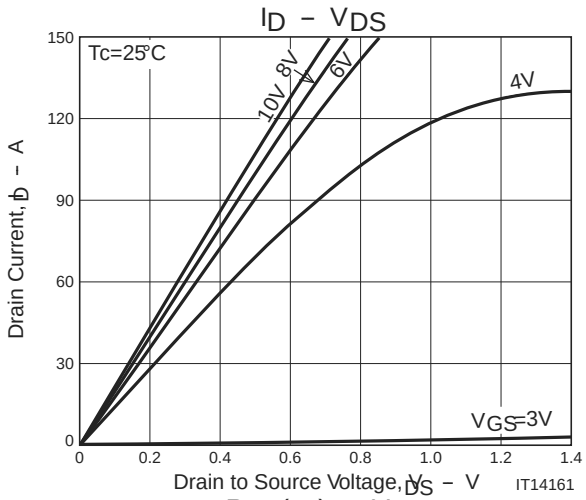
Product parametric performance is indicated in the Electrical Characteristics for the listed test conditions, unless otherwise noted. Product performance may not be indicated by the Electrical Characteristics if operated under different conditions.

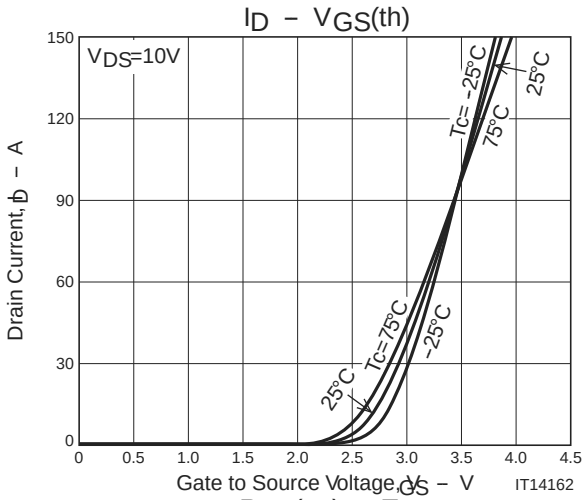
ORDERING INFORMATION

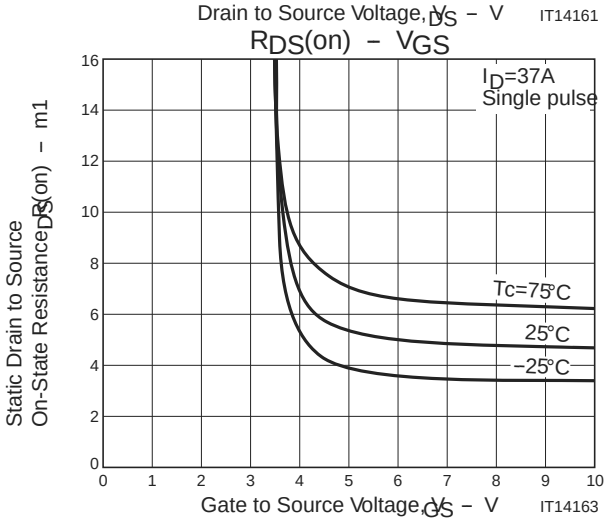
See detailed ordering and shipping information on page 4 of this data sheet.

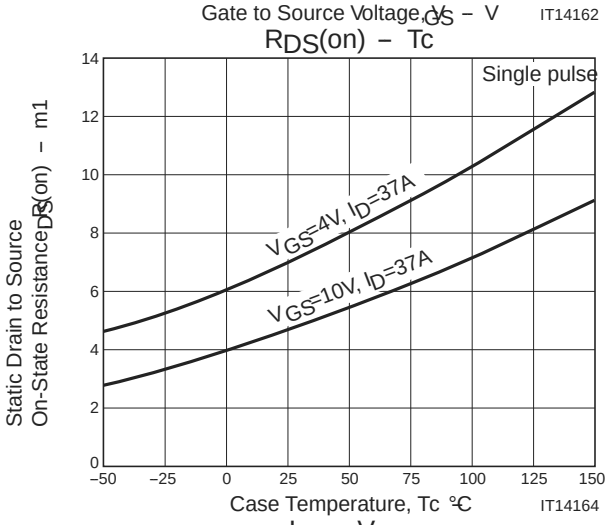
Semiconductor Components Industries, LLC, 2014
April, 2014

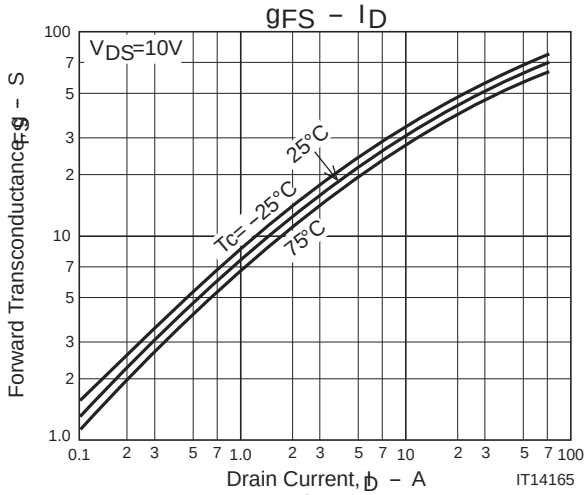
40214 TKIM TC-00003095 / N2608QA TI IM TC-00001754 No. A1356-1/5

