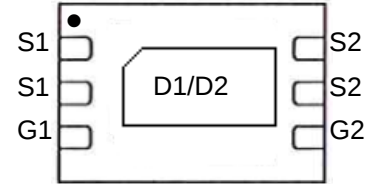


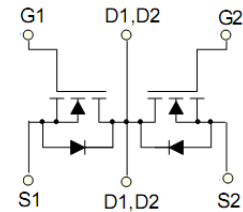
Dual N-Channel MOSFET

$V_{(BR)DSS}$	$R_{DS(on)}$ (TYP)	I_D Max
20V	0.012Ω @ 4.5V	9.0A
	0.015Ω @ 2.5V	

DFN-2x3-6L



Equivalent Circuit



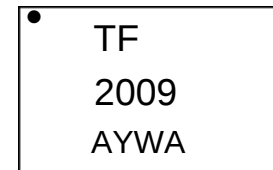
FEATURE

- TrenchFET Power MOSFET
- Excellent $R_{DS(on)}$
- Low Gate Charge
- High Power and Current Handling Capability
- Surface Mount Package

APPLICATION

- Battery Protection
- Load Switch
- Power Management

MARKING



Package Marking and Ordering Information

Part NO.	TFD120N02
Marking1	2009 : TFD120N02
Marking2	TF:tuofeng; AA:device code; Y:year code; W:Week
Basic ordering unit (pcs)	5000

ABSOLUTE MAXIMUM RATINGS ($T_a=25^\circ\text{C}$ unless otherwise noted)

Parameter	Symbol	Value	Unit
Drain-Source Voltage	V_{DS}	20	V
Gate-Source Voltage	V_{GS}	± 12	V
Continuous Drain Current	I_D	9.0	A
Pulsed Drain Current (note 1)	I_{DM}	30	A
Thermal Resistance from Junction to Ambient (note 2)	$R_{\theta JA}$	82	$^\circ\text{C/W}$
Junction Temperature	T_J	150	$^\circ\text{C}$
Storage Temperature	T_{STG}	-55~+150	$^\circ\text{C}$
Lead Temperature for Soldering Purposes(1/8" from case for 10 s)	T_L	260	$^\circ\text{C}$

MOSFET ELECTRICAL CHARACTERISTICS

T_a =25 °C unless otherwise specified

Parameter	Symbol	Test Condition	Min	Typ	Max	Unit
STATIC CHARACTERICTISCS						
Drain-source breakdown voltage	V _{(BR)DSS}	V _{GS} = 0V, I _D =250μA	20			V
Zero gate voltage drain current	I _{DSS}	V _{DS} =19V,V _{GS} = 0V			100	nA
Gate-body leakage current	I _{GSS}	V _{GS} =±12V, V _{DS} = 0V			±100	nA
Gate threshold voltage (note 3)	V _{GS(th)}	V _{DS} =V _{GS} , I _D =250μA	0.5	0.7	1.0	V
Drain-source on-resistance (note 3)	R _{DS(on)}	V _{GS} =4.5V, I _D =6.0A	9	12	15	mΩ
		V _{GS} =3.8V, I _D =5.0A	10	13	16	mΩ
		V _{GS} =2.5V, I _D =4.0A	11	15	18	mΩ
Forward tranconductance (note 3)	g _{FS}	V _{DS} =5V, I _D =4A		10		S
Diode forward voltage (note 3)	V _{SD}	I _S =1.50A, V _{GS} = 0V			1.0	V
DYNAMIC CHARACTERICTISCS (note4)						
Input Capacitance	C _{iss}	V _{DS} =10V,V _{GS} =0V,f =1MHz		615		pF
Output Capacitance	C _{oss}			150		pF
Reverse Transfer Capacitance	C _{rss}			120		pF
SWITCHING CHARACTERICTISCS (note 4)						
Turn-on delay time	t _{d(on)}	V _{GS} =4.5V, V _{DS} =10V, I _D =3A R _{GEN} =3Ω		7.2		ns
Turn-on rise time	t _r			13		ns
Turn-off delay time	t _{d(off)}			29		ns
Turn-off fall time	t _f			11		ns
Total Gate Charge	Q _g	V _{DS} =10V,V _{GS} =4.5V,I _D =6A		12		nC
Gate-Source Charge	Q _{gs}			1.2		nC
Gate-Drain Charge	Q _{gd}			3.0		nC

Notes :

- 1.Repetitive rating: Pluse width limited by maximum junction temperature
- 2.Surface Mounted on FR4 board, t≤10 sec.
3. Pulse test : Pulse width≤300μs, duty cycle≤2%.
4. Guaranteed by design, not subject to production.

