



# BBS3002

## P-Channel Power MOSFET -60V, -100A, 5.8mΩ, TO-263-2L/TO-263

ON Semiconductor®

<http://onsemi.com>

TO-263

### Features

- ON-resistance  $R_{DS(on)1}=4.4\text{m}\Omega$  (typ.)
- Input capacitance  $C_{iss}=13200\text{pF}$  (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)	$I_D$		-100	A
Drain Current (Pulse)	$I_{DP}$	$PW \leq 10\mu\text{s}$ , duty cycle $\leq 1\%$	-400	A
Allowable Power Dissipation	$P_D$	$T_c=25^\circ\text{C}$	90	W
Channel Temperature	$T_{ch}$		150	$^\circ\text{C}$
Storage Temperature	$T_{stg}$		-55 to +150	$^\circ\text{C}$
Avalanche Energy (Single Pulse) *1	$E_{AS}$		340	mJ
Avalanche Current *2	$I_{AV}$		-60	A

Note : \*1  $V_{DD}=-30\text{V}$ ,  $L=100\mu\text{H}$ ,  $I_{AV}=-60\text{A}$  (Fig.1)\*2  $L \leq 100\mu\text{H}$ , Single pulse

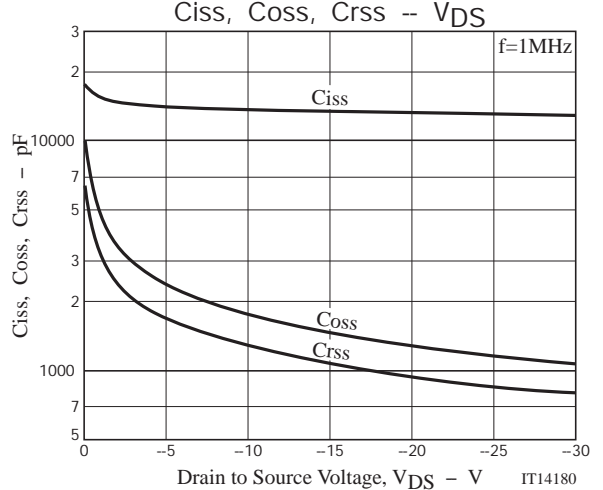
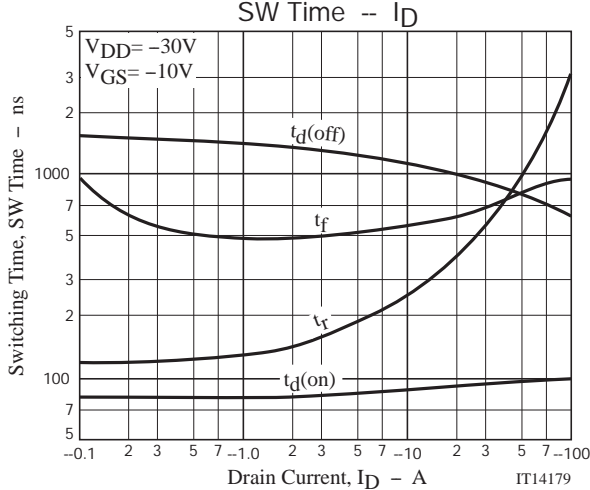
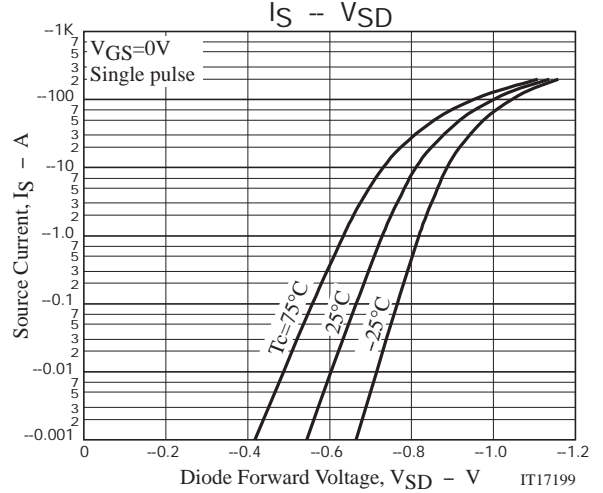
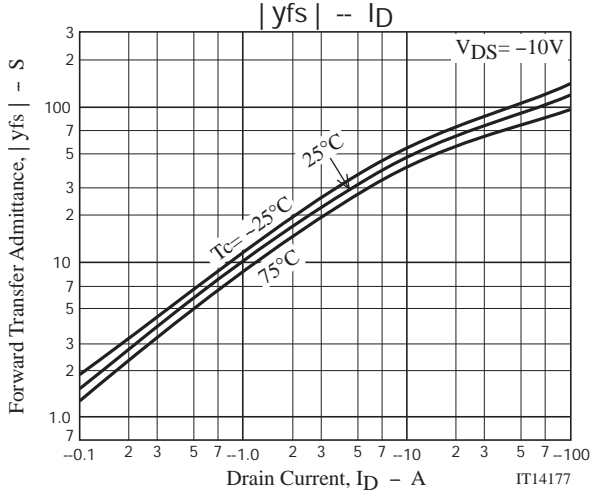
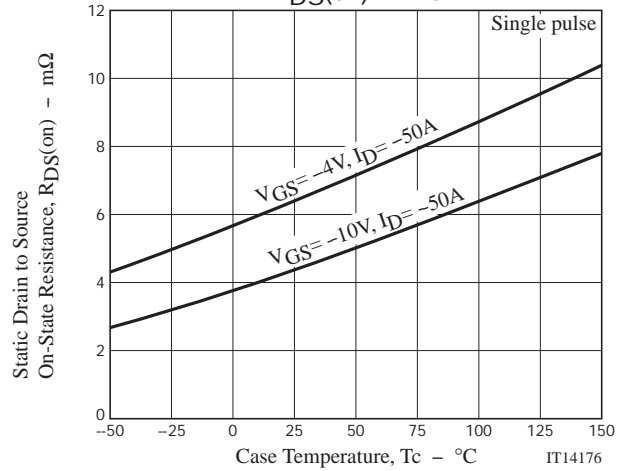
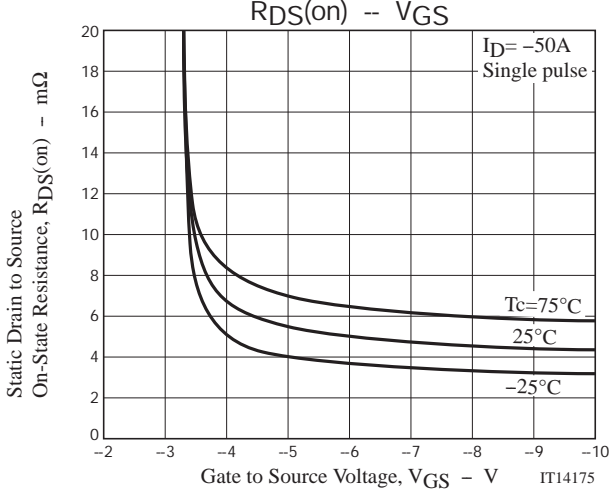
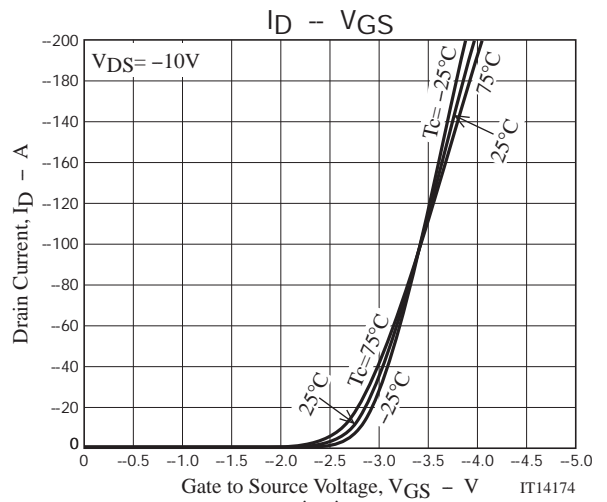
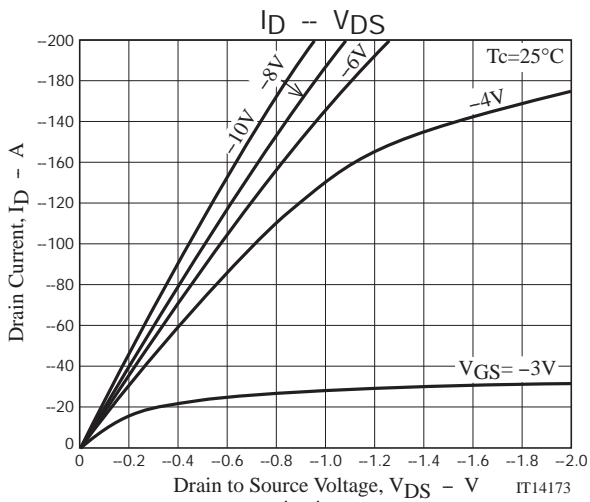
Stresses exceeding Maximum Ratings may damage the device. Maximum Ratings are stress ratings only. Functional operation above the Recommended Operating Conditions is not implied. Extended exposure to stresses above the Recommended Operating Conditions may affect device reliability.

