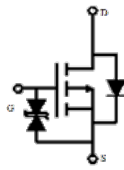


FBP1006

Symbol


Parameter	Value	Unit
V_{DS}	-20	V
$R_{DS(ON)-Max}$	640	m Ω
I_D	-0.85	A

Key Features

- Surface mount package
- Reliable and Rugged
- ROHS Compliant & Halogen-Free
- ESD Protection

Applications

- Small Signal Switch
- Load Switch

Ordering Information

Ordering part Number	Marking code	Package	Form
VPLMDF7175	7175	FBP1006	Tape & Reel

Absolute Maximum Ratings ($T_j = 25^\circ\text{C}$, unless otherwise specified)

Parameter	Symbol	Rating	Unit
Drain-Source Voltage	V_{DS}	-20	V
Gate-Source Voltage	V_{GS}	± 12	V
Maximum Junction Temperature	T_J	150	$^\circ\text{C}$
Storage Temperature Range	T_{STG}	-55 to 150	$^\circ\text{C}$
Pulse Drain Current Tested	$T_A=25^\circ\text{C}$ $I_{DM}^{(1)}$	-2.1	A
Continuous Drain Current	$T_A=25^\circ\text{C}$ I_D	-0.85	A
	$T_A=70^\circ\text{C}$	-0.68	
Maximum Power Dissipation	$T_A=25^\circ\text{C}$ P_D	0.69	W
	$T_A=70^\circ\text{C}$	0.44	

Thermal Characteristics

Parameter	Symbol	Rating	Unit
Thermal Resistance-Junction to Ambient	Steady State $R_{\theta JA}^{(2)}$	180	$^\circ\text{C/W}$

- ⁽¹⁾ Max. current is limited by junction temperature.
- ⁽²⁾ Surface Mounted on 1in² FR-4 board with 1oz.

Electrical Characteristics ($T_j = 25^\circ\text{C}$, unless otherwise specified)

Static Characteristics

Parameter	Symbol	Min.	Typ.	Max.	Unit	Test Conditions
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	-20	-	-	V	$V_{GS}=0V, I_{DS}=-250\mu A$
Zero Gate Voltage Drain Current	I_{DSS}	-	-	-1	μA	$V_{DS}=-16V, V_{GS}=0V$
Gate Threshold Voltage	$V_{GS(th)}$	-0.5	-0.75	-1	V	$V_{DS}=V_{GS}, I_{DS}=-250\mu A$
Gate Leakage Current	I_{GSS}	-	-	± 10	μA	$V_{GS}=\pm 12V, V_{DS}=0V$
Drain-Source On-state Resistance	$R_{DS(ON)}^{(3)}$	-	530	640	m Ω	$V_{GS}=-4.5V, I_{DS}=-550mA$
		-	730	950		$V_{GS}=-2.5V, I_{DS}=-450mA$
		-	1300	1950		$V_{GS}=-1.8V, I_{DS}=-350mA$
Forward Transconductance	g_{fs}	-	1	-	S	$V_{DS}=-5V, I_{DS}=-550mA$

Dynamic Characteristics⁽⁴⁾

Parameter	Symbol	Min.	Typ.	Max.	Unit	Test Conditions
Input Capacitance	C_{iss}	-	58	-	pF	$V_{GS}=0V, V_{DS}=-10V,$ Freq.=1MHz
Output Capacitance	C_{oss}	-	5.7	-		
Reverse Transfer Capacitance	C_{rss}	-	4.4	-		
Turn-on Delay Time	$t_{d(ON)}$	-	0.4	-	nS	$V_{GS}=-4.5V, V_{DS}=-10V,$ $I_D=-1A, R_{GEN}=6\Omega$
Turn-on Rise Time	t_r	-	0.06	-		
Turn-off Delay Time	$t_{d(OFF)}$	-	0.02	-		
Turn-off Fall Time	t_f	-	0.8	-		

Gate Charge Characteristics

Parameter	Symbol	Min.	Typ.	Max.	Unit	Test Conditions
Total Gate Charge	Q_g	-	0.53	-	nC	$V_{GS}=-2.5V, V_{DS}=-10V,$ $I_D=-1A$
		-	0.8	-		$V_{GS}=-4.5V, V_{DS}=-10V,$ $I_D=-1A$
Gate-Source Charge	Q_{gs}	-	0.2	-		
Gate-Drain Charge	Q_{gd}	-	0.2	-		

Source Drain Diode Characteristics

Parameter	Symbol	Min.	Typ.	Max.	Unit	Test Conditions
Diode Forward Voltage	$V_{SD}^{(4)}$	-	-0.75	-1.1	V	$I_{SD}=-1A, V_{GS}=0V$
Reverse Recovery Time	t_{rr}	-	9.2	-	nS	$I_F=-1A, V_R=0V$ & $di_F/dt=100A/\mu s$
Reverse Recovery Charge	Q_{rr}	-	0.8	-	nC	

- ⁽³⁾ Pulse test (pulse width $\leq 300\mu s$, duty cycle $\leq 2\%$).
- ⁽⁴⁾ Guaranteed by design, not subject to production testing.

