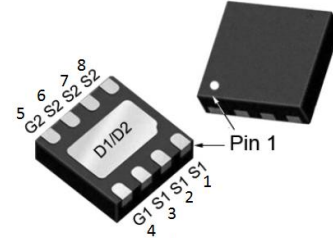


TFD030N02M Dual N-Channel MOSFET

$V_{(BR)DSS}$	$R_{DS(on)}$ TYP	I_D Max
19V	3.2mΩ @ 4.5V	23A
	4.0mΩ @ 2.5V	

DFN3x3-8L



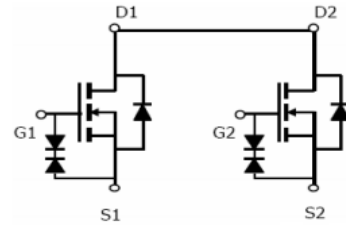
FEATURE

- TrenchFET Power MOSFET
- Excellent $R_{DS(on)}$
- Low Gate Charge
- High Power and Current Handling Capability
- Surface Mount Package
- ESD Rating: 2000V HBM

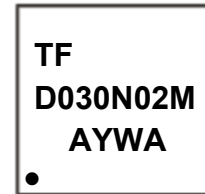
APPLICATION

- Battery Protection
- Load Switch
- Power Management

Equivalent Circuit



MARKING



Y:year code W:week code AA:device code

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

Parameter	Symbol	Value	Unit
Drain-Source Voltage	V_{DS}	19	V
Gate-Source Voltage	V_{GS}	± 12	V
Continuous Drain Current	I_D	23	A
Pulsed Drain Current (note 1)	I_{DM}	85	A
Thermal Resistance from Junction to Ambient (note 2)	$R_{\theta JA}$	32	$^\circ\text{C/W}$
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

$T_j=25\text{ }^{\circ}\text{C}$ 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	19	20		V
Zero gate voltage drain current	I _{DSS}	V _{DS} =19V,V _{GS} = 0V			1	uA
Gate-body leakage current	I _{GSS}	V _{GS} =±10V, V _{DS} = 0V			±10	uA
Gate threshold voltage (note 3)	V _{GS(th)}	V _{DS} =V _{GS} , I _D =250μA	0.45	0.70	1.00	V
Drain-source on-resistance (note 3)	R _{DS(on)}	V _{GS} =4.5V, I _D =8.0A	-	3.2	4.3	mΩ
		V _{GS} =3.6V, I _D =7.0A	-	3.4	4.5	mΩ
		V _{GS} =2.5V, I _D =6.0A	-	4.0	5.5	mΩ
Forward tranconductance (note 3)	g _{FS}	V _{DS} =5V, I _D =5.0A	45			S
Diode forward voltage (note 3)	V _{SD}	I _S =3.0A, V _{GS} = 0V			1.0	V
DYNAMIC CHARACTERICTISCS (note4)						
Input Capacitance	C _{iss}	V _{DS} =10V,V _{GS} =0V,f =1MHz		2360		pF
Output Capacitance	C _{oss}			282		pF
Reverse Transfer Capacitance	C _{rss}			178		pF
SWITCHING CHARACTERICTISCS (note 4)						
Turn-on delay time	t _{d(on)}	V _{GS} =4.5V, V _{DS} =10V, I _D =6.0A R _{GEN} =3Ω		12.5		ns
Turn-on rise time	t _r			31.2		ns
Turn-off delay time	t _{d(off)}			45.6		ns
Turn-off fall time	t _f			10.8		ns
Total Gate Charge	Q _g	V _{DS} =10V,V _{GS} =4.5V,I _D =6.0A		27.5		nC
Gate-Source Charge	Q _{gs}			3.2		nC
Gate-Drain Charge	Q _{gd}			5.9		nC

Notes :

