



BBL4001

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

ON Semiconductor®

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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}		± 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.

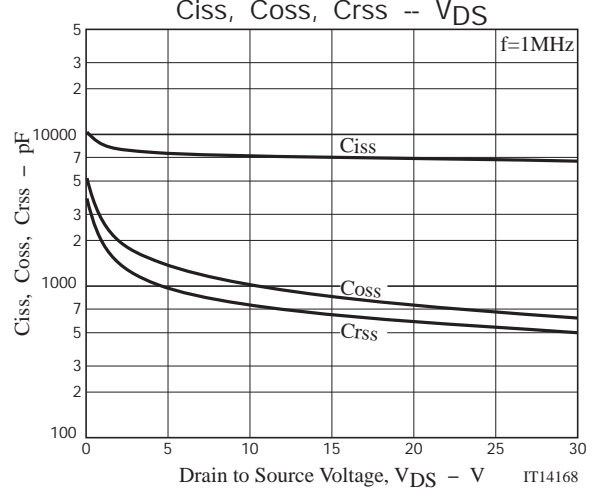
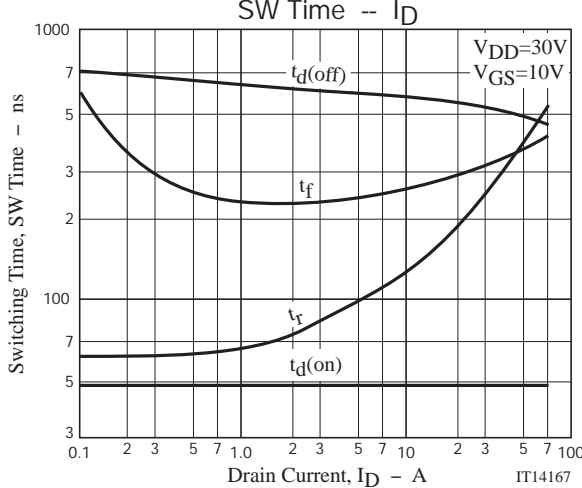