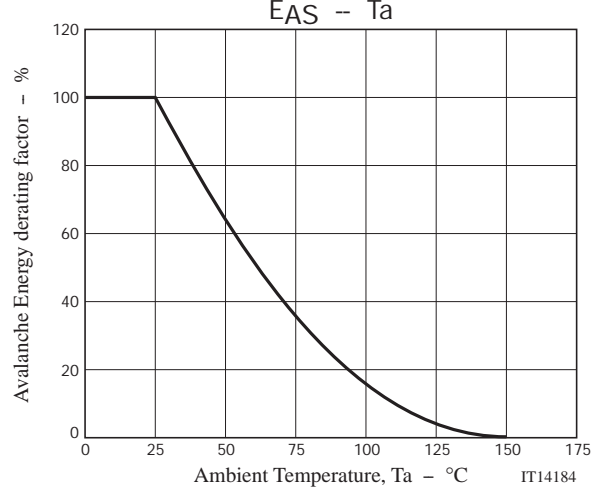
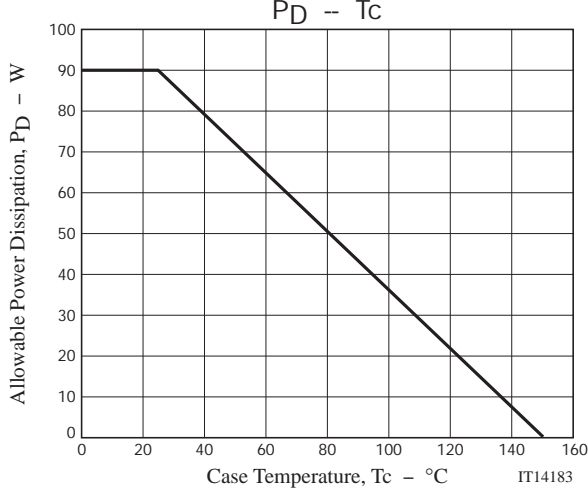
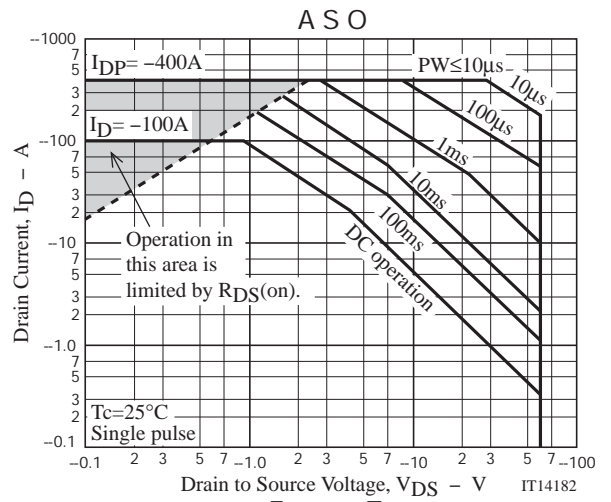
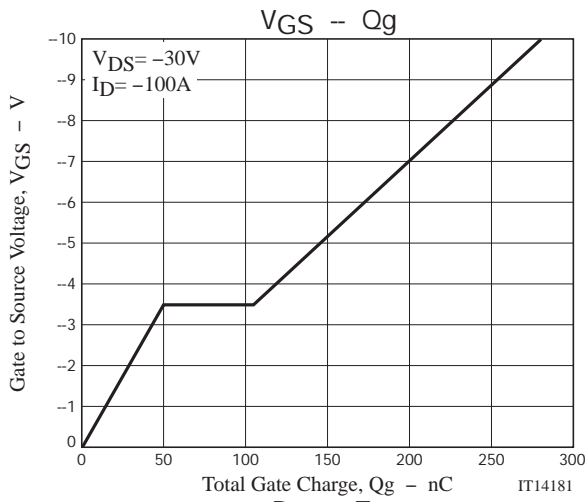
#### Electrical Characteristics at $T_a=25^\circ\text{C}$