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

TYPICAL ELECTRICAL AND THERMAL CHARACTERISTICS

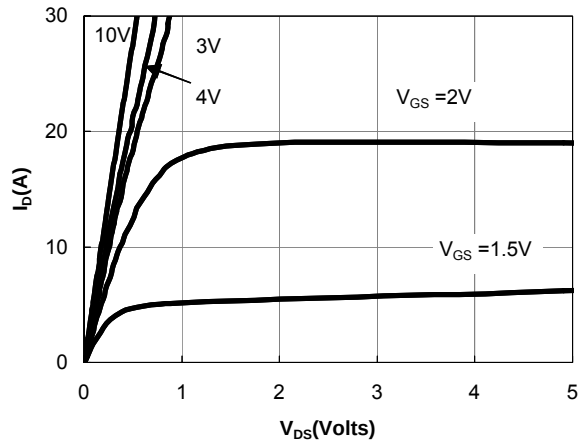


Figure 1: On-Regions Characteristic CS

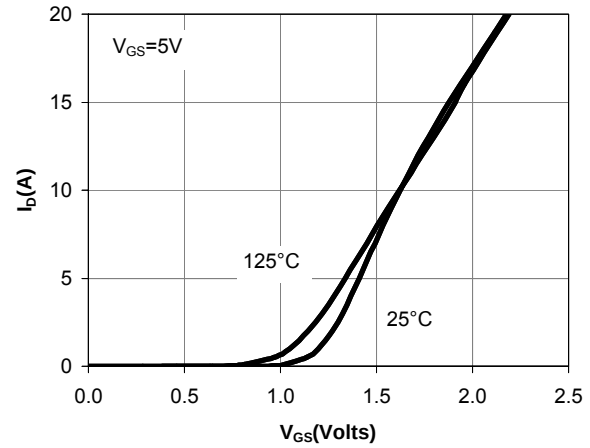


Figure 2: Transfer Characteristics

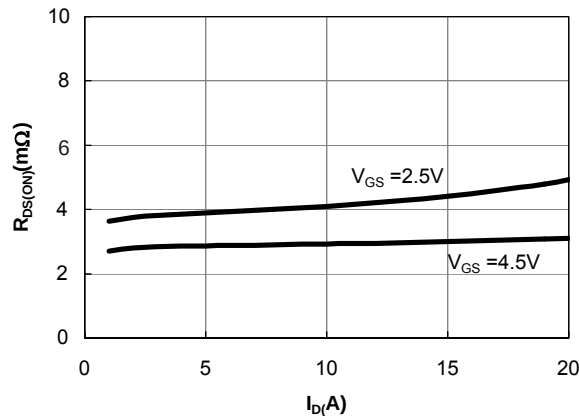


Figure 3: On-Resistance vs. Drain Current and Gate Voltage

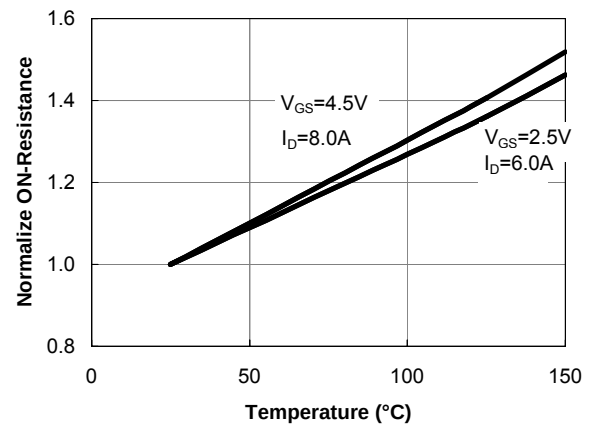