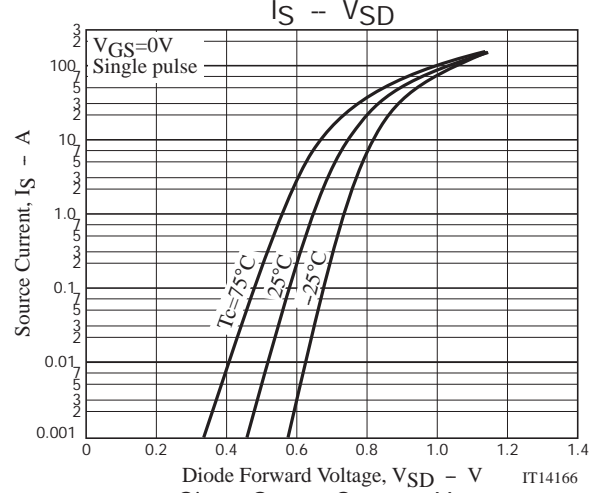
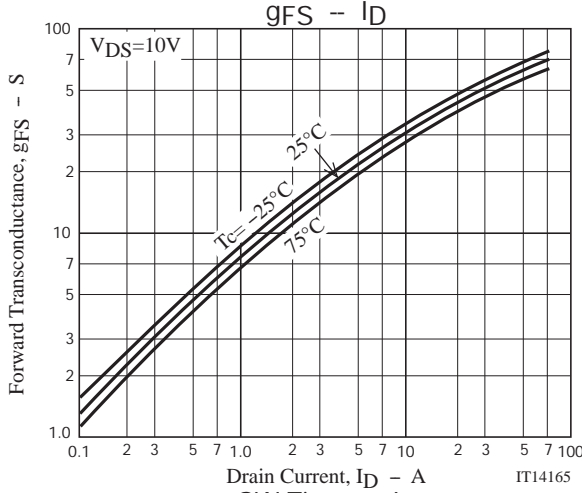
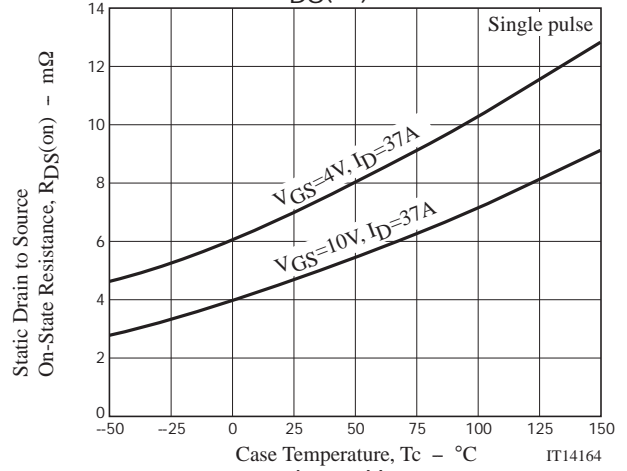
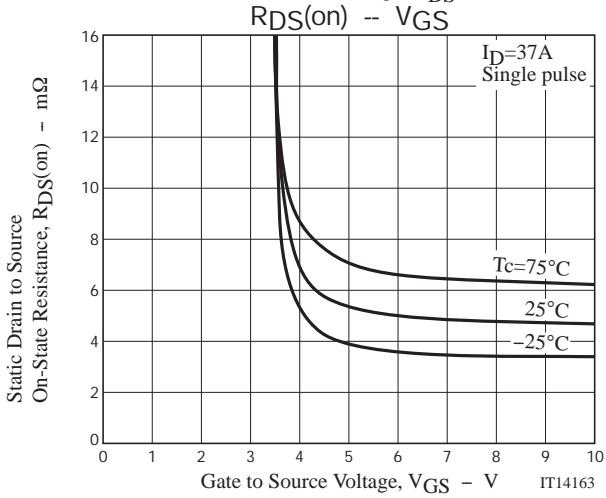
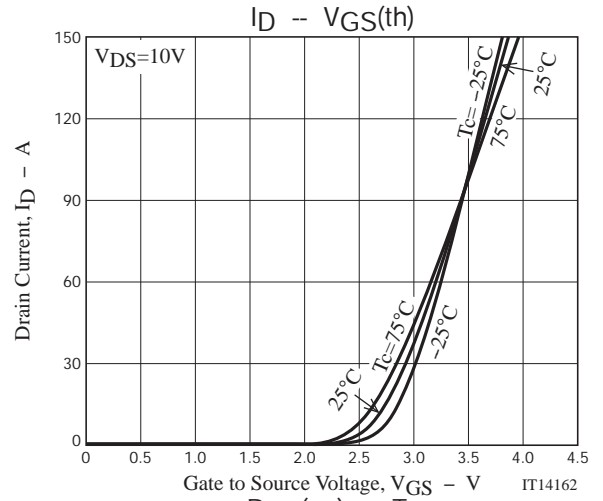
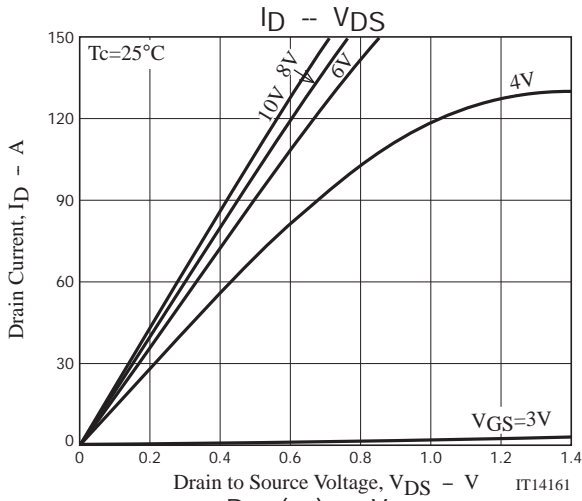
Electrical Characteristics at $T_a=25^\circ\text{C}$

