



## MOSFET ELECTRICAL CHARACTERISTICS

$T_a=25\text{ }^\circ\text{C}$  unless otherwise specified

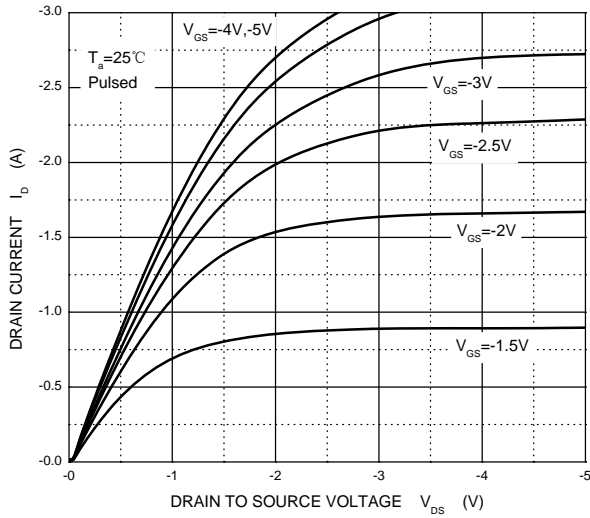
Parameter	Symbol	Test Condition	Min	Typ	Max	Unit
<b>STATIC PARAMETERS</b>						
Drain-source breakdown voltage	$V_{(BR)DSS}$	$V_{GS} = 0V, I_D = -250\mu A$	-20			V
Zero gate voltage drain current	$I_{DSS}$	$V_{DS} = -20V, V_{GS} = 0V$			-1	$\mu A$
Gate-body leakage current	$I_{GSS}$	$V_{GS} = \pm 10V, V_{DS} = 0V$			$\pm 20$	$\mu A$
Gate threshold voltage (note 2)	$V_{GS(th)}$	$V_{DS} = V_{GS}, I_D = -250\mu A$	-0.35		-1.1	V
Drain-source on-resistance(note 2)	$R_{DS(on)}$	$V_{GS} = -4.5V, I_D = -1A$			520	$m\Omega$
		$V_{GS} = -2.5V, I_D = -0.8A$			700	$m\Omega$
		$V_{GS} = -1.8V, I_D = -0.5A$		950		$m\Omega$
Forward tranconductance(note 2)	$g_{FS}$	$V_{DS} = -10V, I_D = -0.54A$		1.2		S
Diode forward voltage	$V_{SD}$	$I_S = -0.5A, V_{GS} = 0V$			-1.2	V
<b>DYNAMIC PARAMETERS(note 4)</b>						
Input Capacitance	$C_{iss}$	$V_{DS} = -16V, V_{GS} = 0V, f = 1MHz$		113	170	pF
Output Capacitance	$C_{oss}$			15	25	pF
Reverse Transfer Capacitance	$C_{rss}$			9	15	pF
<b>SWITCHING PARAMETERS (note 4)</b>						
Turn-on delay time (note 3)	$t_{d(on)}$	$V_{DD} = -4.5V, V_{GS} = -10V,$ $I_D = -200mA, R_{GEN} = 10\Omega$		9		ns
Turn-on rise time (note 3)	$t_r$			5.8		ns
Turn-off delay time (note 3)	$t_{d(off)}$			32.7		ns
Turn-off fall time (note 3)	$t_f$			20.3		ns

### Notes :

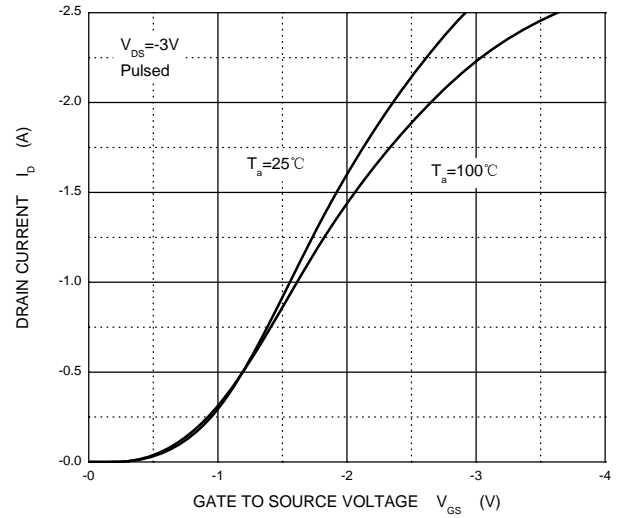
1. Surface mounted on FR4 board using the minimum recommended pad size.
2. Pulse Test : Pulse width=300 $\mu s$ , duty cycle $\leq 2\%$ .
3. Switching characteristics are independent of operating junction temperatures.
4. Guaranteed by design, not subject to producing.