Electrical Characteristic Diagrams

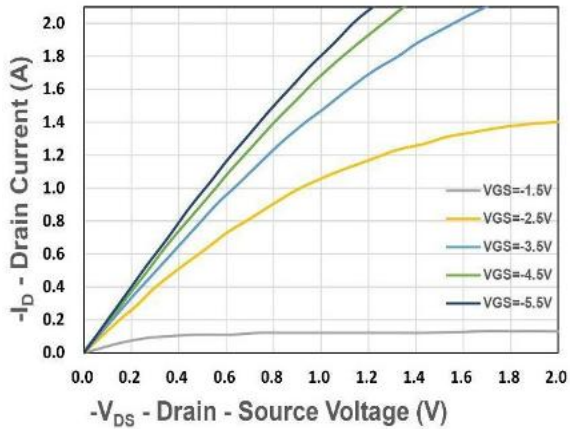


Figure 1. Output Characteristics

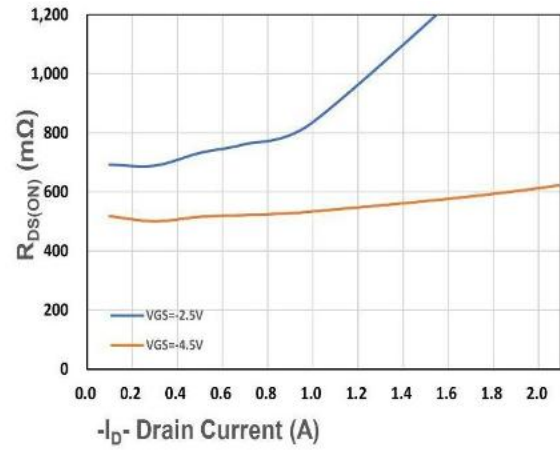


Figure 2. On-Resistance vs. ID

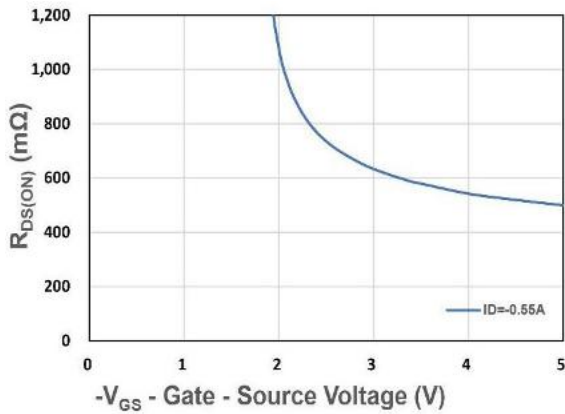


Figure 3. On-Resistance vs. VGS

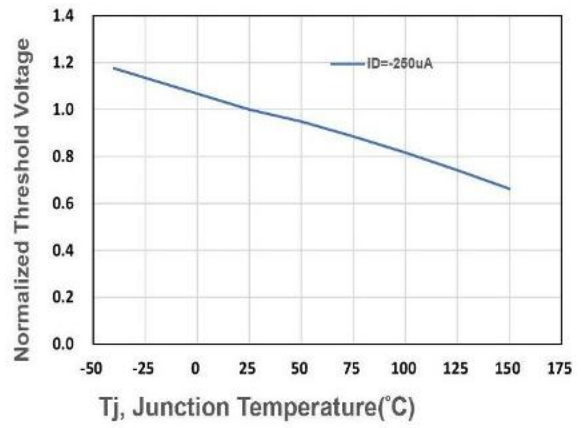


Figure 4. Gate Threshold Voltage

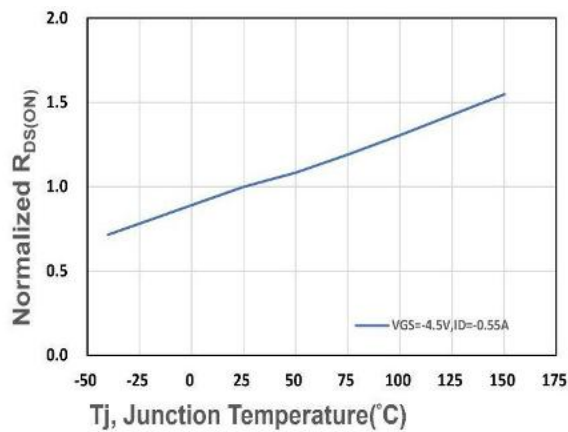


Figure 5. Drain-Source On Resistance

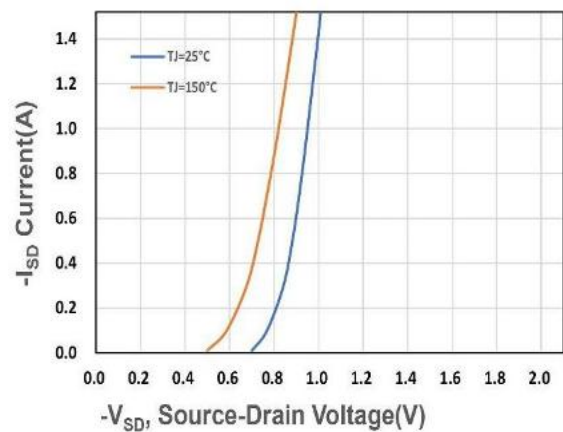


Figure 6. Source-Drain Diode Forward

