



#### Product Summary

$V_{(BR)DSS}$	$R_{DS(on)TYP}$	$I_D$
-20V	400mΩ@-4.5V	-0.66A
	570mΩ@-2.5V	
	810mΩ@-1.8V	

#### Feature

- Trench Technology Power MOSFET
- Low  $R_{DS(ON)}$
- Low Gate Charge
- ESD Protected

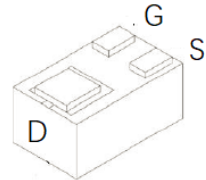
#### Application

- Load Switching
- Low Current Inverters
- Low Current DC/DC Converters

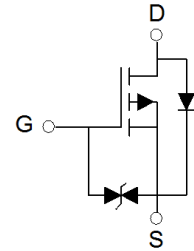
#### MARKING:



#### WBFBP-03E



#### Schematic diagram



#### ABSOLUTE MAXIMUM RATINGS ( $T_A = 25^\circ\text{C}$ unless otherwise noted)

Parameter	Symbol	Value	Unit
Drain - Source Voltage	$V_{DS}$	-20	V
Gate - Source Voltage	$V_{GS}$	$\pm 12$	V
Continuous Drain Current <sup>1,5</sup>	$I_D$	-0.66	A
Pulsed Drain Current <sup>2</sup>	$I_{DM}$	-2.0	A
Power Dissipation <sup>4,5</sup>	$P_D$	0.3	W
Thermal Resistance from Junction to Ambient <sup>5</sup>	$R_{\theta JA}$	416	$^\circ\text{C}/\text{W}$
Junction Temperature	$T_J$	150	$^\circ\text{C}$
Storage Temperature	$T_{STG}$	-55~ +150	$^\circ\text{C}$

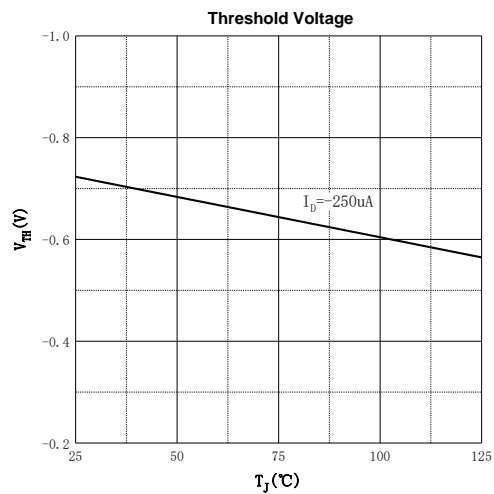
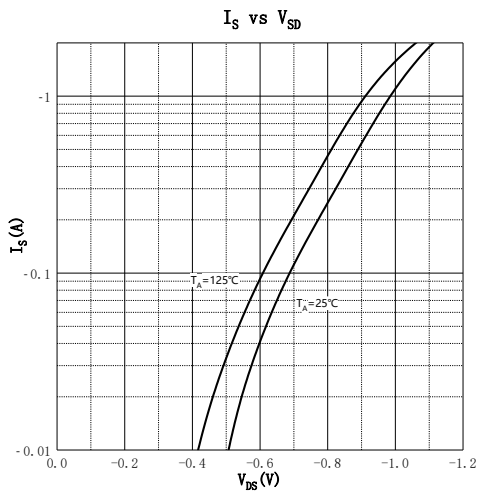
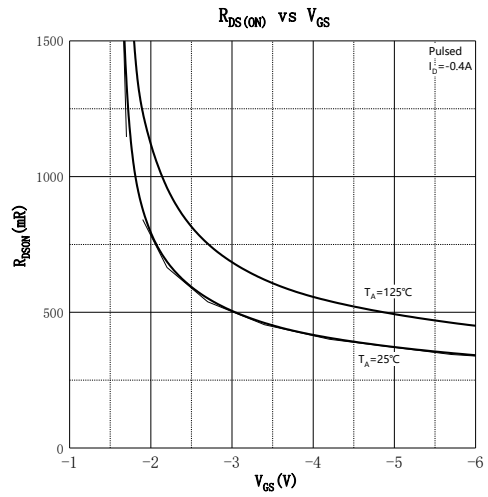
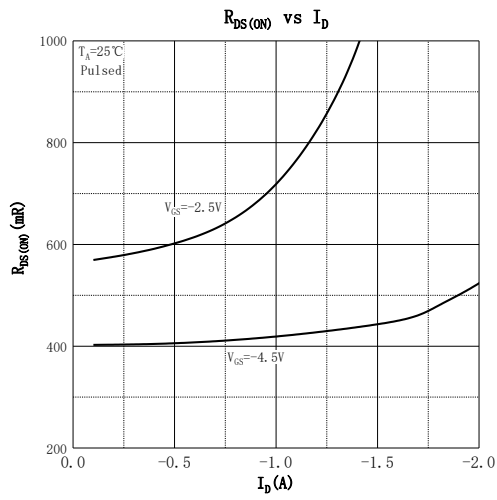
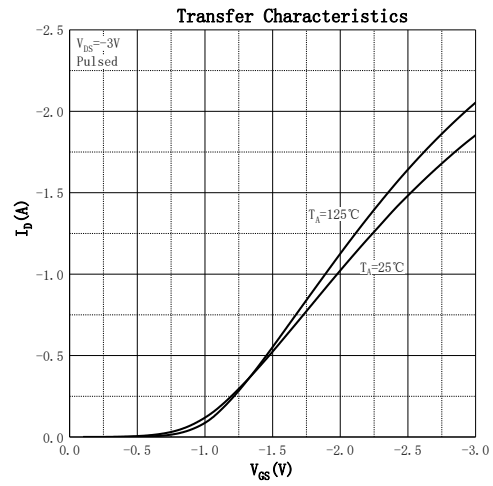
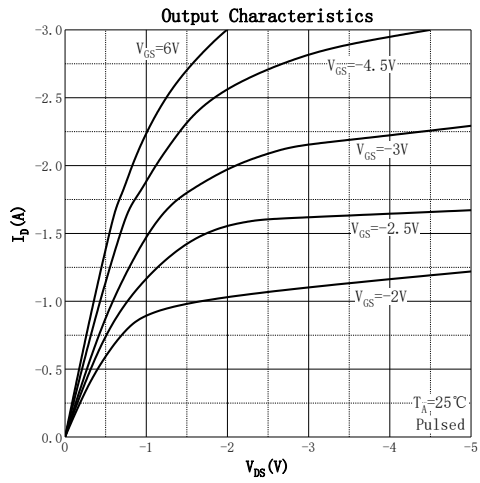
**MOSFET ELECTRICAL CHARACTERISTICS (T<sub>J</sub> = 25°C unless otherwise noted)**