TYPICAL ELECTRICAL AND THERMAL CHARACTERISTICS

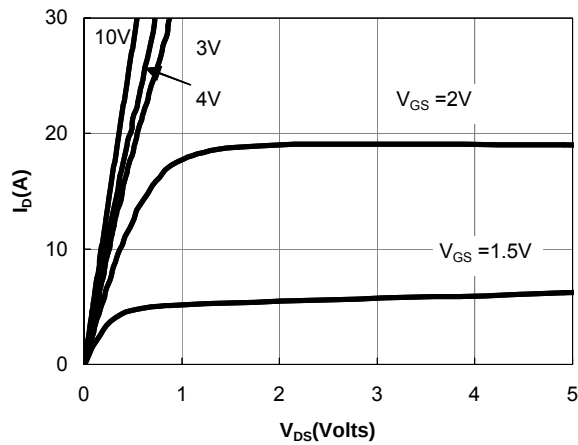


Figure 1: On-Regions Characteristic CS

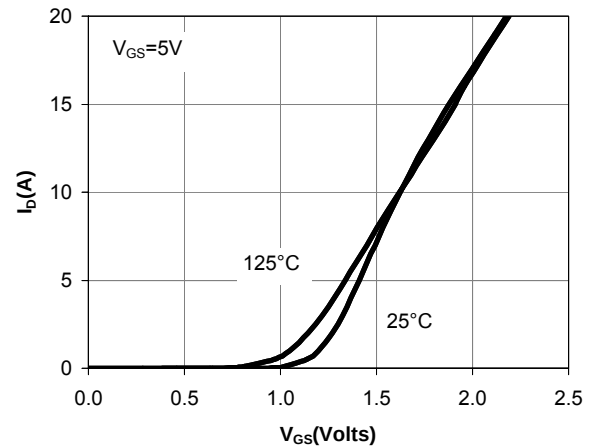


Figure 2: Transfer Characteristics

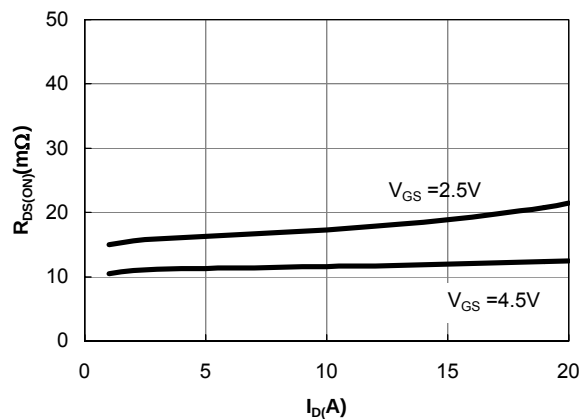


Figure 3: On-Resistance vs. Drain Current and Gate Voltage

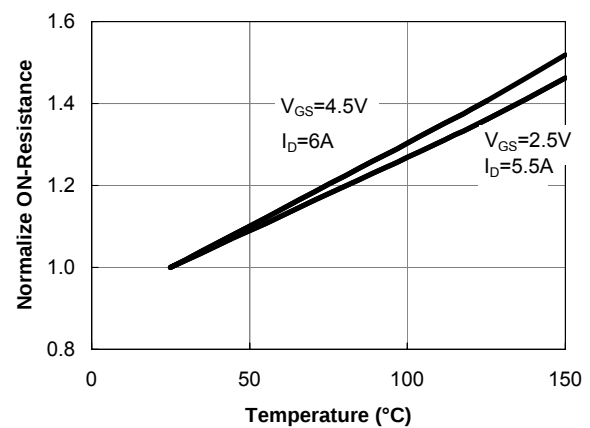


Figure 4: On-Resistance vs. Junction Temperature