# Typical Characteristics

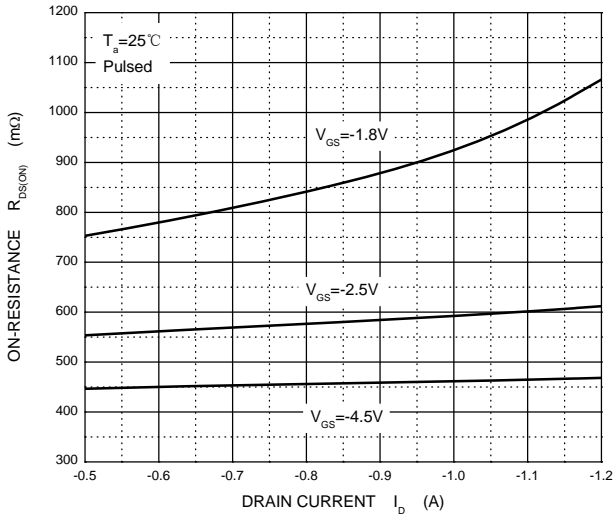
Output Characteristics



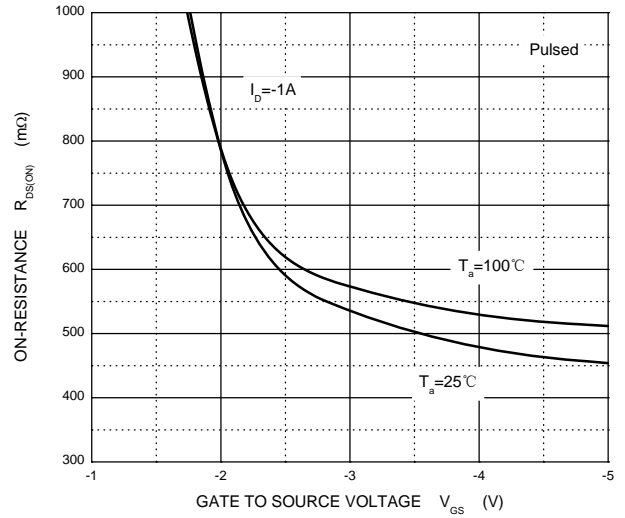
Transfer Characteristics



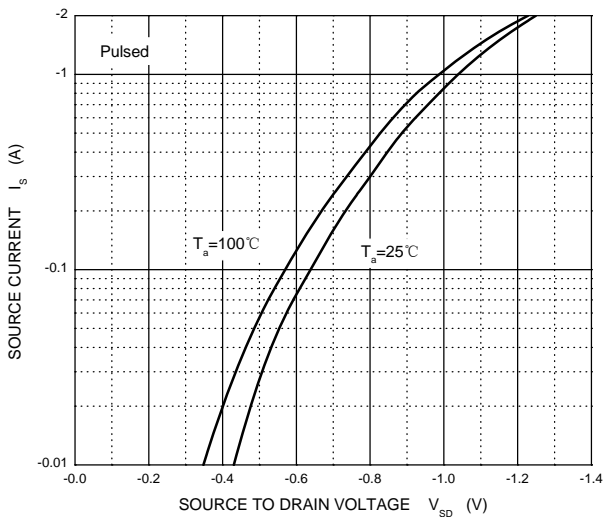
$R_{DS(ON)}$  —  $I_D$



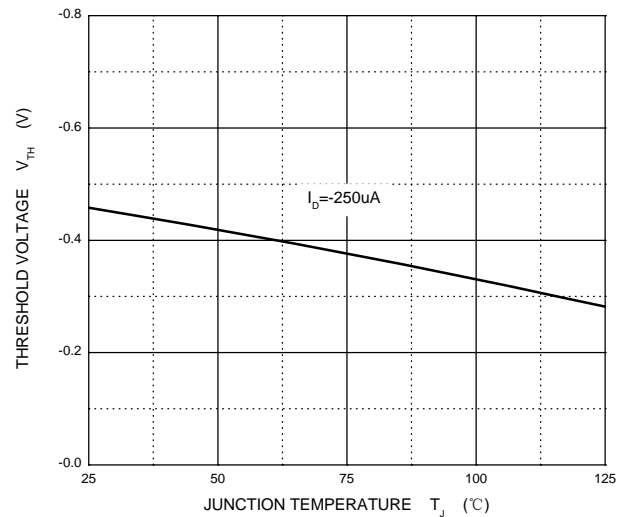
$R_{DS(ON)}$  —  $V_{GS}$



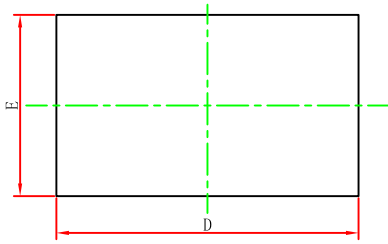
$I_S$  —  $V_{SD}$



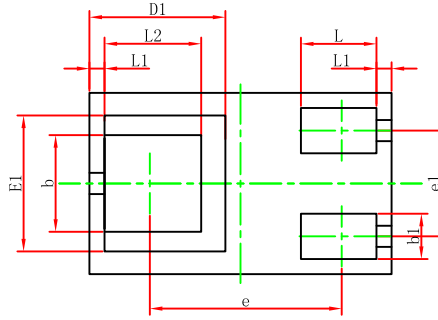
Threshold Voltage