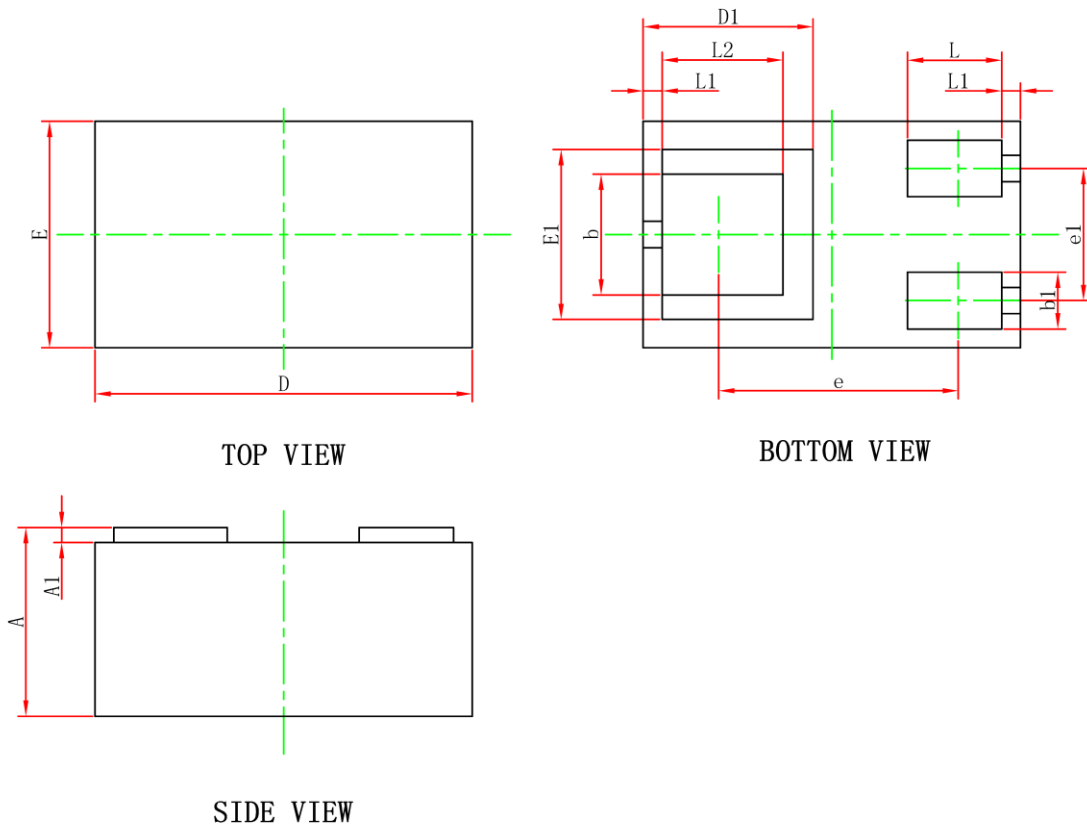
Parameter	Symbol	Test Condition	Min	Type	Max	Unit
<b>Off Characteristics</b>						
Drain - Source Breakdown Voltage	V <sub>(BR)DSS</sub>	V <sub>GS</sub> = 0V, I <sub>D</sub> = -250μA	-20			V
Zero Gate Voltage Drain Current	I <sub>DSS</sub>	V <sub>DS</sub> = -16V, V <sub>GS</sub> = 0V			-1	μA
Gate - Body Leakage Current	I <sub>GSS</sub>	V <sub>GS</sub> = ±10V, V <sub>DS</sub> = 0V			±10	μA
<b>On Characteristics<sup>3</sup></b>						
Gate Threshold Voltage	V <sub>GS(th)</sub>	V <sub>DS</sub> = V <sub>GS</sub> , I <sub>D</sub> = -250μA	-0.4	-0.7	-1.0	V
Drain-source On-resistance	R <sub>DS(on)</sub>	V <sub>GS</sub> = -4.5V, I <sub>D</sub> = -0.5A		400	520	mΩ
		V <sub>GS</sub> = -2.5V, I <sub>D</sub> = -0.3A		570	780	
		V <sub>GS</sub> = -1.8V, I <sub>D</sub> = -0.12A		810	1100	
Forward Transconductance	g <sub>FS</sub>	V <sub>DS</sub> = -5V, I <sub>D</sub> = -0.4A		1		S
<b>Dynamic Characteristics</b>						
Input Capacitance	C <sub>iss</sub>	V <sub>DS</sub> = -10V, V <sub>GS</sub> = 0V, f = 1MHz		79		pF
Output Capacitance	C <sub>oss</sub>			15		
Reverse Transfer Capacitance	C <sub>rss</sub>			13		
<b>Switching Characteristics</b>						
Total Gate Charge	Q <sub>g</sub>	V <sub>DS</sub> = -10V, V <sub>GS</sub> = -4.5V, I <sub>D</sub> = -0.2A		2.26		nC
