TM15N04BF6

N-Channel Enhancement Mosfet

General Description

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

Applications

- Load switch
- PWM

General Features

V_{DS} =40V I_D =15 A

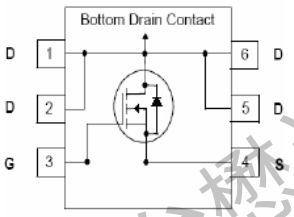
$R_{DS(ON)}$ =11 mΩ(typ.) @ V_{GS} =10V

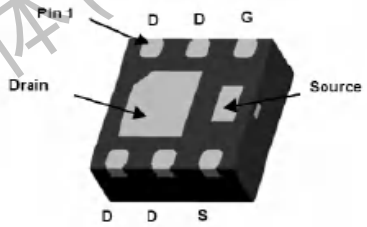
100% UIS Tested

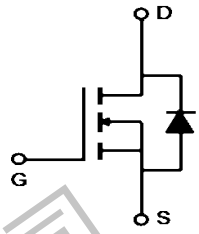
100% R_g Tested

Green Product

BF6: PDFN2*2-6L







Marking: 13R04M

Absolute Maximum Ratings (T_C=25℃ unless otherwise noted)

Symbol	Parameter	Rating	Units
V_{DS}	Drain-Source Voltage	40	V
V_{GS}	Gate-Source Voltage	±20	V
I_D@T_A=25℃	Continuous Drain Current, V_{GS} @ 10V[1]	15	A
I_D@T_A=70℃	Continuous Drain Current, V_{GS} @ 10V[1]	9	A
I_{DM}	Pulsed Drain Current[2]	37.5	A
P_D@T_A=25℃	Total Power Dissipation[3]	26	W
E_{AS}	Single pulse avalanche energy[2]	29	mJ
T_{STG}	Storage Temperature Range	-55 to 150	℃
T_J	Operating Junction Temperature Range	-55 to 150	℃

Thermal Data

Symbol	Parameter	Typ.	Max.	Unit
$R_{\theta JC}$	Thermal Resistance Junction-Case[1]	---	4.8	℃/W

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Electrical Characteristics: (T_A=25℃ unless otherwise noted)

Symbol	Parameter	Conditions	Min	Typ	Max	Units
Off Characteristics						
BV_{DSS}	Drain-Sourtce Breakdown Voltage	V_{GS}=0V,I_D=250μA	40	---	---	V
I_{DSS}	Drain-Source Leakage Current	V_{GS}=0V, V_{DS}=40V	---	---	1	μA
I_{GSS}	Gate-Source Leakage Current	V_{GS}=±20V, V_{DS}=0A	---	---	±100	nA
On Characteristics						
$V_{GS(th)}$	GATE-Source Threshold Voltage	V_{GS}=V_{DS}, I_D=250μA	1.2	1.6	2.0	V
$R_{DS(ON)}$	Drain-Source On Resistance[2]	V_{GS}=10V,I_D=4A	---	11	13	mΩ
		V_{GS}=4.5V,I_D=3A	---	17	22	
Dynamic Characteristics						
C_{iss}	Input Capacitance	V_{DS}=20V, V_{GS}=0V, f=1MHz	---	407	---	pF
C_{oss}	Output Capacitance		---	196	---	
C_{rss}	Reverse Transfer Capacitance		---	7.7	---	
Switching Characteristics						
$t_{d(on)}$	Turn-On Delay Time	V_{DD}=20V , V_{GS}=10V , R_G=3.3Ω ,I_D=1A	---	7	---	ns
t_r	Rise Time		---	11	---	ns
$t_{d(off)}$	Turn-Off Delay Time		---	24	---	ns
t_f	Fall Time		---	17	---	ns
Q_g	Total Gate Charge	V_{DS}=20V , V_{GS}=10V , I_D=15A	---	6.9	---	nC
Q_{gs}	Gate-Source Charge		---	1.3	---	nC
Q_{gd}	Gate-Drain “Miller” Charge		---	3	---	nC
Drain-Source Diode Characteristics						
I_{SD}	Source drain current(Body Diode)	T_A=25℃	---	---	2	A
V_{SD}	Source-Drain Diode Forward Voltage	V_{GS}=0V , I_{SD}=4A,T_J=25℃	---	0.84	1.2	V

Notes:

1. Pulse width limited by maximum allowable junction temperature

2.Pulse test ; Pulse width≤300μs, duty cycle≤2%.

