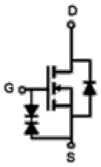
VPLMDF7172

N-Channel Enhancement Mode MOSFET

FBP1006

Symbol



Parameter	Value	Unit
V_{DS}	20	V
$R_{DS(ON)\text{-}Max}$	230	mΩ
I_D	1.4	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
VPLMDF7172	7172	FBP1006	Tape & Reel

Absolute Maximum Ratings (Tj = 25°C, unless otherwise specified)

Parameter		Symbol	Rating	Unit
Drain-Source Voltage		V_{DS}	20	V
Gate-Source Voltage		V_{GS}	±8	V
Maximum Junction Temperature		T_J	150	°C
Storage Temperature Range		T_{STG}	-55 to 150	°C
Pulse Drain Current Tested	T_A=25°C	I_{DM} (1)	3.5	A
Continuous Drain Current	T_A=25°C	I_D	1.4	A
	T_A=70°C		1.1	
Maximum Power Dissipation	T_A=25°C	P_D	0.7	W
	T_A=70°C		0.4	

Thermal Characteristics

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

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

Electrical Characteristics (Tj = 25°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}=250uA
Zero Gate Voltage Drain Current	I_{DSS}	-	-	1	uA	V_{DS}=16V, V_{GS}=0V
Gate Threshold Voltage	$V_{GS(th)}$	0.5	-	1	V	V_{DS}=V_{GS}, I_{DS}=250uA
Gate Leakage Current	I_{GSS}	-	-	±10	uA	V_{GS}=±8V, V_{DS}=0V
Drain-Source On-state Resistance	$R_{DS(ON)}$ (3)	-	190	230	mΩ	V_{GS}=4.5V, I_{DS}=0.55A
		-	234	305		V_{GS}=2.5V, I_{DS}=0.45A
		-	303	455		V_{GS}=1.8V, I_{DS}=0.35A
Forward Transconductance	g_{fs}	-	1.7	-	S	V_{DS}=5V, I_{DS}=0.55A

Dynamic Characteristics(4)

Parameter	Symbol	Min.	Typ.	Max.	Unit	Test Conditions
Input Capacitance	C_{iss}	-	43	-	pF	V_{GS}=0V, V_{DS}=10V, Freq.=1MHz
Output Capacitance	C_{oss}	-	9	-		
Reverse Transfer Capacitance	C_{rss}	-	6	-		
Turn-on Delay Time	$t_{d(ON)}$	-	1.2	-	nS	V_{GS}=4.5V,V_{DS}=10V, I_D=2A,R_{GEN}=6Ω
Turn-on Rise Time	t_r	-	25	-		
Turn-off Delay Time	$t_{d(OFF)}$	-	14	-		
Turn-off Fall Time	t_f	-	15	-		

Gate Charge Characteristics

Parameter	Symbol	Min.	Typ.	Max.	Unit	Test Conditions
Total Gate Charge	Q_g	-	1.1	-	nC	V_{GS}=2.5V,V_{DS}=10V, I_D=1A
		-	2	-		V_{GS}=4.5V,V_{DS}=10V, I_D=1A
Gate-Source Charge	Q_{gs}	-	0.3	-		
Gate-Drain Charge	Q_{gd}	-	0.3	-		

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}=0.35A, V_{GS}=0V
Reverse Recovery Time	t_{rr}	-	9	-	nS	I_F=1A, V_R=0V & dI_F/dt=100A/μs
Reverse Recovery Charge	Q_{rr}	-	1	-	nC	

- (3) Pulse test (pulse width ≤ 300us, duty cycle ≤ 2%).
- (4) Guaranteed by design, not subject to production testing.