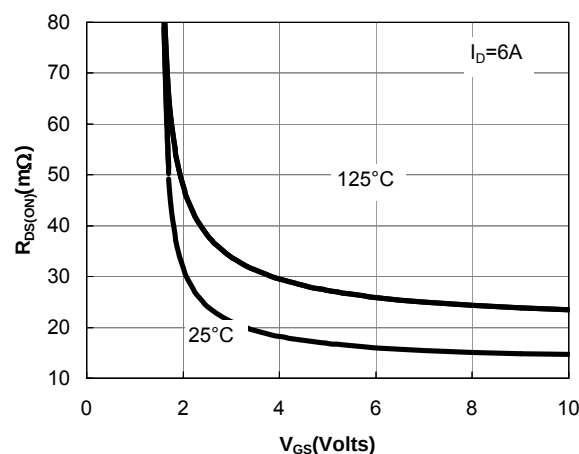


Figure 5: On-Resistance vs. Gate-Source Voltage

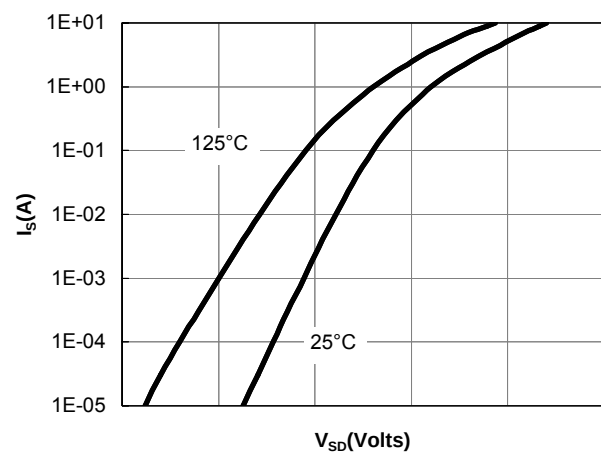
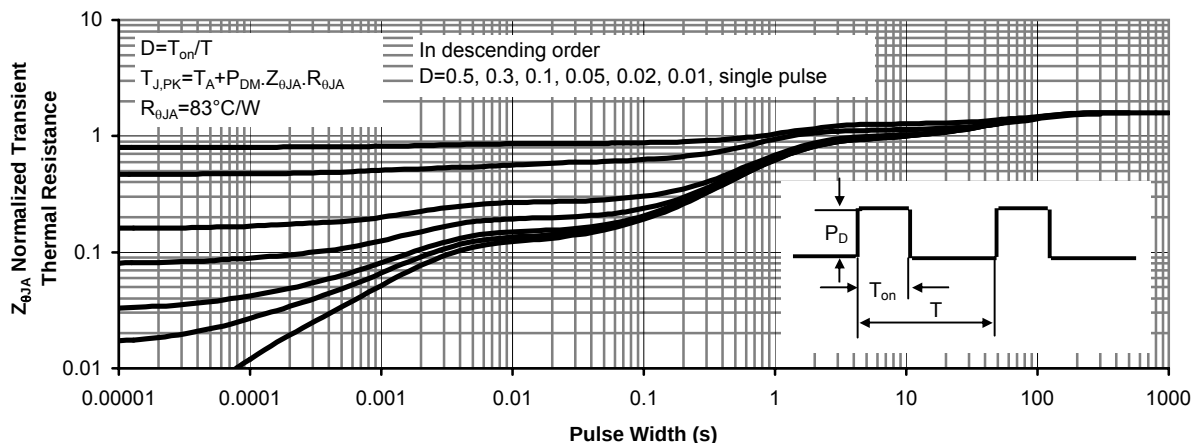
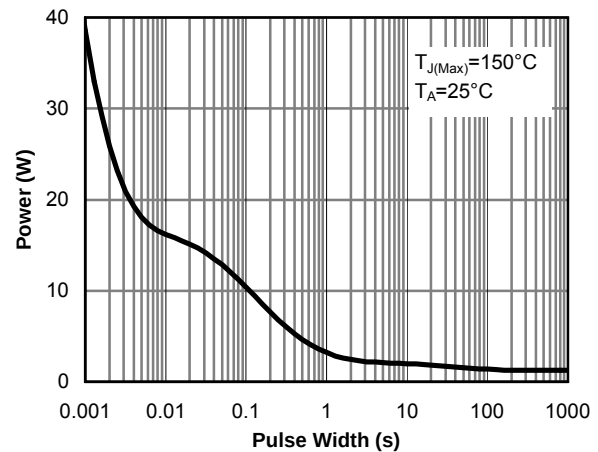
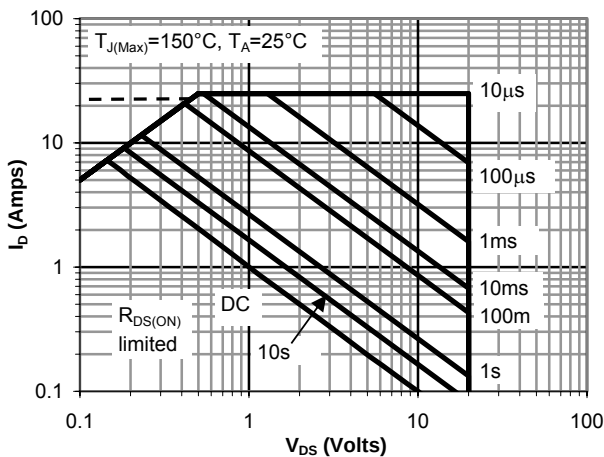
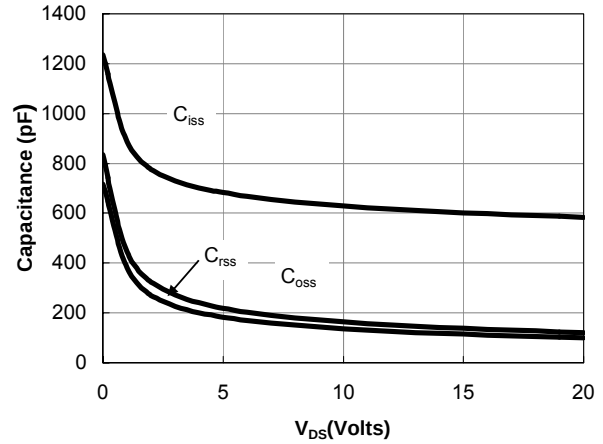
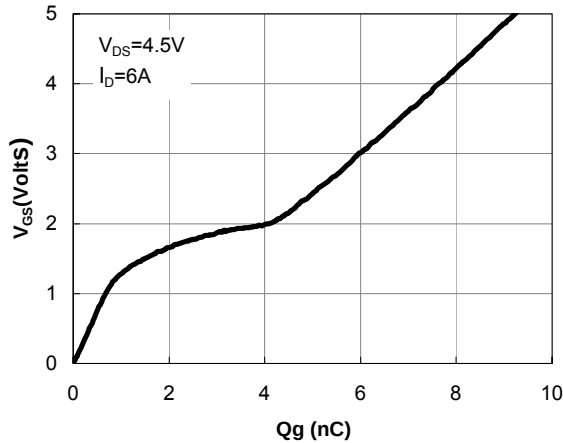
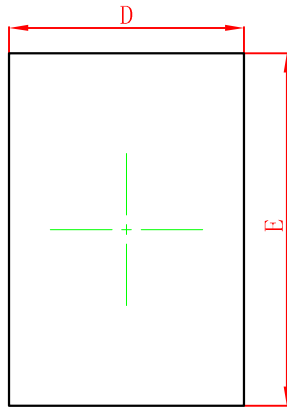


