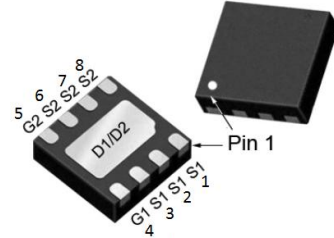


TFD040N02M Dual N-Channel MOSFET

$V_{(BR)DSS}$	$R_{DS(on)}$ TYP	I_D Max
20V	4.3mΩ @ 4.5V	19A
	6.0mΩ @ 2.5V	

DFN3030-8L



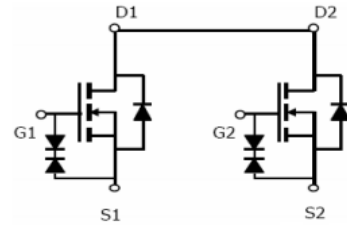
FEATURE

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

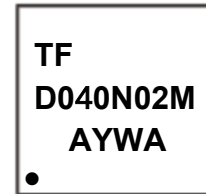
APPLICATION

- 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}	20	V
Gate-Source Voltage	V_{GS}	± 12	V
Continuous Drain Current	I_D	19	A
Pulsed Drain Current (note 1)	I_{DM}	65	A
Thermal Resistance from Junction to Ambient (note 2)	$R_{\theta JA}$	55	$^\circ\text{C/W}$
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

$T_j=25^{\circ}\text{C}$ unless otherwise specified

Parameter	Symbol	Test Condition	Min	Typ	Max	Unit
STATIC CHARACTERICTISCS						
Drain-source breakdown voltage	$V_{(BR)DSS}$	$V_{GS} = 0V, I_D = 250\mu A$	20	-		V
Zero gate voltage drain current	I_{DSS}	$V_{DS} = 20V, V_{GS} = 0V$			1	μA
Gate-body leakage current	I_{GSS}	$V_{GS} = \pm 12V, V_{DS} = 0V$			± 10	μA
Gate threshold voltage (note 3)	$V_{GS(th)}$	$V_{DS} = V_{GS}, I_D = 250\mu A$	0.45	0.70	1.00	V
Drain-source on-resistance (note 3)	$R_{DS(on)}$	$V_{GS} = 4.5V, I_D = 6.0A$	-	4.3	5.0	m Ω
		$V_{GS} = 3.9V, I_D = 5.0A$	-	4.5	6.0	m Ω
		$V_{GS} = 2.5V, I_D = 4.0A$	-	6.0	7.0	m Ω
Forward tranconductance (note 3)	g_{FS}	$V_{DS} = 5V, I_D = 5.0A$	30			S
Diode forward voltage (note 3)	V_{SD}	$I_S = 5.0A, V_{GS} = 0V$			1.0	V
DYNAMIC CHARACTERICTISCS (note4)						
Input Capacitance	C_{ISS}	$V_{DS} = 10V, V_{GS} = 0V, f = 1MHz$		1634		pF
Output Capacitance	C_{OSS}			1010		pF
Reverse Transfer Capacitance	C_{RSS}			925		pF
SWITCHING CHARACTERICTISCS (note 4)						
Turn-on delay time	$t_{d(on)}$	$V_{GS} = 4.5V, V_{DS} = 10V, I_D = 5.0A$ $R_{GEN} = 3\Omega$		32.5		ns
Turn-on rise time	t_r			29.5		ns
Turn-off delay time	$t_{d(off)}$			47.0		ns
Turn-off fall time	t_f			7.9		ns
Total Gate Charge	Q_g	$V_{DS} = 10V, V_{GS} = 4.5V, I_D = 5.0A$		23.4		nC
Gate-Source Charge	Q_{gs}			4.7		nC
Gate-Drain Charge	Q_{gd}			7.5		nC

Notes :

