



# BBL4001

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

ON Semiconductor®

<http://onsemi.com>

### Features

- ON-resistance  $R_{DS(on)1}=4.7\text{m}\Omega(\text{typ.})$
- Input capacitance  $C_{iss}=6,900\text{pF}(\text{typ.})$
- 4V drive

### Specifications

#### Absolute Maximum Ratings at $T_a=25^\circ\text{C}$

Parameter	Symbol	Conditions	Ratings	Unit
Drain to Source Voltage	$V_{DSS}$		60	V
Gate to Source Voltage	$V_{GSS}$		$\pm 20$	V
Drain Current (DC)	$I_D$		74	A
Drain Current (Pulse)	$I_{DP}$	$PW \leq 10\mu\text{s}$ , duty cycle $\leq 1\%$	296	A
Allowable Power Dissipation	PD		2.0	W
		$T_c=25^\circ\text{C}$	35	W
Junction Temperature	$T_j$		150	$^\circ\text{C}$
Storage Temperature	$T_{stg}$		-55 to +150	$^\circ\text{C}$
Avalanche Energy (Single Pulse) *1	$E_{AS}$		370	mJ
Avalanche Current *2	$I_{AV}$		65	A

Note : \*1  $V_{DD}=30\text{V}$ ,  $L=100\mu\text{H}$ ,  $I_{AV}=65\text{A}(\text{Fig.1})$ \*2  $L \leq 100\mu\text{H}$ , 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.