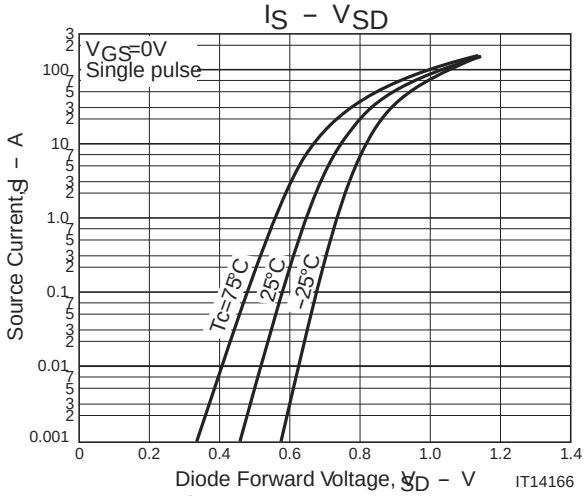

ID – VDS
Tc=25°C
10V
8V
6V
4V
VGS=3V
Drain Current, ID – A
Drain to Source Voltage, VDS – V
IT14161

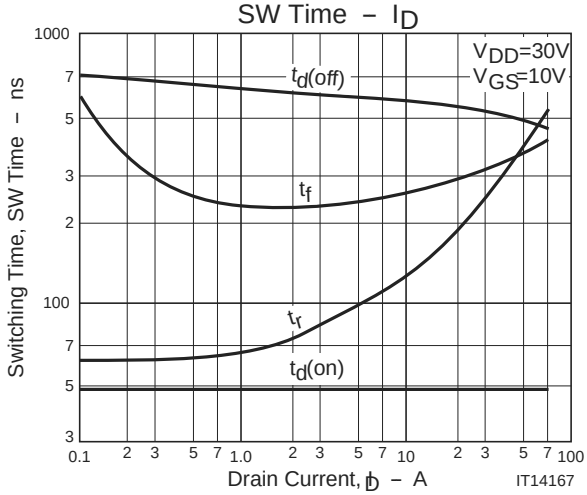

ID – VGS(th)
VDS=10V
Tc= –25°C
25°C
75°C
Drain Current, ID – A
Gate to Source Voltage, VGS – V
IT14162


RDS(on) – VGS
ID=37A
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
IT14163


RDS(on) – Tc
Single pulse
VGS=4V, ID=37A
VGS=10V, ID=37A
Static Drain to Source On-State Resistance, RDS(on) – mΩ
Case Temperature, Tc – °C
IT14164


gFS – ID
VDS=10V
25°C
Tc= –25°C
75°C
Forward Transconductance, gFS – S
Drain Current, ID – A
IT14165


IS – VSD
VGS=0V
Single pulse
Tc=75°C
25°C
–25°C
Source Current, IS – A
Diode Forward Voltage, VSD – V
IT14166


SW Time – ID
VDD=30V
VGS=10V
td(off)
tf
tr
td(on)
Switching Time, SW Time – ns
Drain Current, ID – A
IT14167

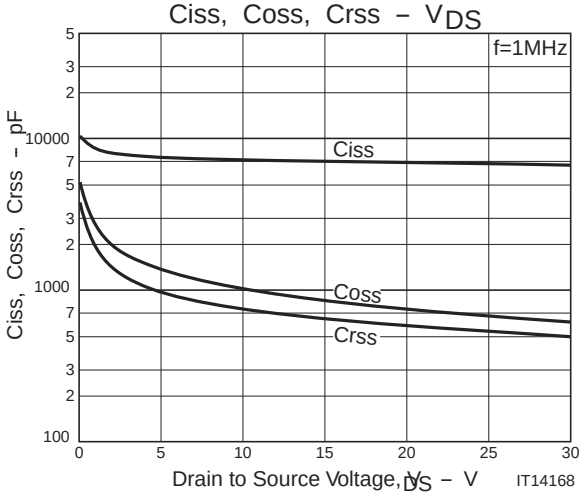

Ciss, Coss, Crss – VDS
f=1MHz
Ciss
Coss
Crss
Ciss, Coss, Crss – pF
Drain to Source Voltage, VDS – V
IT14168

Fig.1 Unclamped Inductive Switching Test Circuit

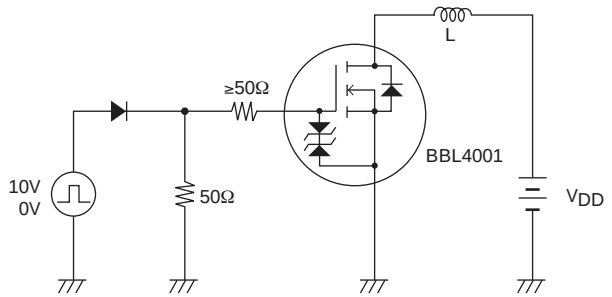
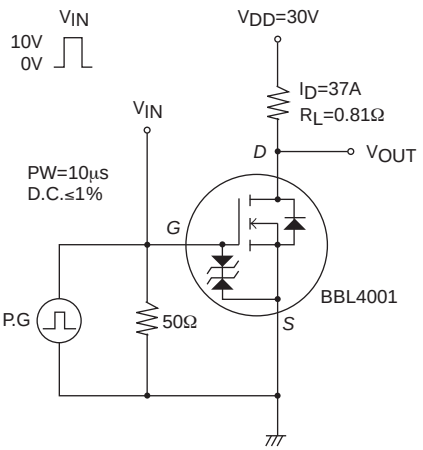


Fig.2 Switching Time Test Circuit



Note on usage : Since the BBL4001 is a MOSFET product, please avoid using this device in the vicinity of highly charged objects.

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