1. Repetitive rating: Pulse 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

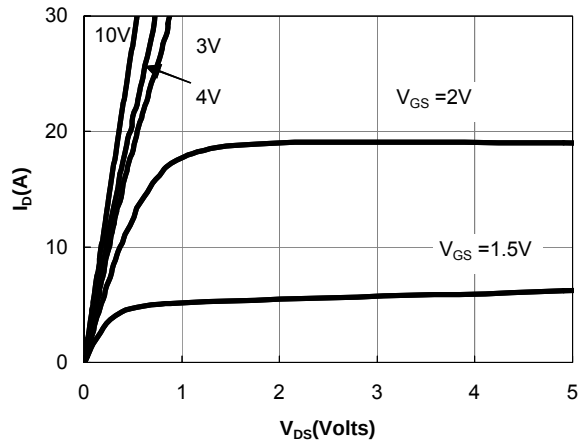


Figure 1: On-Regions Characteristic CS

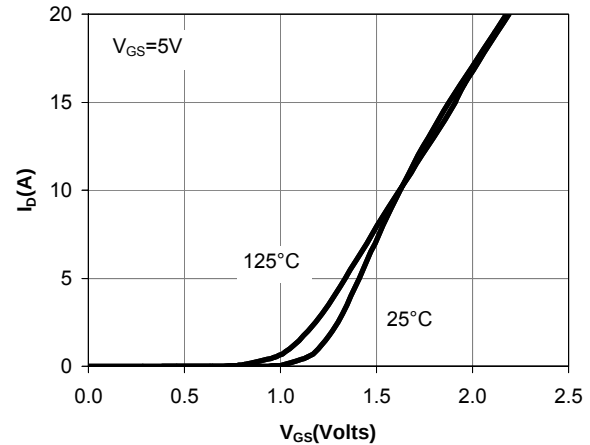


Figure 2: Transfer Characteristics

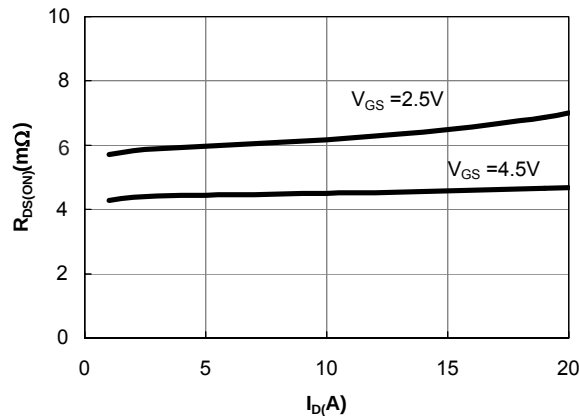


Figure 3: On-Resistance vs. Drain Current and Gate Voltage