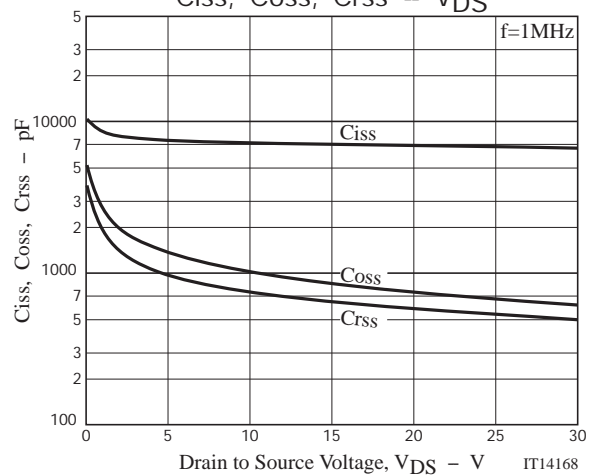
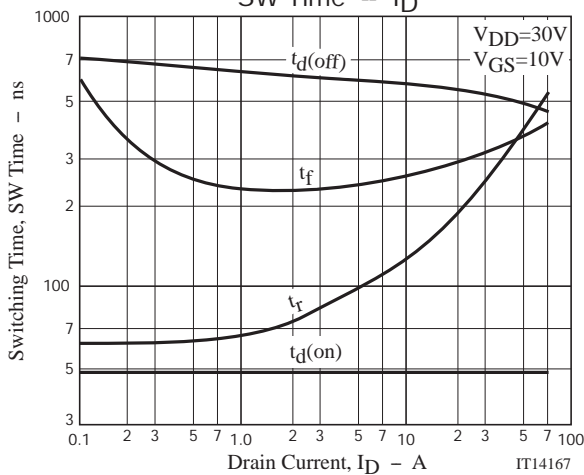
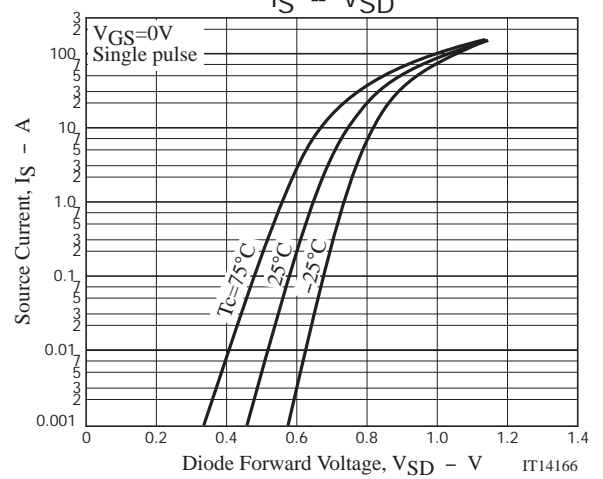
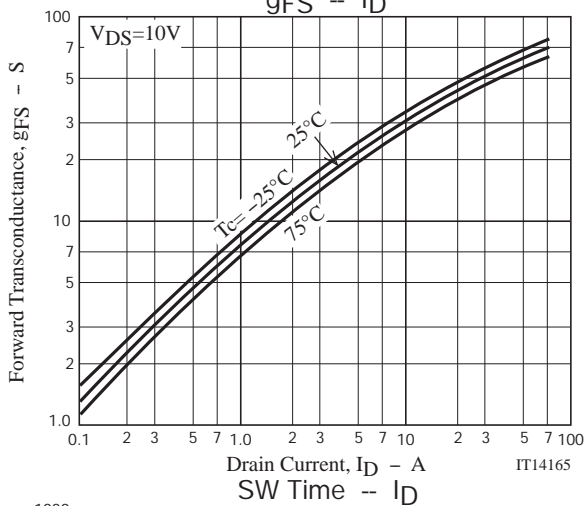
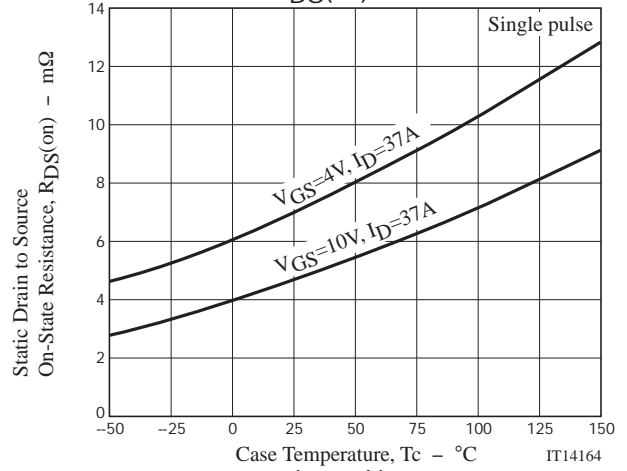
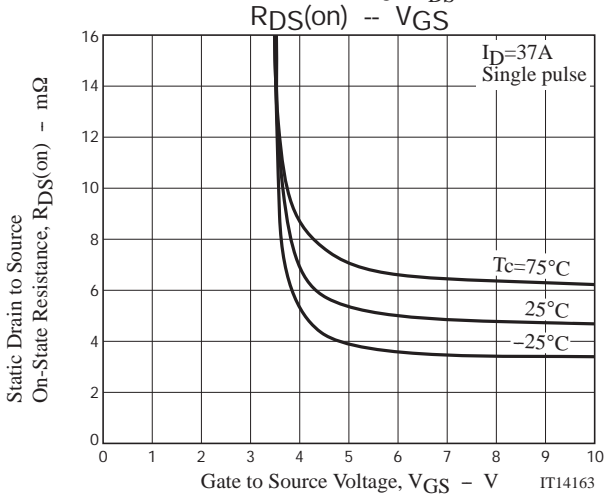
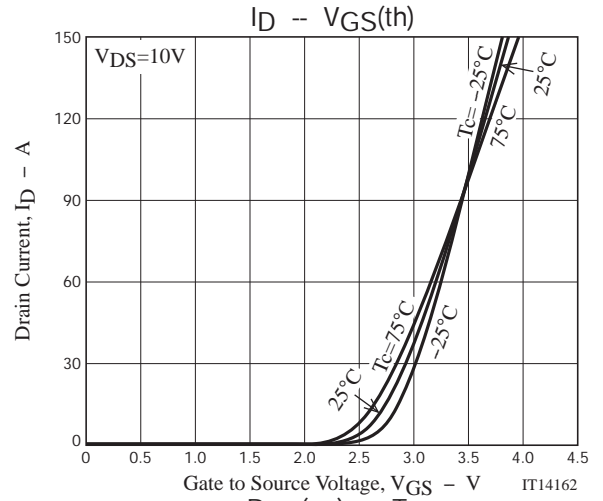
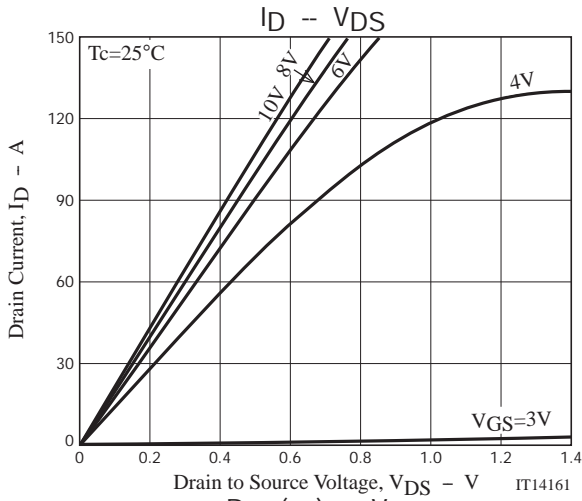
#### Electrical Characteristics at $T_a=25^\circ\text{C}$