Typical Characteristics

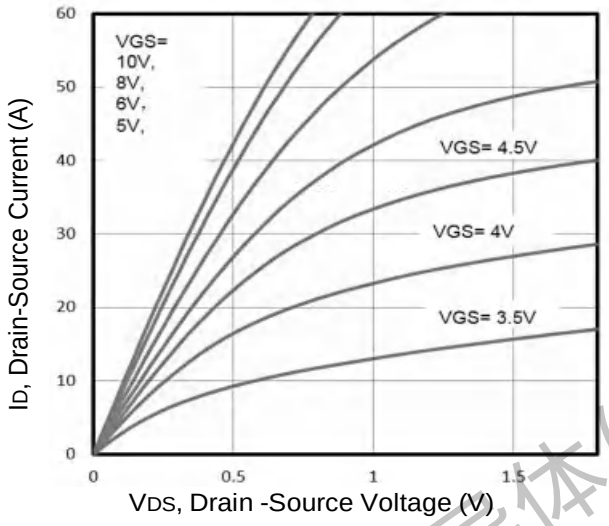


Fig1. Typical Output Characteristics

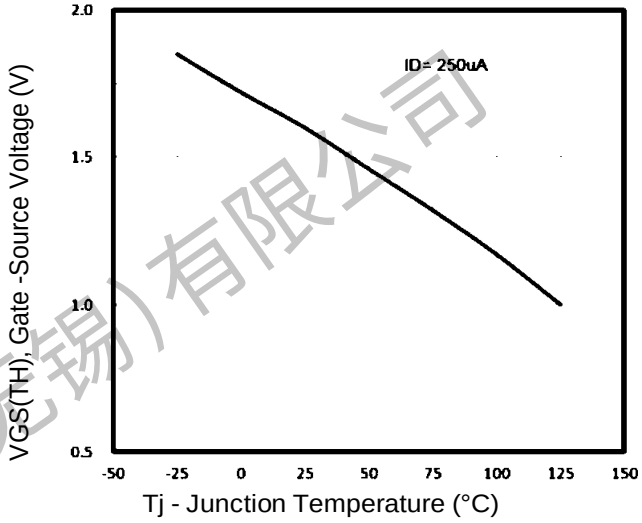


Fig2. Normalized Threshold Voltage Vs. Temperature

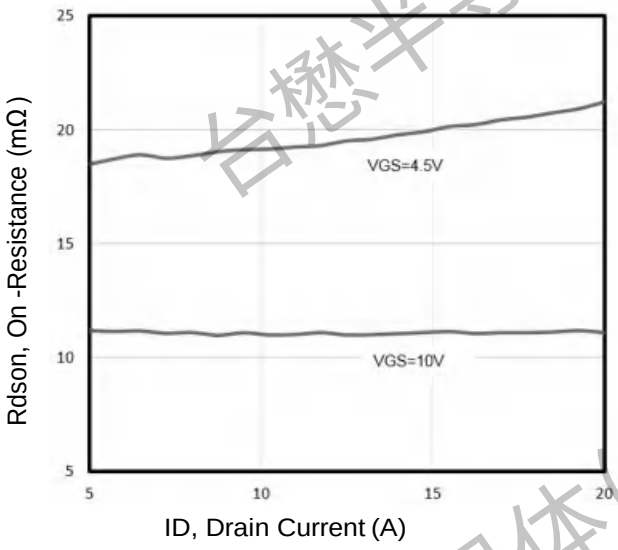


Fig3. On-Resistance vs. Drain Current and Gate