Electrical Characteristic Diagrams

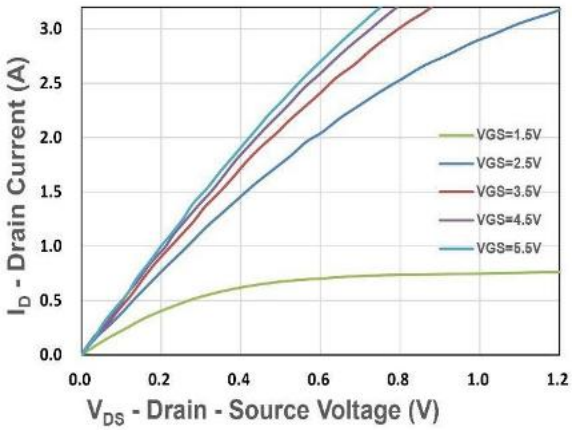


Figure 1. Output Characteristics

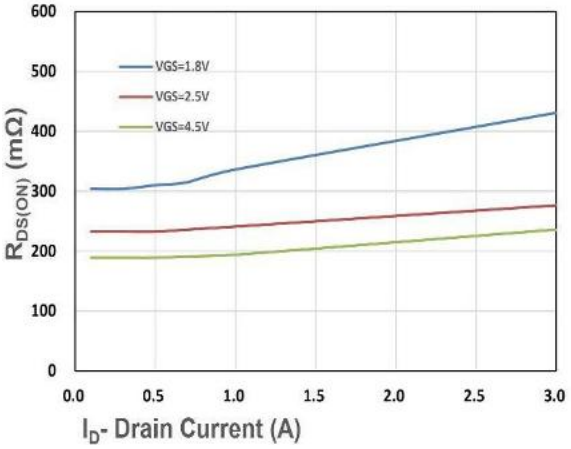


Figure 2. On-Resistance vs. ID

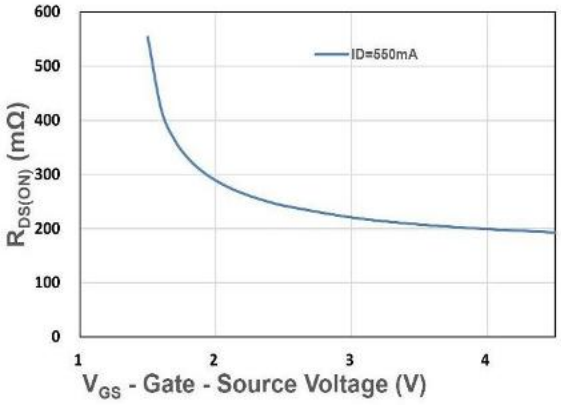


Figure 3. On-Resistance vs. VGS

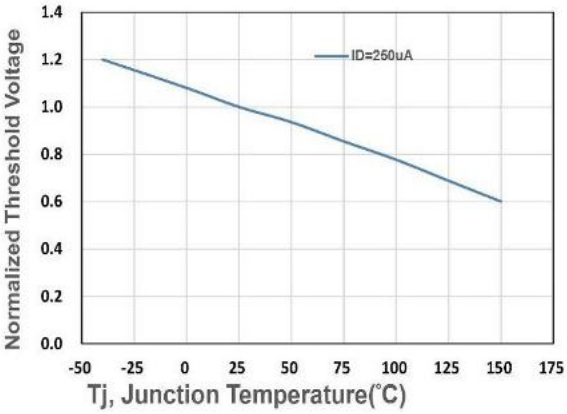


Figure 4. Gate Threshold Voltage

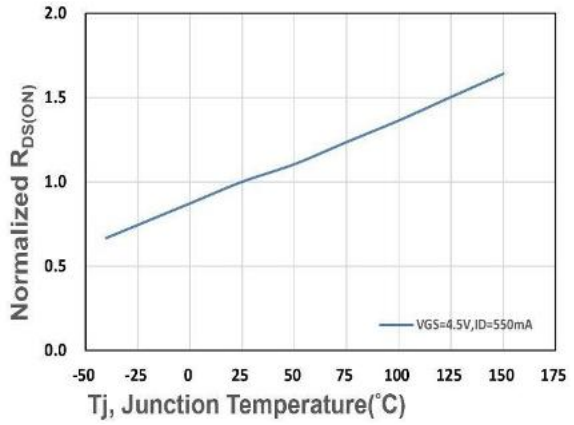