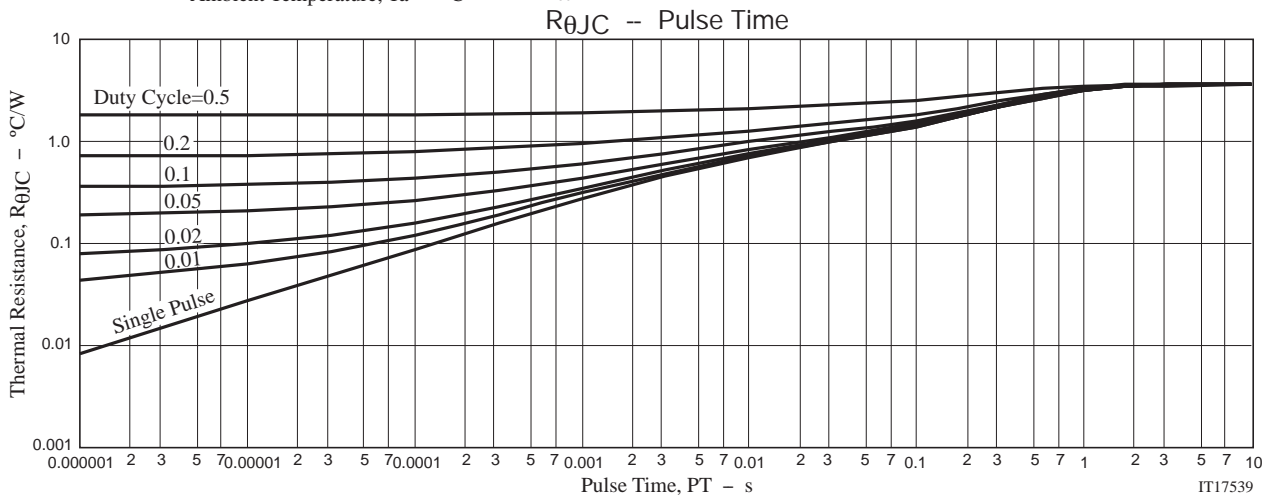
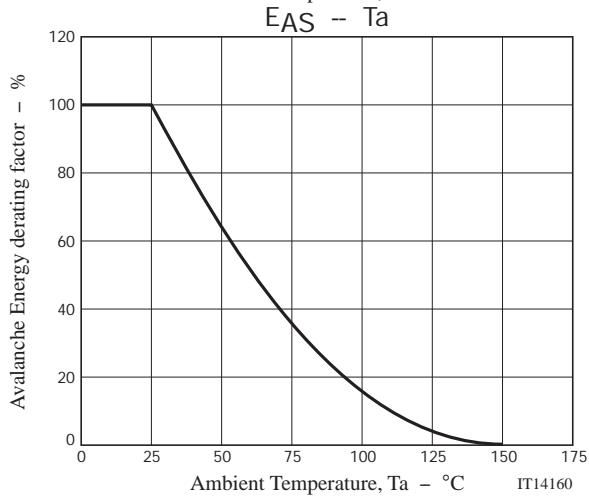
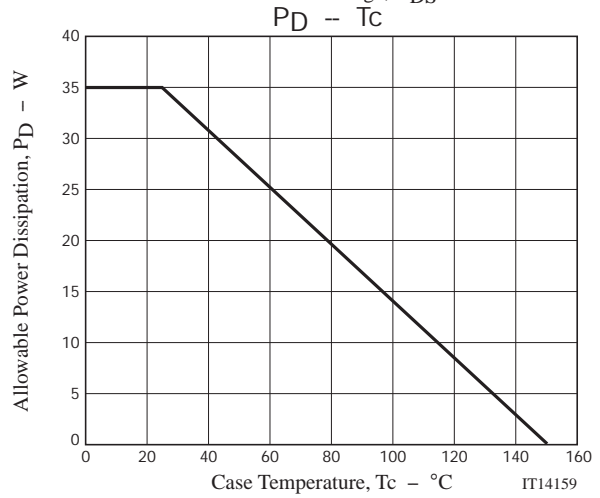
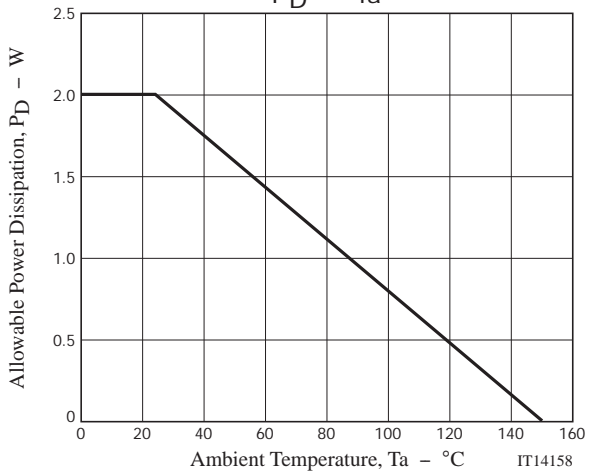
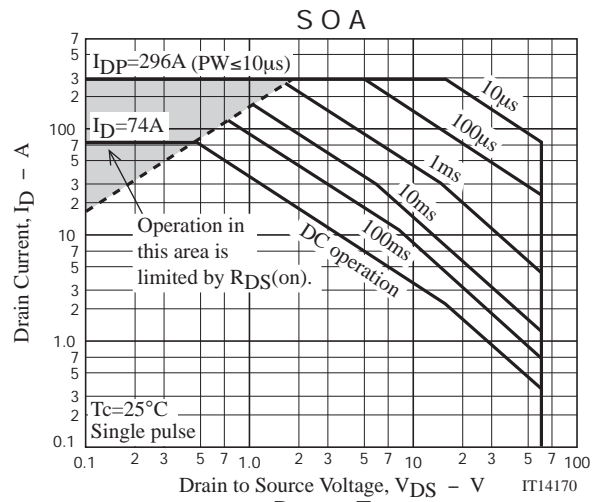
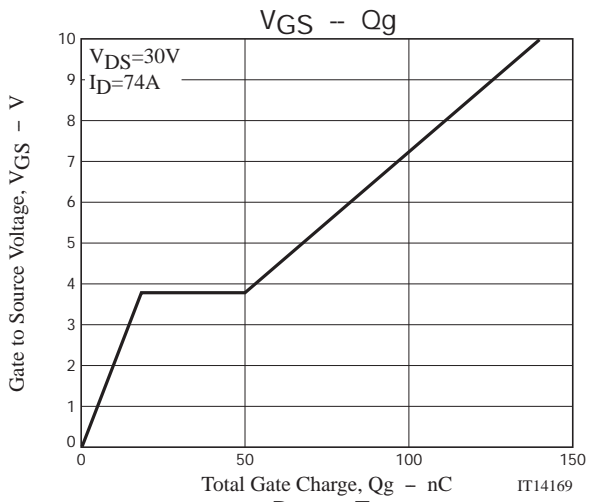
Parameter	Symbol	Conditions	Ratings			Unit
			min	typ	max	
Drain to Source Breakdown Voltage	$V_{(BR)DSS}$	$I_D=1\text{mA}$ , $V_{GS}=0\text{V}$	60			V
Zero-Gate Voltage Drain Current	$I_{DSS}$	$V_{DS}=60\text{V}$ , $V_{GS}=0\text{V}$			1	$\mu\text{A}$
Gate to Source Leakage Current	$I_{GSS}$	$V_{GS}=\pm 16\text{V}$ , $V_{DS}=0\text{V}$			$\pm 10$	$\mu\text{A}$
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS}=10\text{V}$ , $I_D=1\text{mA}$	1.2		2.6	V
Forward Transconductance	$g_{FS}$	$V_{DS}=10\text{V}$ , $I_D=37\text{A}$	32	53		S
Static Drain to Source On-State Resistance	$R_{DS(on)1}$	$I_D=37\text{A}$ , $V_{GS}=10\text{V}$		4.7	6.1	$\text{m}\Omega$
	$R_{DS(on)2}$	$I_D=37\text{A}$ , $V_{GS}=4\text{V}$		7.0	9.8	$\text{m}\Omega$
Input Capacitance	$C_{iss}$			6900		pF
Output Capacitance	$C_{oss}$	$V_{DS}=20\text{V}$ , $f=1\text{MHz}$		740		pF
Reverse Transfer Capacitance	$C_{rss}$			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	$Q_g$				135	
Gate to Source Charge	$Q_{gs}$	$V_{DS}=30\text{V}$ , $V_{GS}=10\text{V}$ , $I_D=74\text{A}$		18		nC
Gate to Drain "Miller" Charge	$Q_{gd}$			32		nC
Diode Forward Voltage	$V_{SD}$	$I_S=74\text{A}$ , $V_{GS}=0\text{V}$		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.