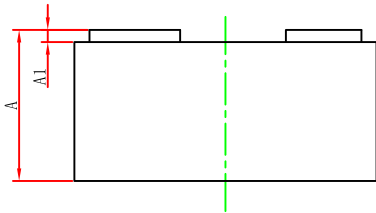
# WBFBP-03E Package Outline Dimensions



TOP VIEW



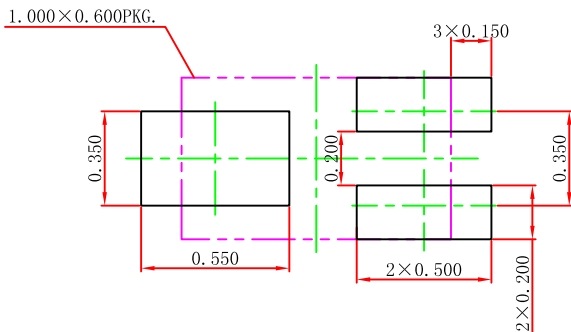
BOTTOM VIEW



SIDE VIEW

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

# WBFBP-03E Suggested Pad Layout



**Note:**

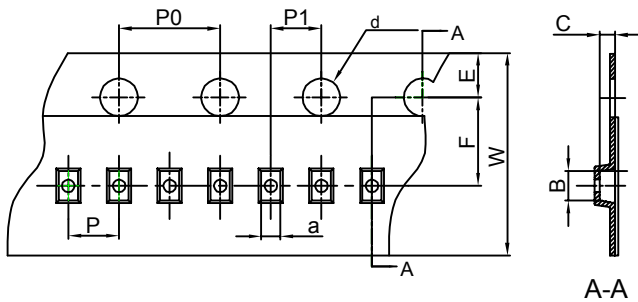
1. Controlling dimension: in millimeters.
2. General tolerance:  $\pm 0.050\text{mm}$ .
3. The pad layout is for reference purposes only.