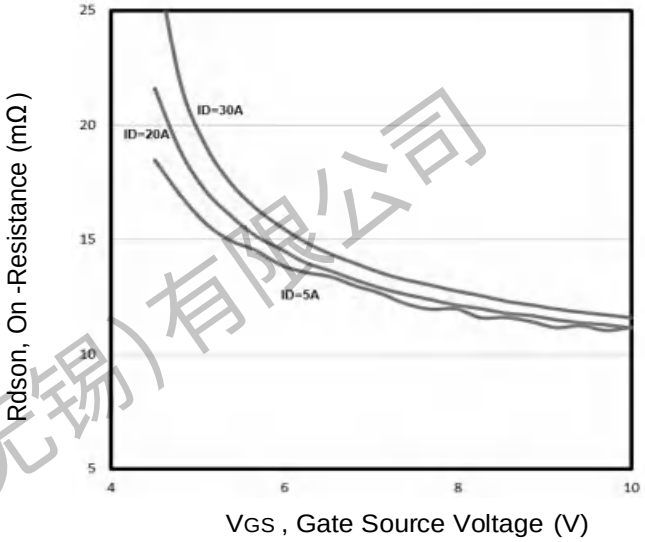


Fig4. On-Resistance vs. Gate Source Voltage

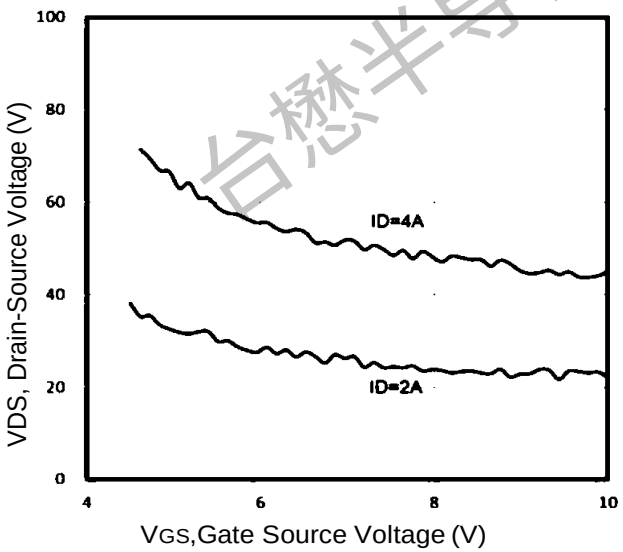


Fig5. Drain-Source Voltage vs Gate-Source Voltage

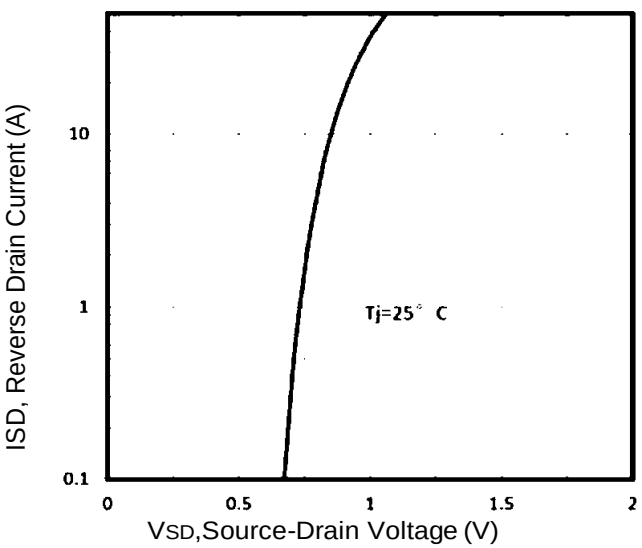


Fig6. Typical Source-Drain Diode Forward Voltage

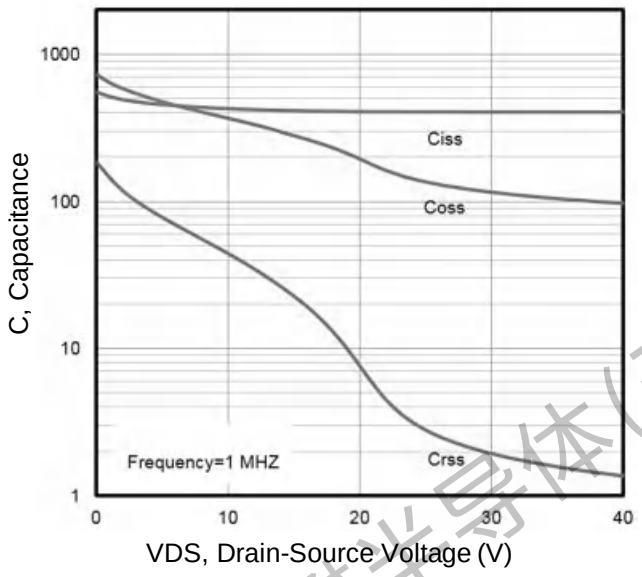