# BBL4001

## Package Dimensions

BBL4001-1E

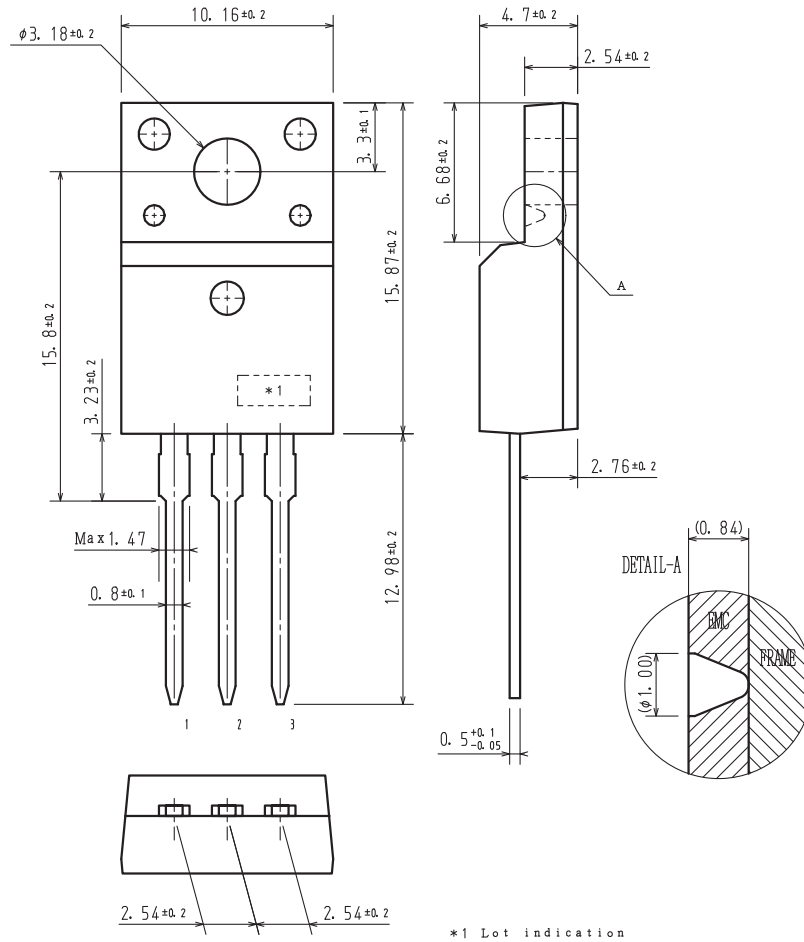
TO-220 Fullpack, 3-Lead / TO-220F-3SG

CASE 221AT

ISSUE A

unit : mm

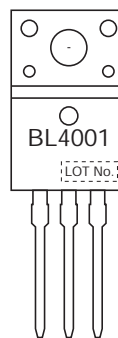
- 1: Gate
- 2: Drain
- 3: Source



## Ordering & Package Information

Device	Package	Shipping	memo
BBL4001-1E	TO-220F-3SG SC-67	50 pcs. / tube	Pb-Free

## Marking



## Electrical Connection

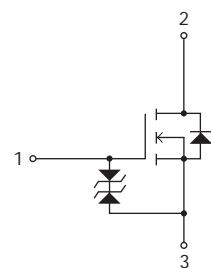


Fig.1 Unclamped Inductive Switching Test Circuit

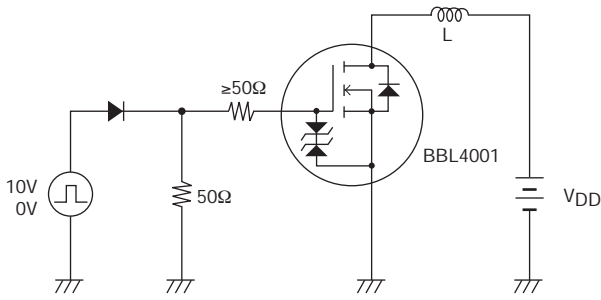
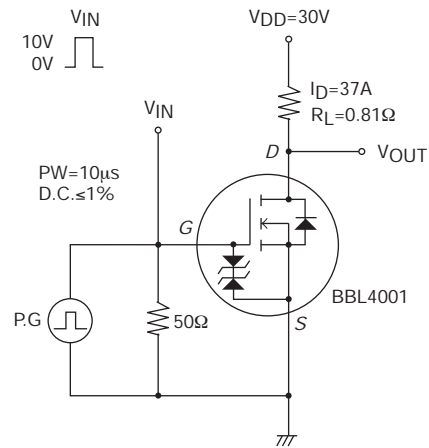


Fig.2 Switching Time Test Circuit



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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