127, & (

- 6 & - UHVH VVYKHL JWW D NFR GLILFDWLRQV HQKDQFH PHQW VRLR S VUKRHYH PHQW  
 FKDQ JHLW KIR X WQR VVW BQSURGKXFWH 6Q -GRH QRDW V X D Q OLD EDLW LQ J  
 RXW RI WKH DSSOLFDWLRQ RU XVH RI DQ\ SURGXFW GHVFULEHG KHU

# WBFBP-03E(1.0×0.6×0.5) Tape and Reel

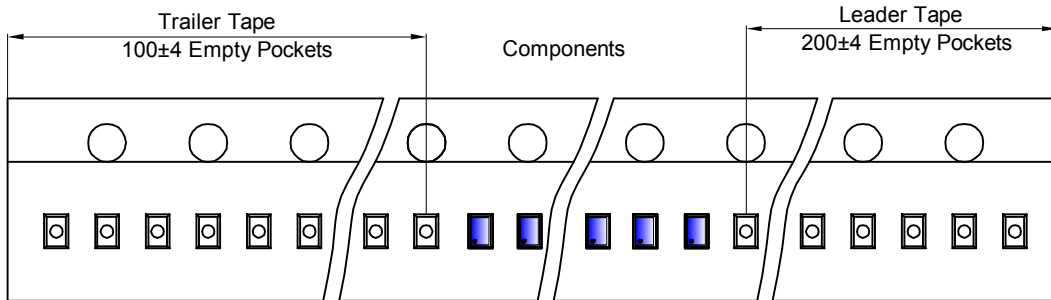
## WBFBP-03E(1.0×0.6×0.5) Embossed Carrier Tape



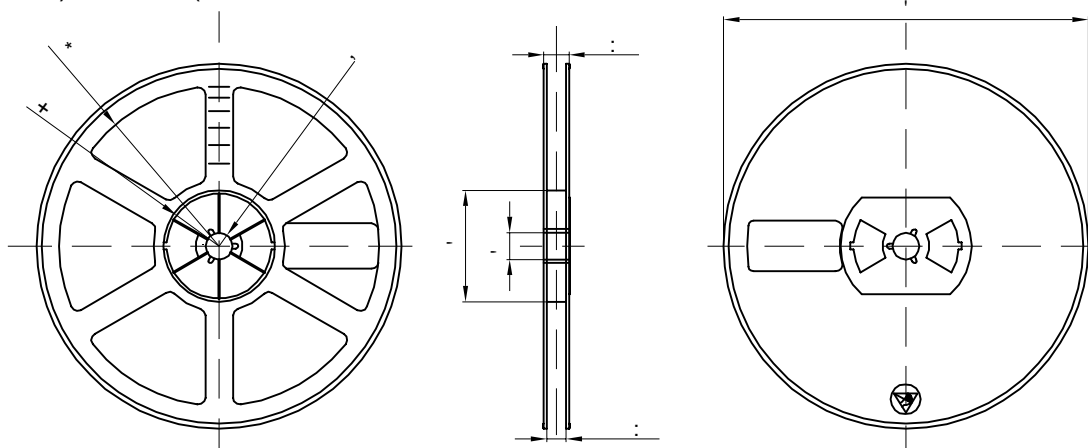
**Packaging Description:**  
**WBFBP-03E(1.0×0.6×0.5)** parts are shipped in tape. The carrier tape is made from a dissipative (carbon filled) polycarbonate resin. The cover tape is a multilayer film (Heat Activated Adhesive in nature) primarily composed of polyester film, adhesive layer, sealant, and anti-static sprayed agent. These reeled parts in standard option are shipped with 10,000 units per 7" or 17.8cm diameter reel. The reels are clear in color and is made of polystyrene plastic (anti-static coated).

Dimensions are in millimeter										
Pkg type	a	B	C	d	E	F	P0	P	P1	W
<b>WBFBP-03E(1.0×0.6×0.5)</b>	0.66	1.15	0.66	Ø1.50	1.75	3.50	4.00	2.00	2.00	8.00

## WBFBP-03E(1.0×0.6×0.5) Tape Leader and Trailer



: %) % 3 ( î î 5 H H O



Dimensions are in millimeter								
Reel Option	D	D1	D2	G	H	I	W1	W2
7" Dia	Ø178.00	54.40	13.00	R78.00	R25.60	R6.50	9.50	12.30

REEL	Reel Size	Box	Box Size(mm)	Carton	Carton Size(mm)	G.W.(kg)
10000 pcs	7 inch	100,000 pcs	203×203×195	400,000 pcs	438×438×220	