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	$I_{GSS}$	$V_{GS}=\pm 16\text{V}$ , $V_{DS}=0\text{V}$			$\pm 10$	$\mu\text{A}$
Cutoff Voltage	$V_{GS(off)}$	$V_{DS}=-10\text{V}$ , $I_D=-1\text{mA}$	-1.2		-2.6	V
Forward Transfer Admittance	$ y_{fs} $	$V_{DS}=-10\text{V}$ , $I_D=-50\text{A}$	54	90		S
Static Drain to Source On-State Resistance	$R_{DS(on)1}$	$I_D=-50\text{A}$ , $V_{GS}=-10\text{V}$		4.4	5.8	$\text{m}\Omega$
	$R_{DS(on)2}$	$I_D=-50\text{A}$ , $V_{GS}=-4\text{V}$		6.4	9.0	$\text{m}\Omega$
Input Capacitance	$C_{iss}$			13200		pF
Output Capacitance	$C_{oss}$	$V_{DS}=-20\text{V}$ , $f=1\text{MHz}$		1300		pF
Reverse Transfer Capacitance	$C_{rss}$			950		pF
Turn-ON Delay Time	$t_d(on)$	See Fig.2		95		ns
Rise Time	$t_r$			1000		ns
Turn-OFF Delay Time	$t_d(off)$			800		ns
Fall Time	$t_f$			820		ns
Total Gate Charge	$Q_g$				280	
Gate to Source Charge	$Q_{gs}$	$V_{DS}=-30\text{V}$ , $V_{GS}=-10\text{V}$ , $I_D=-100\text{A}$		50		nC
Gate to Drain "Miller" Charge	$Q_{gd}$			55		nC
Diode Forward Voltage	$V_{SD}$	$I_S=-100\text{A}$ , $V_{GS}=0\text{V}$	-1.0		-1.5	V

### ORDERING INFORMATION

See detailed ordering and shipping information on page 6 of this data sheet.





Package Dimensions

BBS3002-DL-1E

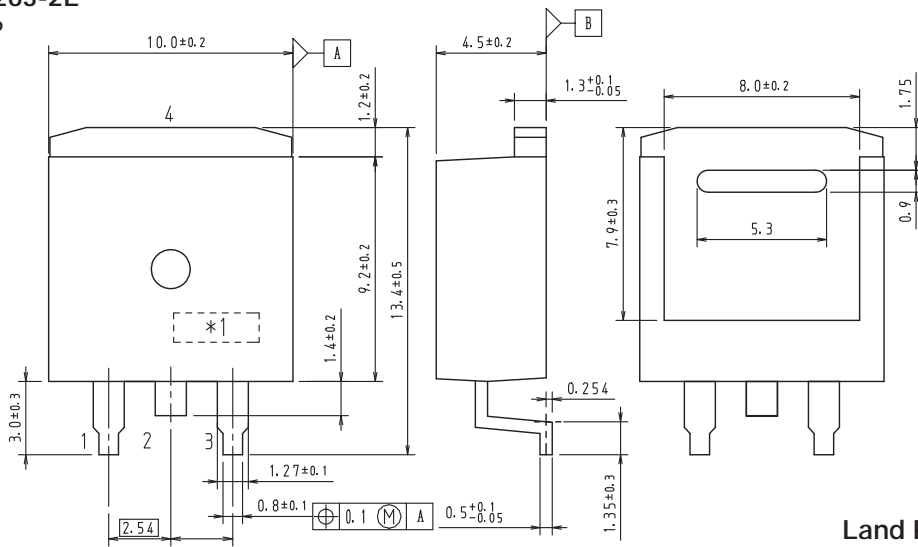
D2PAK/TO-263-2L

CASE 418AP

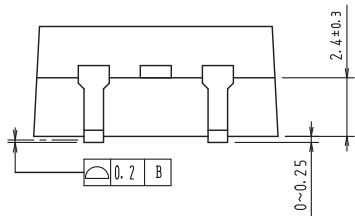
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Unit : mm

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

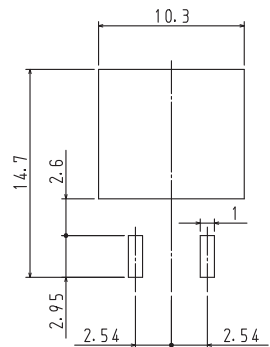


Land Pattern Example

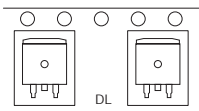


- 1. These dimension do not include mold protrusion
- 2. Pin2 is idle pin with electrical designation only carried

