



TM15P018BF6

P-Channel Enhancement Mosfet

General Description

- Low $R_{DS(ON)}$
- RoHS and Halogen-Free Compliant

Applications

- Load switch
- PWM

General Features

$V_{DS} = -18V$ $I_D = -15A$

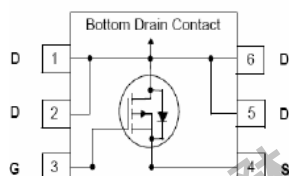
$R_{DS(ON)} = 13 m\Omega (typ.) @ V_{GS} = -4.5V$

100% UIS Tested

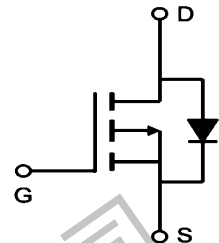
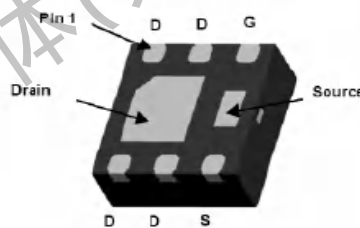
100% R_g Tested



BF6: PDFN2*2-6L



Marking: 1212



Absolute Maximum Ratings ($T_C = 25^\circ C$ unless otherwise noted)

Symbol	Parameter	Rating	Units
V_{DS}	Drain-Source Voltage	-18	V
V_{GS}	Gate-Source Voltage	± 12	V
$I_D @ T_A = 25^\circ C$	Continuous Drain Current, $V_{GS} @ -4.5V^1$	-15	A
$I_D @ T_A = 70^\circ C$	Continuous Drain Current, $V_{GS} @ -4.5V^1$	-9.6	A
I_{DM}	Pulsed Drain Current ²	-40	A
$P_D @ T_A = 25^\circ C$	Total Power Dissipation ³	1.9	W
T_{STG}	Storage Temperature Range	-55 to 175	$^\circ C$
T_J	Operating Junction Temperature Range	-55 to 175	$^\circ C$

Thermal Data

Symbol	Parameter	Typ.	Max.	Unit
$R_{\theta JA}$	Thermal Resistance Junction-ambient ¹	---	65	$^\circ C/W$
$R_{\theta JC}$	Thermal Resistance Junction-Case ¹	---	80	$^\circ C/W$

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

Symbol	Parameter	Test Condition	Min.	Typ.	Max.	Units
Off Characteristic						
$V_{(BR)DSS}$	Drain-Source Breakdown Voltage	$V_{GS}=0V, I_D= -250\mu A$	-18	-	-	V
I_{DSS}	Zero Gate Voltage Drain Current	$V_{DS}= -12V, V_{GS}=0V,$	-	-	-1	μA
I_{GSS}	Gate to Body Leakage Current	$V_{DS}=0V, V_{GS}= \pm 12V$	-	-	± 100	nA
On Characteristics						
$V_{GS(th)}$	Gate Threshold Voltage	$V_{DS}=V_{GS}, I_D= -250\mu A$	-0.4	-0.65	-1.0	V
$R_{DS(on)}$	Static Drain-Source on-Resistance note2	$V_{GS}= -4.5V, I_D= -7A$	-	13	16	m Ω
		$V_{GS}= -2.5V, I_D= -5A$	-	19	24	
Dynamic Characteristics						
C_{iss}	Input Capacitance	$V_{DS}= -6V, V_{GS}=0V,$ $f=1.0MHz$	-	1300	-	pF
C_{oss}	Output Capacitance		-	302	-	pF
C_{rss}	Reverse Transfer Capacitance		-	279	-	pF
Q_g	Total Gate Charge	$V_{DS}= -6V, I_D= -7A,$ $V_{GS}= -4.5V$	-	19	-	nC
Q_{gs}	Gate-Source Charge		-	4	-	nC
Q_{gd}	Gate-Drain(“Miller”) Charge		-	5	-	nC
Switching Characteristics						
$t_{d(on)}$	Turn-on Delay Time	$V_{DD}= -6V, I_D= -4A,$ $V_{GS}= -4.5V,$ $R_{GEN}=2.5\Omega$	-	11	-	ns
t_r	Turn-on Rise Time		-	36	-	ns
$t_{d(off)}$	Turn-off Delay Time		-	29	-	ns
t_f	Turn-off Fall Time		-	8	-	ns
Drain-Source Diode Characteristics and Maximum Ratings						
I_S	Maximum Continuous Drain to Source Diode Forward Current		-	-	-15	A
I_{SM}	Maximum Pulsed Drain to Source Diode Forward Current		-	-	-36.8	A
V_{SD}	Drain to Source Diode Forward Voltage	$V_{GS}=0V, I_S= -7A$	-	-0.8	-1.2	V