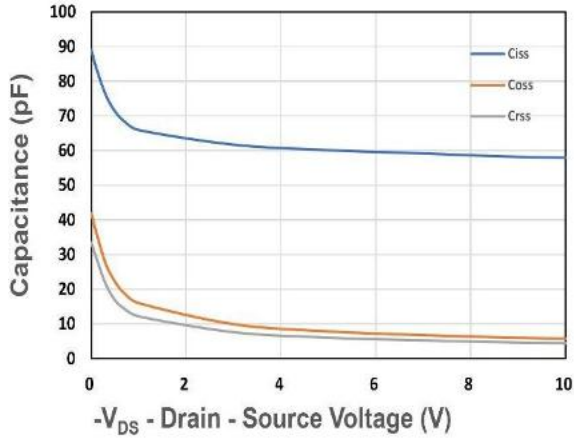


Figure 7. Capacitance

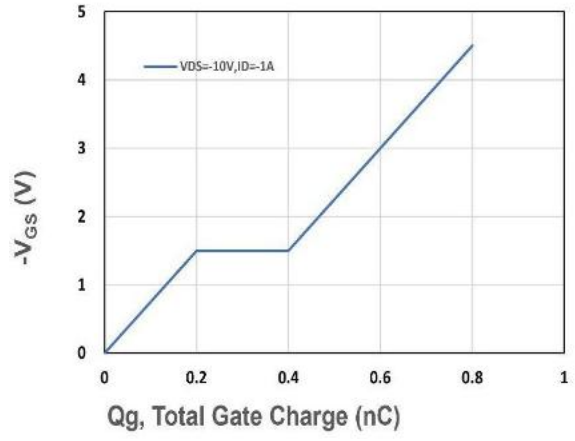


Figure 8. Gate Charge Characteristics

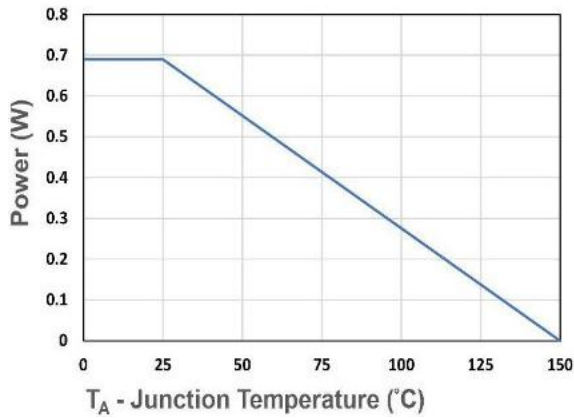


Figure 9. Power Dissipation

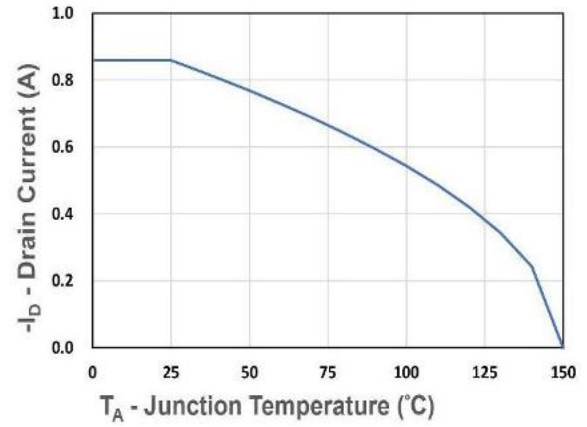


Figure 10. Drain Current

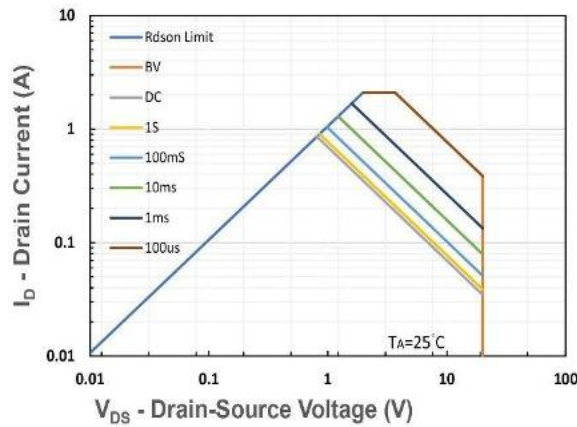


Figure 11. Safe Operating Area

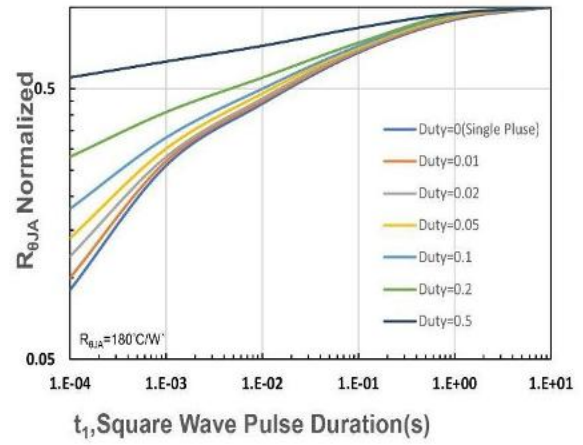
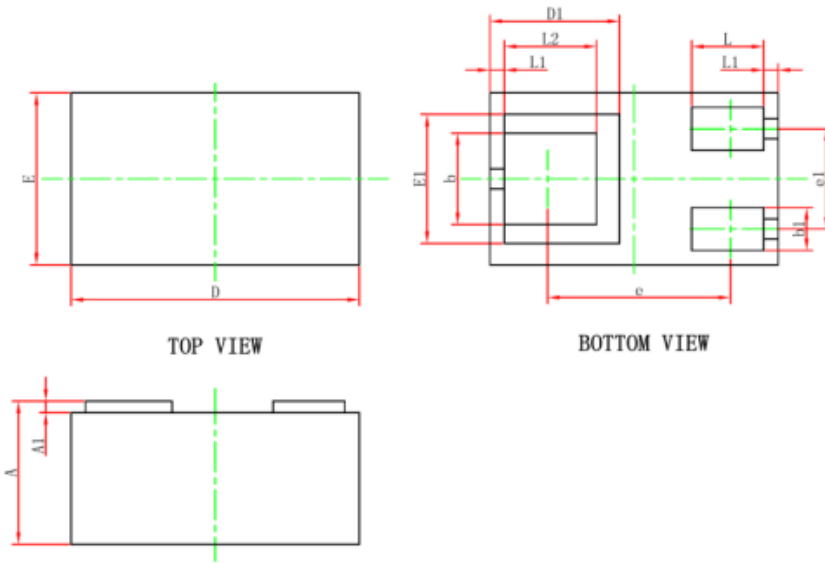


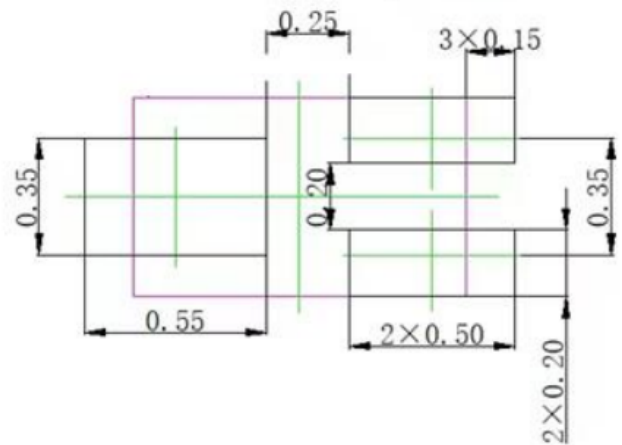
Figure 12. $R_{\theta JA}$ Transient Thermal Impedance

Package Information (FBP1006)



Outline dimensions in mm

Unit:mm	Min	Typ	Max
A	0.450	/	0.550
A1	0.010	/	0.100
D	0.950	/	1.050
E	0.550	/	0.650
D1	/	0.45 REF.	/
E1	/	0.45 REF.	/
b	0.270	/	0.370
b1	0.100	/	0.200
e	/	0.635 REF.	/
e1	0.300	/	0.400
L	0.200	/	0.300
L1	/	0.050 REF.	/
L2	0.270	/	0.370



Suggested Pad Layout (Unit:mm)
Land Pattern (Only for Reference)

Disclaimer

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