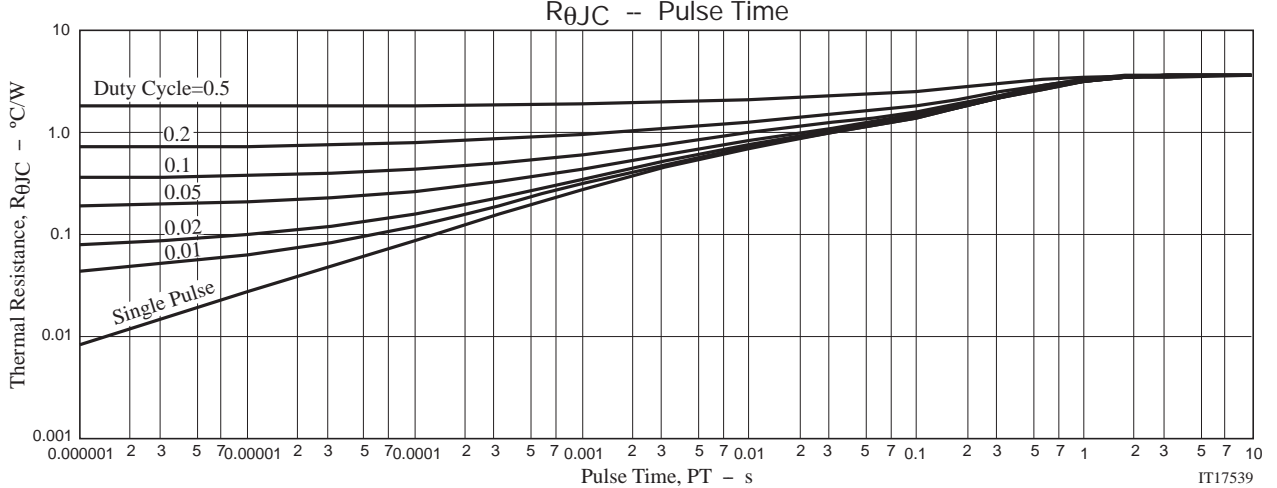
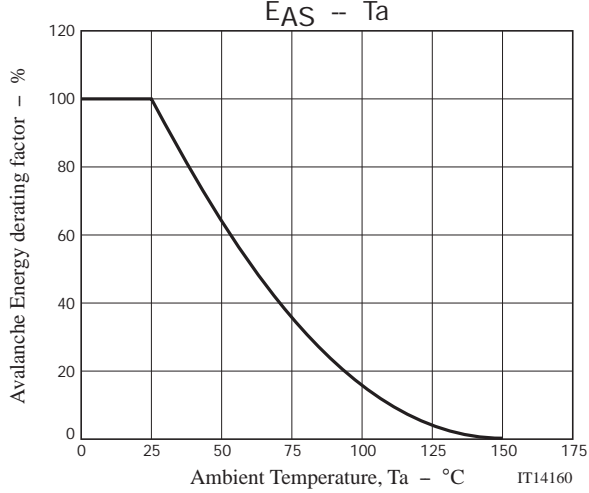
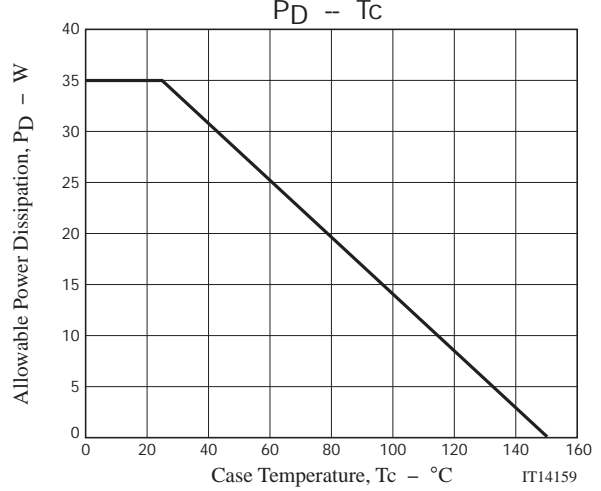
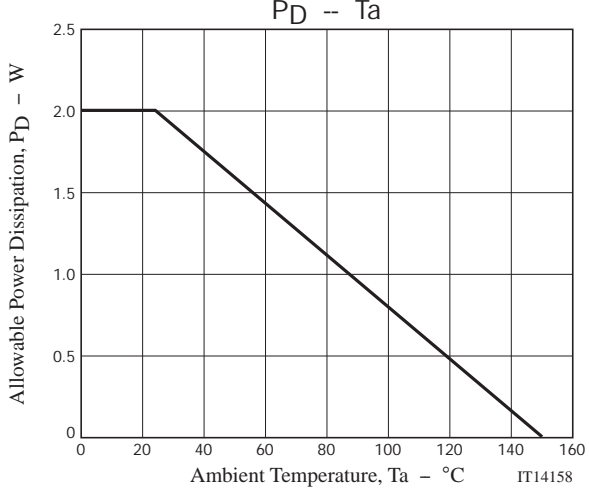
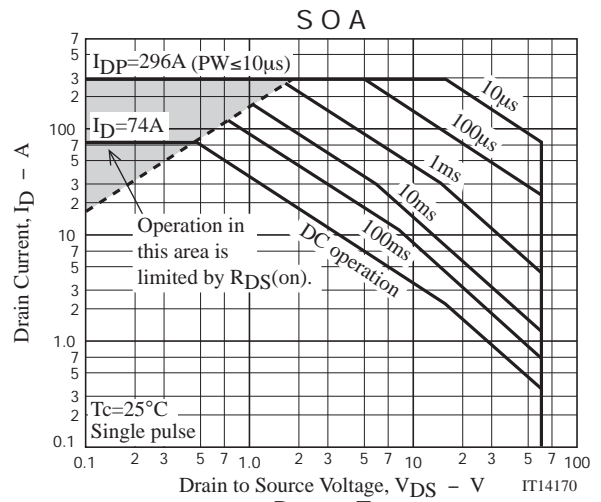
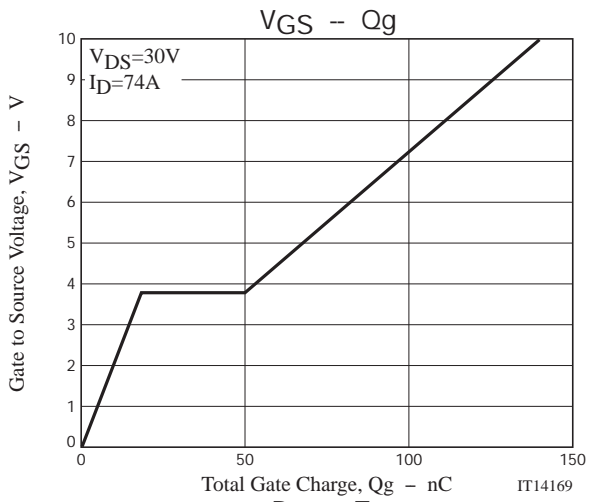
Parameter	Symbol	Conditions	Ratings			Unit
			min	typ	max	
Drain to Source Breakdown Voltage	$V_{(BR)DSS}$	$I_D=1\text{mA}$, $V_{GS}=0\text{V}$	60			V
Zero-Gate Voltage Drain Current	I_{DSS}	$V_{DS}=60\text{V}$, $V_{GS}=0\text{V}$			1	μA
Gate to Source Leakage Current	I_{GSS}	$V_{GS}=\pm 16\text{V}$, $V_{DS}=0\text{V}$			± 10	μA
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