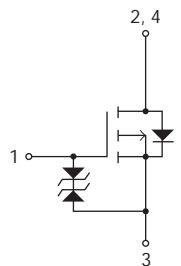
\*1: Lot indication



Packing Type: DL



Electrical Connection

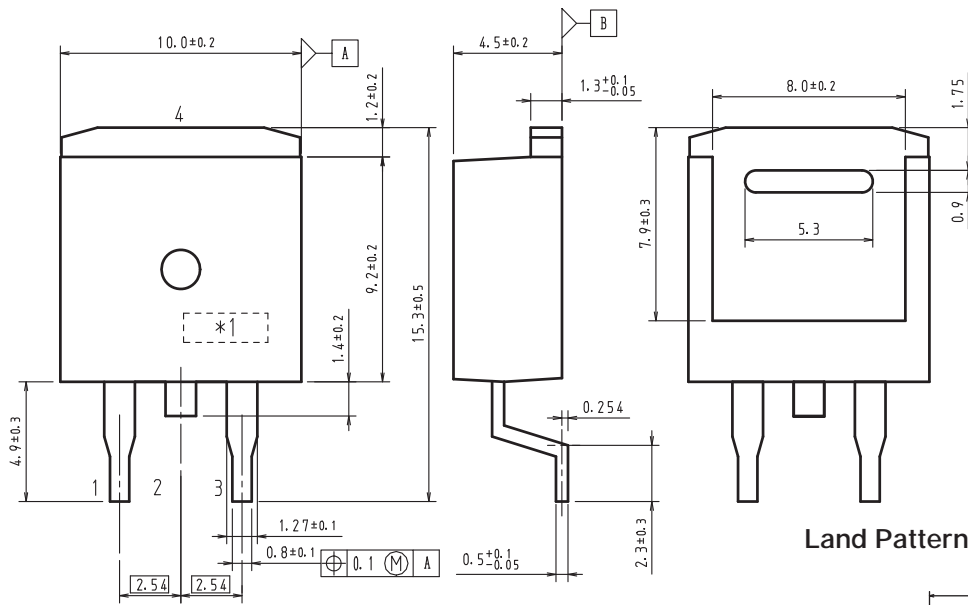


Package Dimensions

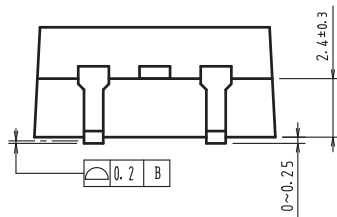
BBS3002-TL-1E

Unit : mm

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

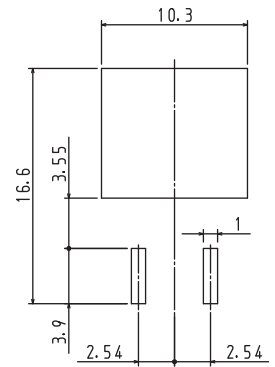


Land Pattern Example

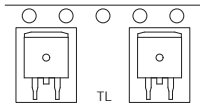


1. These dimension do not include mold protrusion
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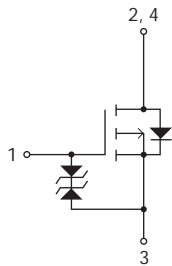
\*1: Lot indication



Packing Type: TL



Electrical Connection



Ordering & Package Information

Device	Package	Shipping	memo
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BBS3002-TL-1E	TO-263		

Marking

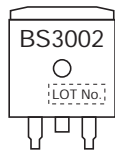


Fig.1 Unclamped Inductive Switching Test Circuit

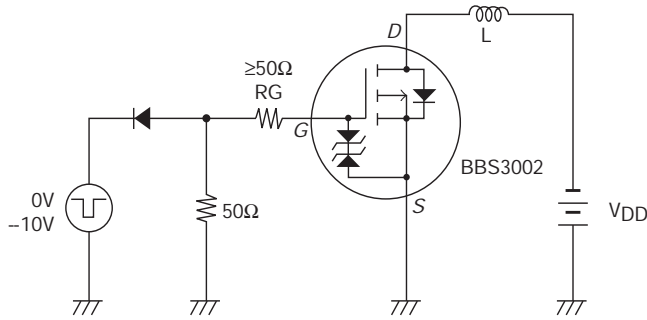
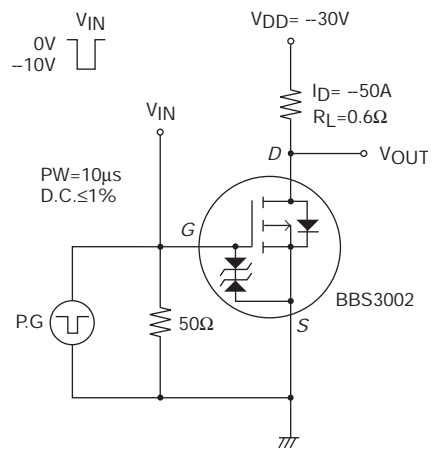


Fig.2 Switching Time Test Circuit



Note on usage : Since the BBS3002 is a MOSFET product, please avoid using this device in the vicinity of highly charged objects.

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