Notes: 1. Repetitive Rating: Pulse Width Limited by Maximum Junction Temperature

 2. Pulse Test: Pulse Width $\leq 300\mu s$, Duty Cycles $\leq 2\%$

Typical Performance Characteristics

Figure1: Output Characteristics

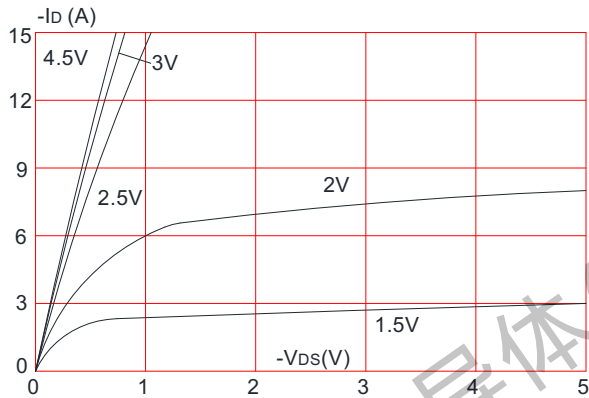


Figure 2: Typical Transfer Characteristics

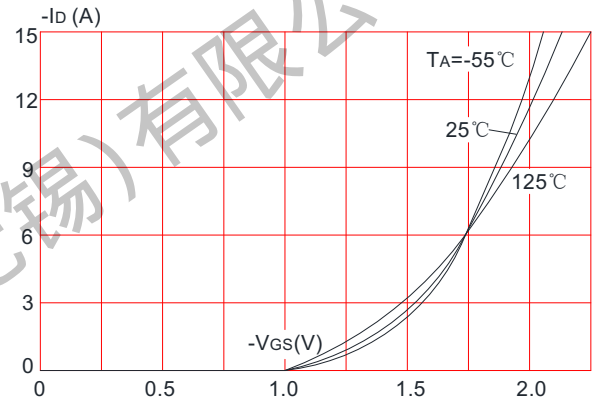


Figure 3: On-resistance vs. Drain Current

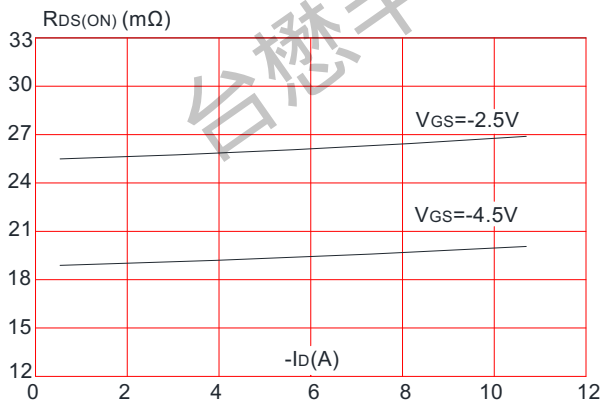


Figure 4: Body Diode Characteristics

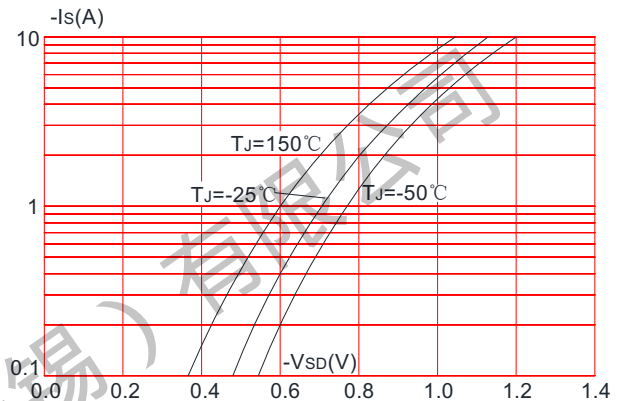


Figure 5: Gate Charge Characteristics

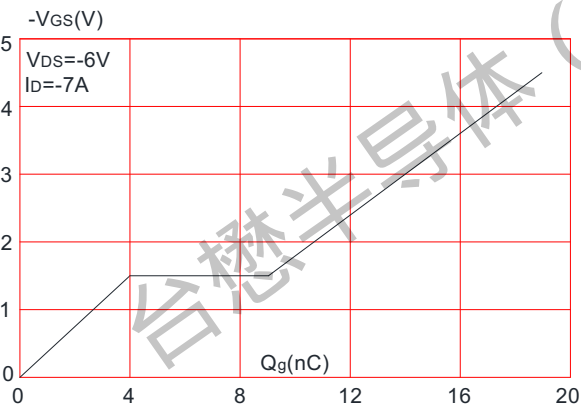
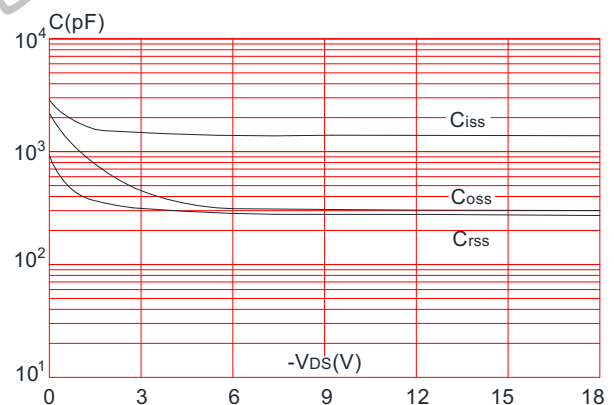


Figure 6: Capacitance Characteristics



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Figure 7: Normalized Breakdown Voltage vs. Junction Temperature