Fig7. Typical Capacitance Vs. Drain-Source Voltage

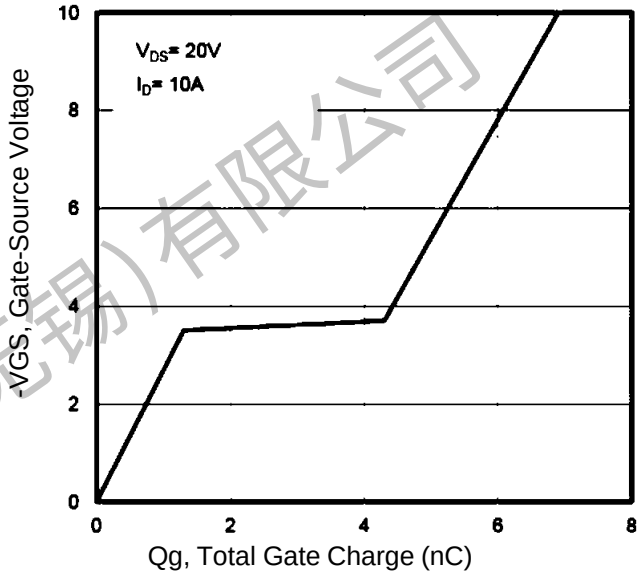
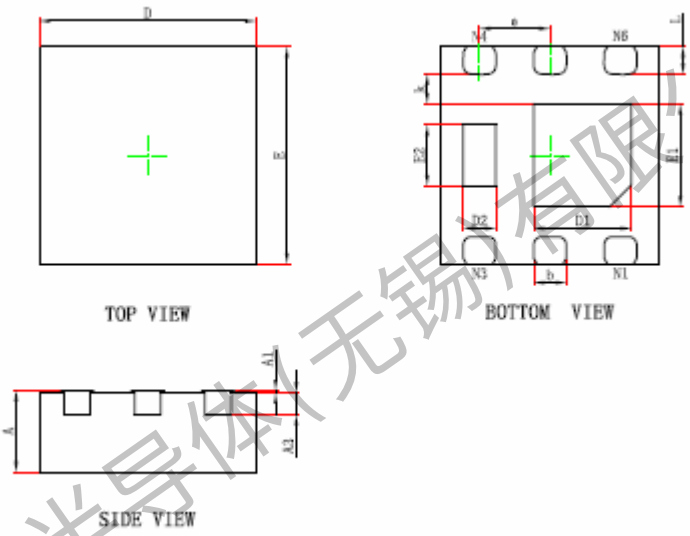


Fig8. Typical Gate Charge Vs. Gate-Source Voltage

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 ±0.10mm (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
2023.06.21	23.06	Original	