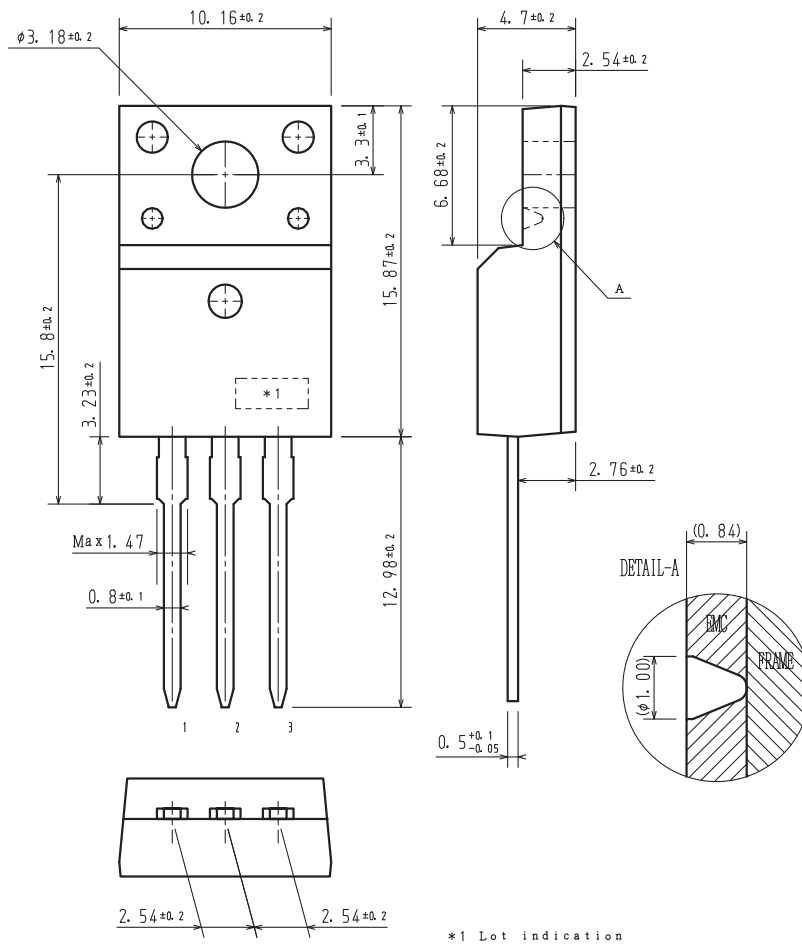
TO-220 Fullpack, 3-Lead / TO-220F-3SG

CASE 221AT

ISSUE A

unit : mm

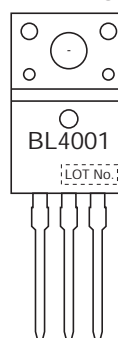
- 1: Gate
- 2: Drain
- 3: Source



Ordering & Package Information

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

Marking



Electrical Connection

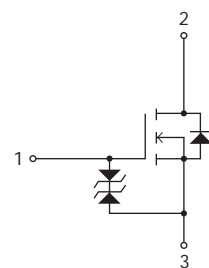


Fig.1 Unclamped Inductive Switching Test Circuit

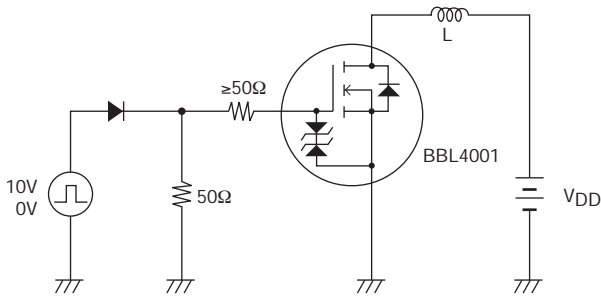
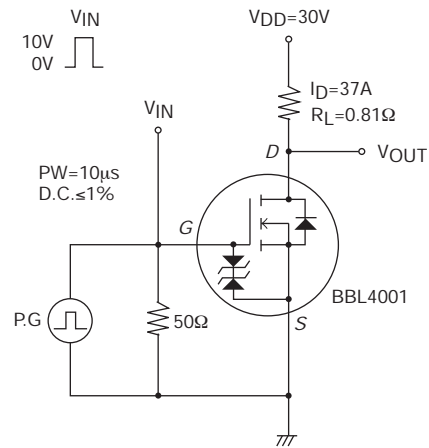


Fig.2 Switching Time Test Circuit



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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