Gate-source Charge	Q <sub>gs</sub>			0.45		
Gate-drain Charge	Q <sub>gd</sub>			0.24		
Turn-on Delay Time	t <sub>d(on)</sub>	V <sub>DD</sub> = -10V, V <sub>GS</sub> = -4.5V, R <sub>L</sub> = 50Ω, R <sub>G</sub> = 3Ω		8		ns
Turn-on Rise Time	t <sub>r</sub>			5.5		
Turn-off Delay Time	t <sub>d(off)</sub>			30		
Turn-off Fall Time	t <sub>f</sub>			17		
<b>Source - Drain Diode Characteristics</b>						
Diode Forward Voltage <sup>3</sup>	V <sub>SD</sub>	V <sub>GS</sub> = 0V, I <sub>S</sub> = -0.5A			1.2	V

Notes :

- 1.The maximum current rating is limited by package.
- 2.Repetitive rating;pulse width limited by T<sub>J</sub>(MAX) = 150°C.
- 3.Pulse Test : Pulse Width ≤ 300μs, duty cycle ≤ 2%.
- 4.The power dissipation PD is limited by T<sub>J</sub>(MAX) = 150°C.
- 5.Device mounted on 1in2 FR-4 board with 2oz. Copper, in a still air environment with TA =25°C.

**Typical Characteristics**



**WBFBP-03E Package Information**


Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	0.450	0.550	0.018	0.022
A1	0.010	0.100	0.000	0.004
D	0.950	1.050	0.037	0.041
E	0.550	0.650	0.022	0.026
D1	0.450REF		0.018REF	
E1	0.450REF		0.018REF	
b	0.270	0.370	0.011	0.015
b1	0.100	0.200	0.004	0.008
e	0.635REF		0.025REF	
e1	0.300	0.400	0.012	0.016
L	0.200	0.300	0.008	0.012
L1	0.050REF		0.002REF	
L2	0.270	0.370	0.011	0.015