Figure 5. Drain-Source On Resistance

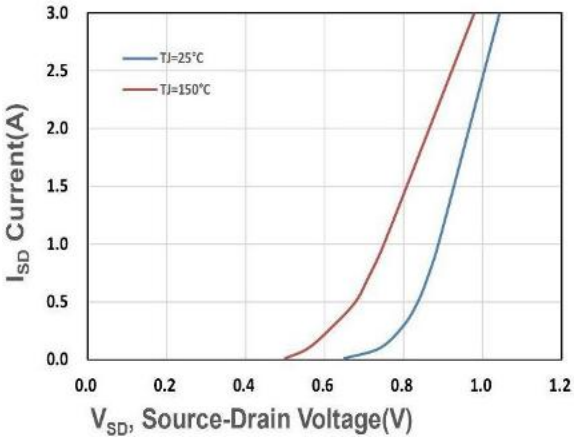


Figure 6. Source-Drain Diode Forward

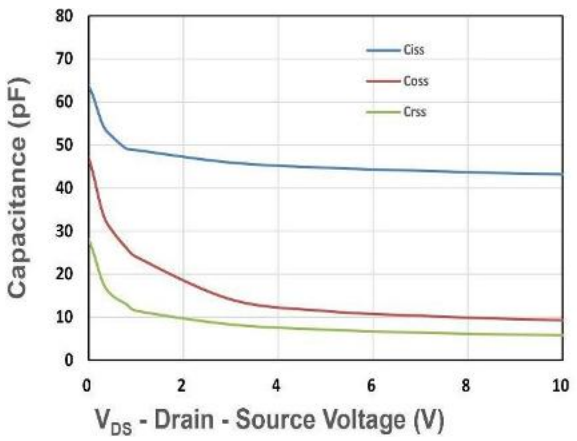


Figure 7. Capacitance

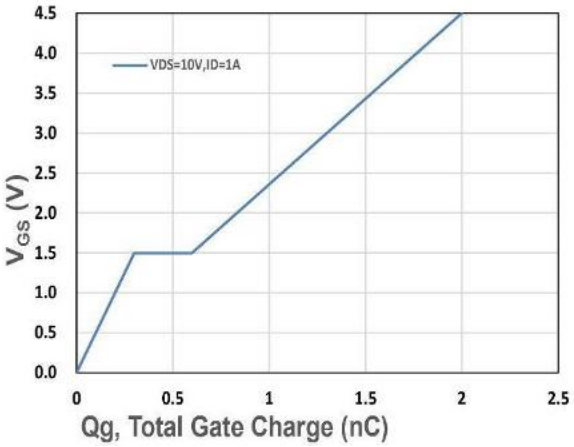


Figure 8. Gate Charge Characteristics

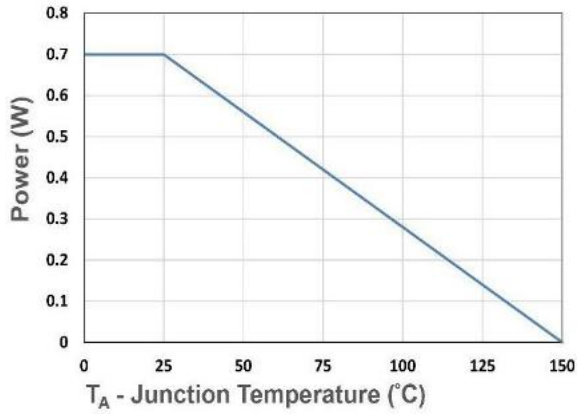


Figure 9. Power Dissipation

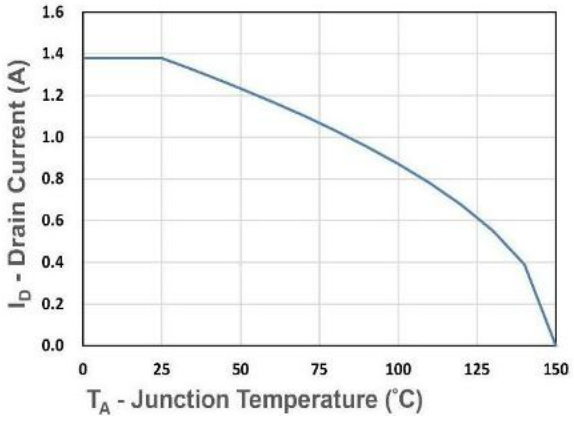