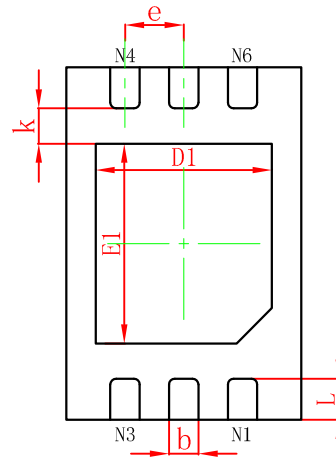
Figure 6: Body-Diode Characteristics

TYPICAL ELECTRICAL AND THERMAL CHARACTERISTICS

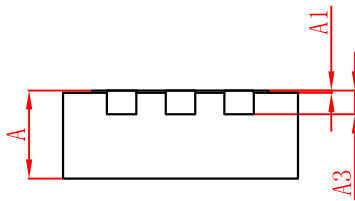




TOP VIEW



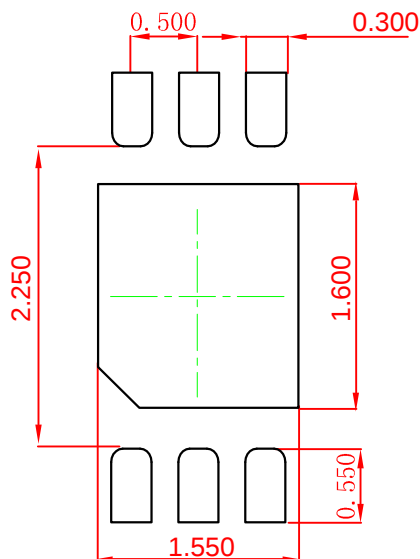
BOTTOM VIEW



SIDE VIEW

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	1.950	2.050	0.077	0.081
E	2.950	3.050	0.116	0.120
D1	1.450	1.550	0.057	0.061
E1	1.650	1.750	0.065	0.069
k	0.200MIN.		0.008MIN.	
b	0.200	0.300	0.008	0.012
e	0.500TYP.		0.020TYP.	
L	0.300	0.400	0.012	0.016

DFNWB2×3-6L 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.