Figure 4: On-Resistance vs. Junction Temperature

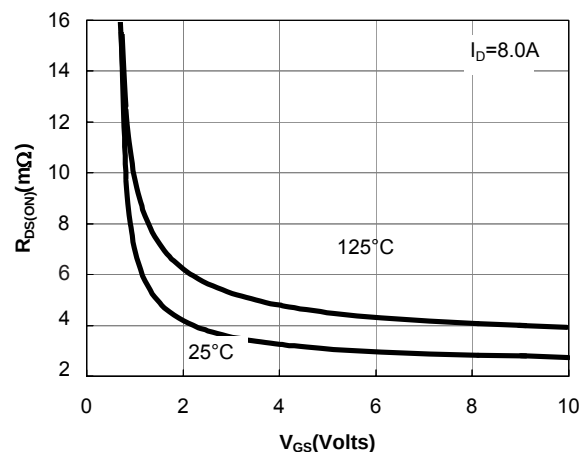


Figure 5: On-Resistance vs. Gate-Source Voltage

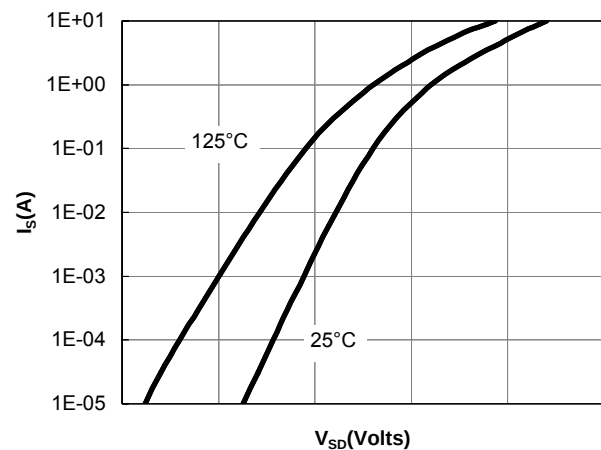
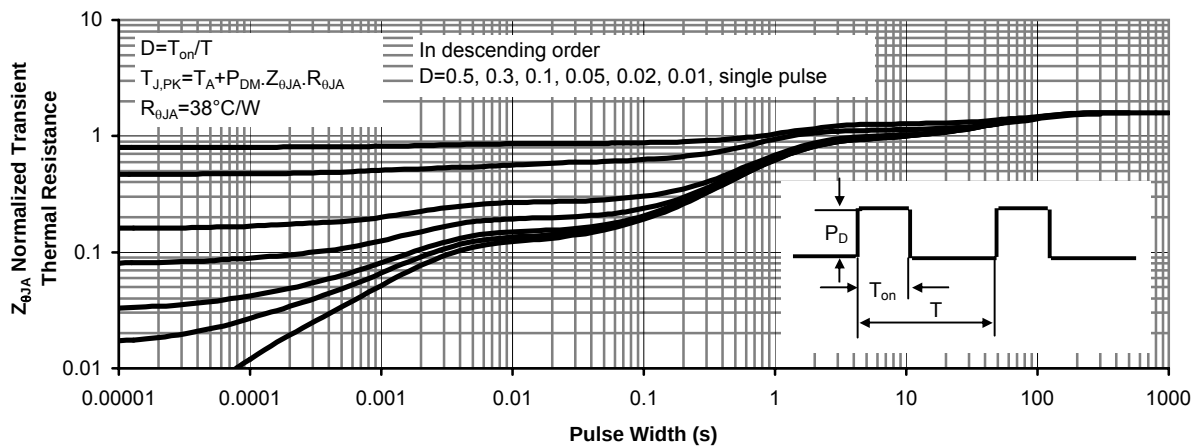
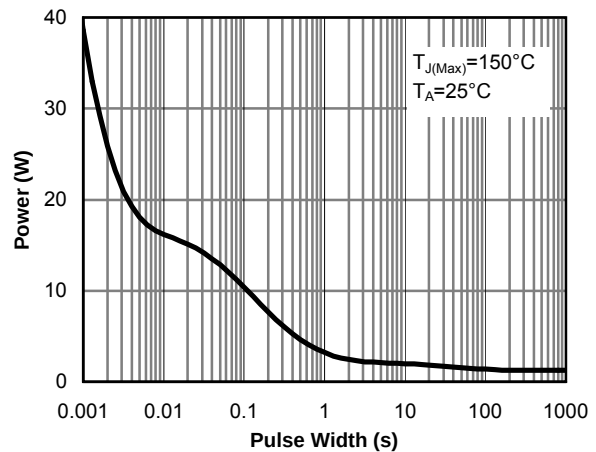
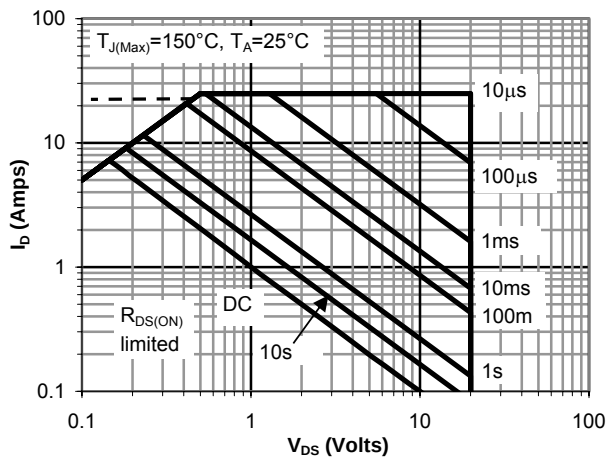
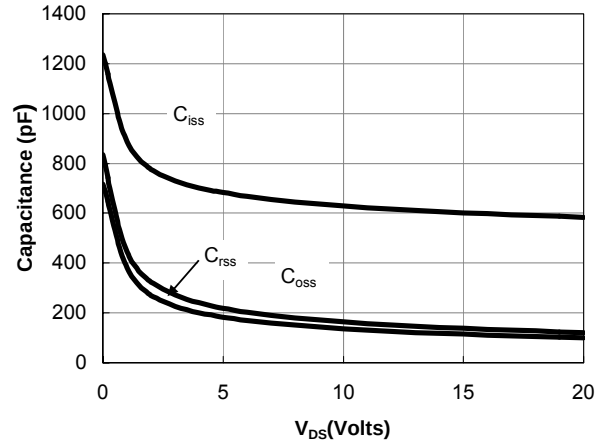
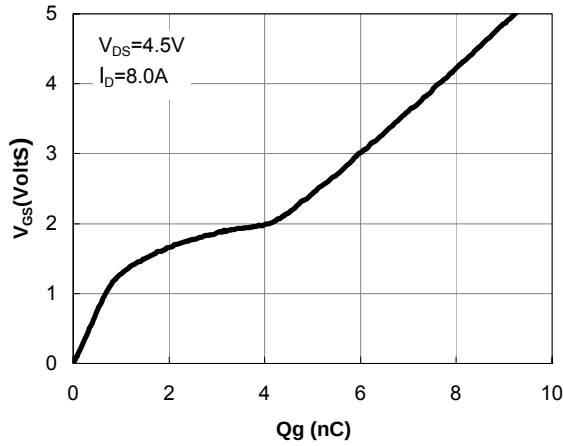