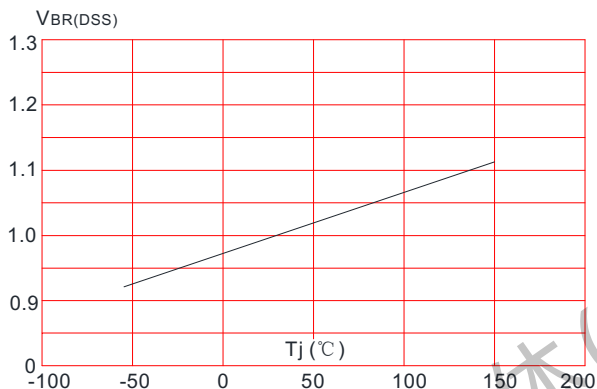


Figure 8: Normalized on Resistance vs. Junction Temperature

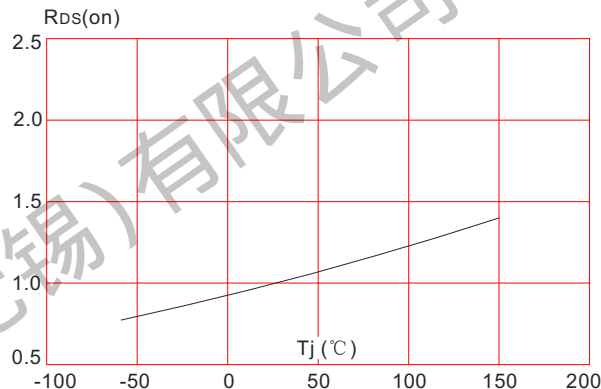


Figure 9: Maximum Safe Operating Area

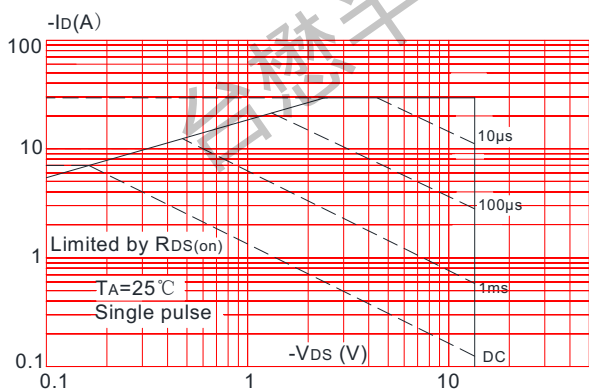


Figure 10: Maximum Continuous Drain Current vs. Ambient Temperature

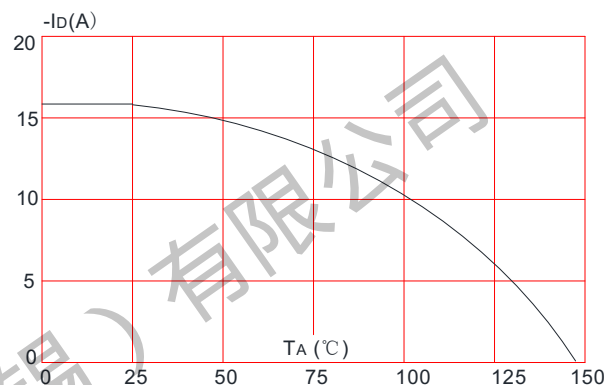
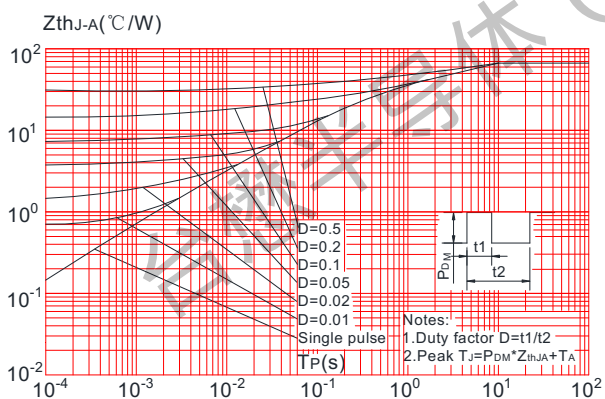


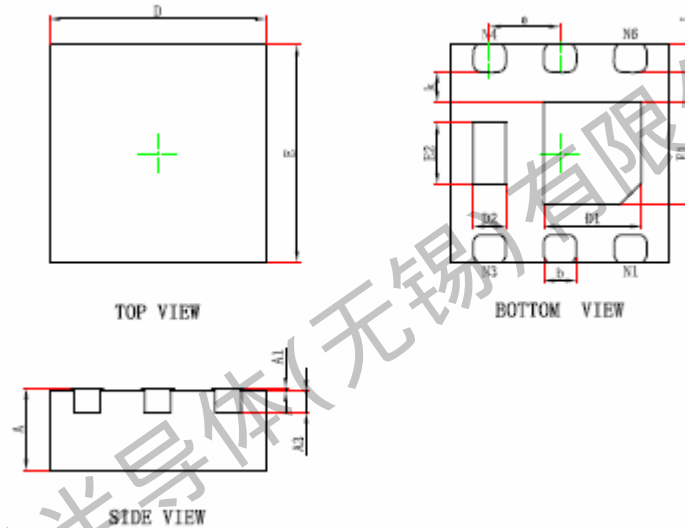
Figure.11: Maximum Effective Transient Thermal Impedance, Junction-to-Ambient



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Package Mechanical Data: PDFN2*2-6L



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	0.700	0.800	0.028	0.031
A1	0.000	0.050	0.000	0.002
A3	0.203REF.		0.008REF.	
D	1.924	2.076	0.076	0.082
E	1.924	2.076	0.076	0.082
D1	0.800	1.000	0.031	0.039
E1	0.850	1.050	0.033	0.041
D2	0.200	0.400	0.008	0.016
E2	0.460	0.660	0.018	0.026
k	0.200MIN.		0.008MIN.	
b	0.250	0.350	0.010	0.014
e	0.650TYP.		0.026TYP.	
L	0.174	0.326	0.007	0.013

Notes

1. All dimensions are in millimeters.
2. Tolerance $\pm 0.10\text{mm}$ (4 mil) unless otherwise specified
3. Package body sizes exclude mold flash and gate burrs. Mold flash at the non-lead sides should be less than 5 mils.
4. Dimension L is measured in gauge plane.
5. Controlling dimension is millimeter, converted inch dimensions are not necessarily exact.

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Revision history:

Date	Rev	Description	Page
2023.05.14	23.05	Original	