Figure 10. Drain Current

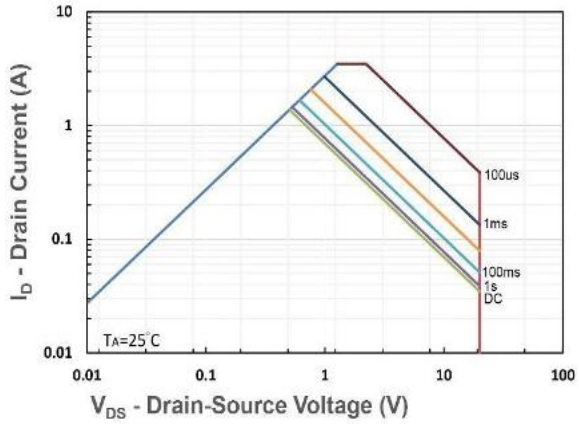


Figure 11. Safe Operating Area

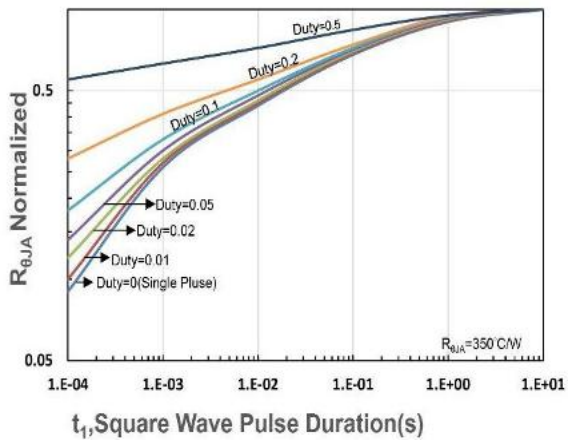
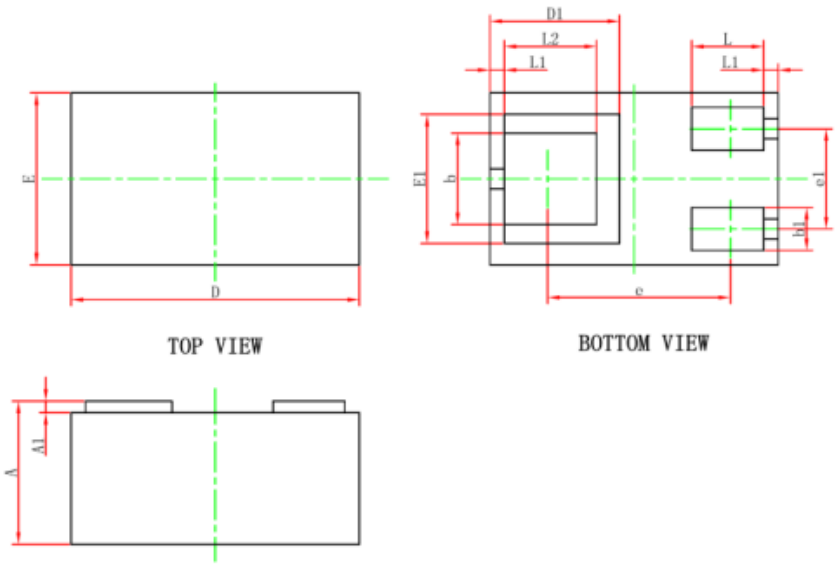


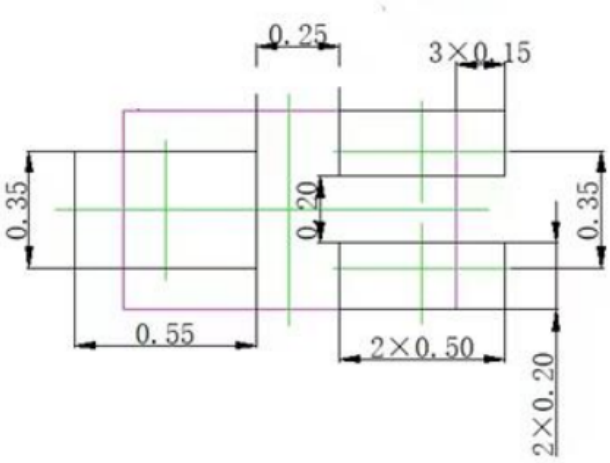
Figure 12. $R_{\theta JA}$ Transient Thermal Impedance

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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