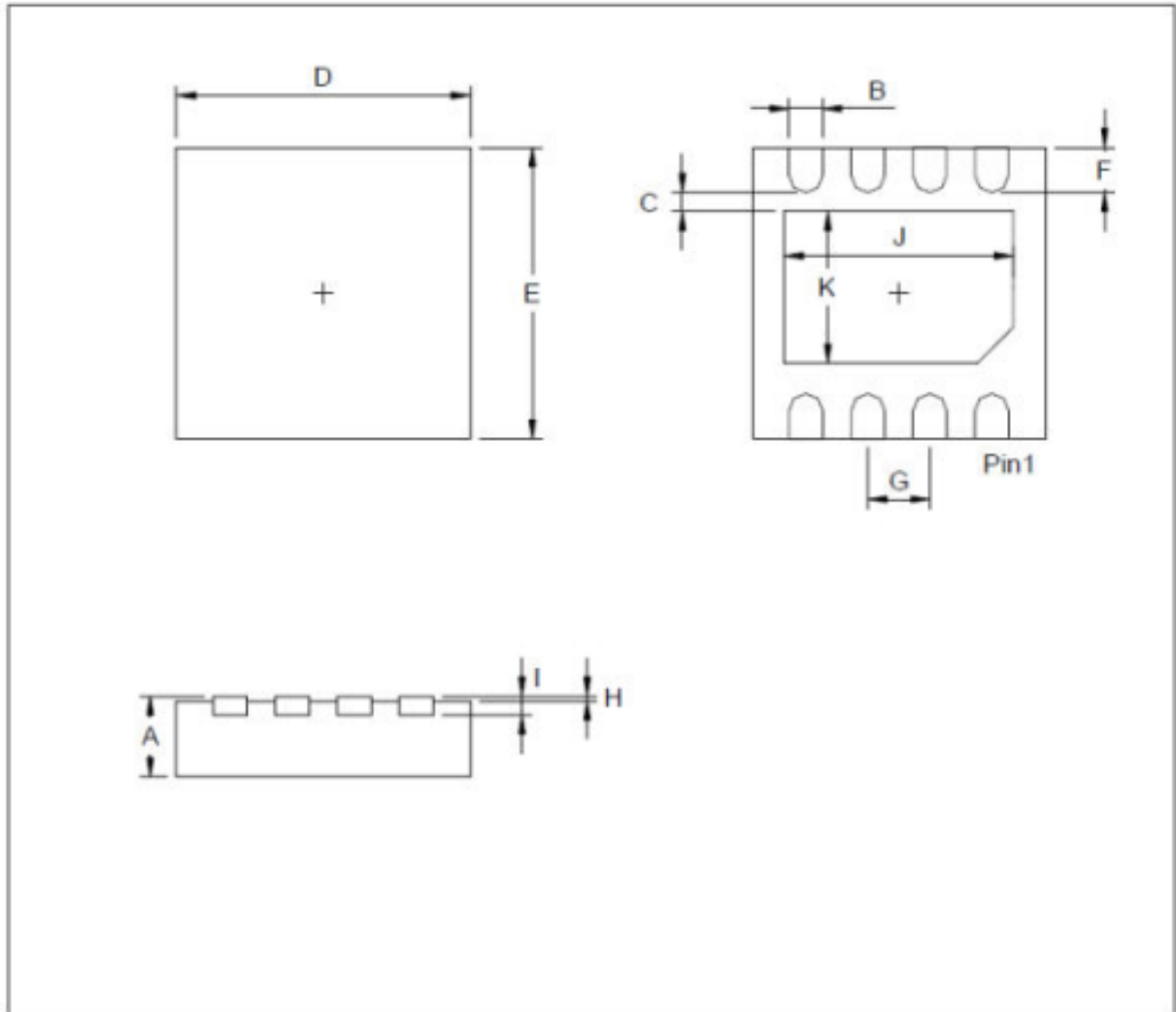


Figure 6: Body-Diode Characteristics

TYPICAL ELECTRICAL AND THERMAL CHARACTERISTICS



DFN3×3 Package Outline Data



Dimension	mm			Dimension	mm		
	Min.	Typ.	Max.		Min.	Typ.	Max.
A	0.7		0.8	I		0.203	
B	0.25		0.35	J	2.2		2.4
C	0.2			K	1.4		1.6
D	2.924		3.076				
E	2.924		3.076				
F	0.324		0.476				
G		0.65					
H	0		0.05				