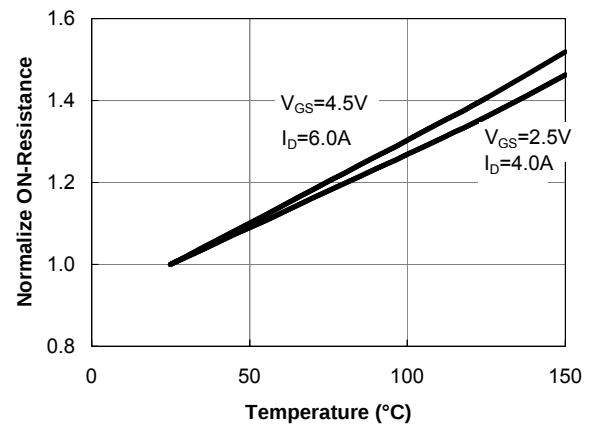


Figure 4: On-Resistance vs. Junction Temperature

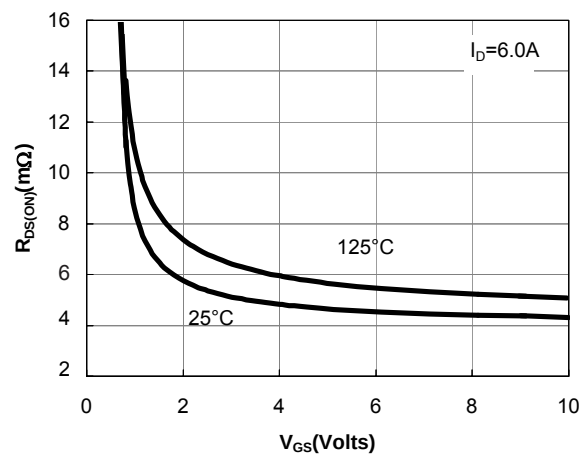


Figure 5: On-Resistance vs. Gate-Source Voltage

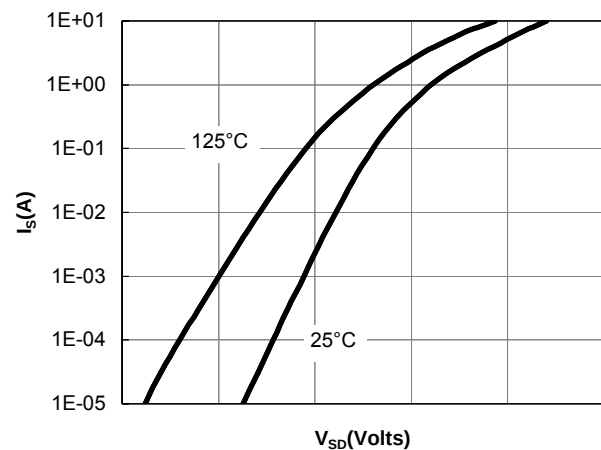
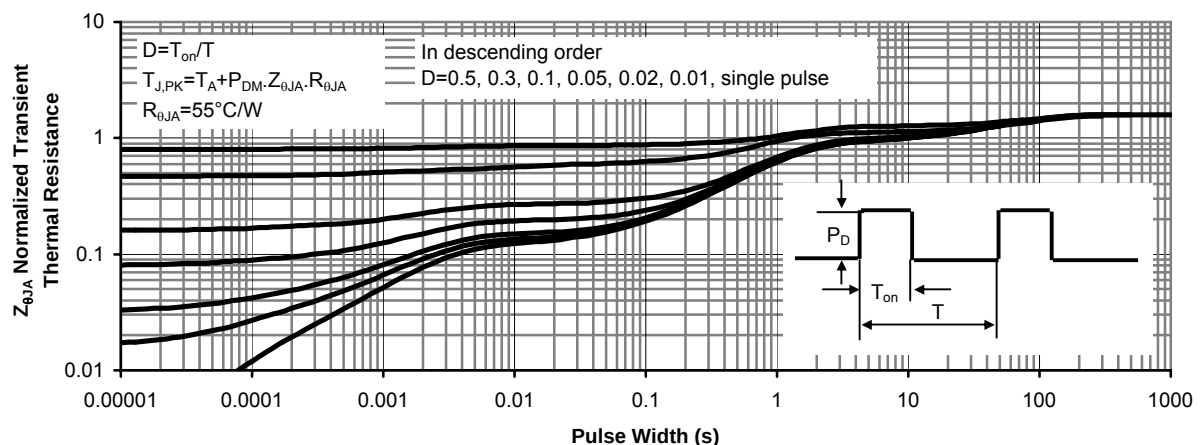
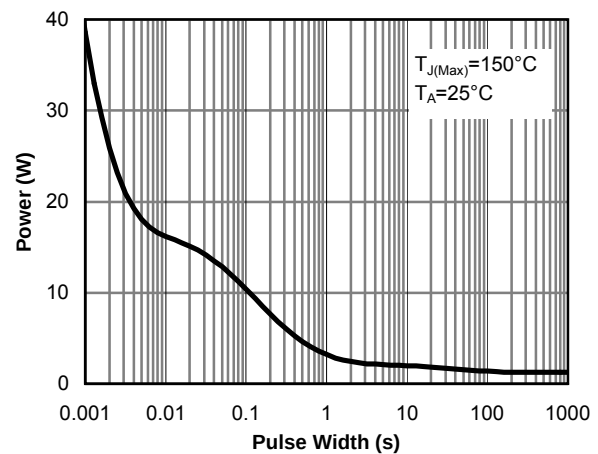
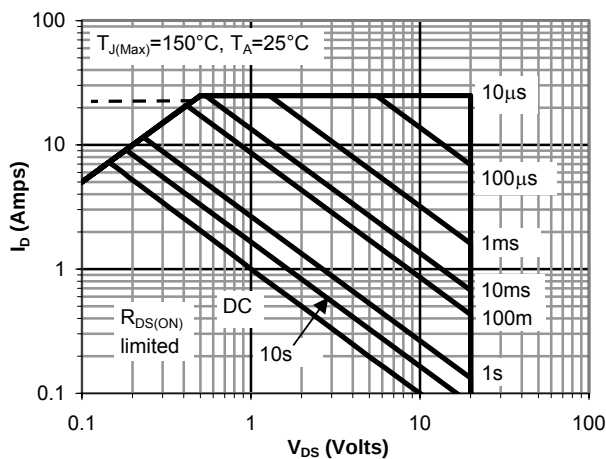
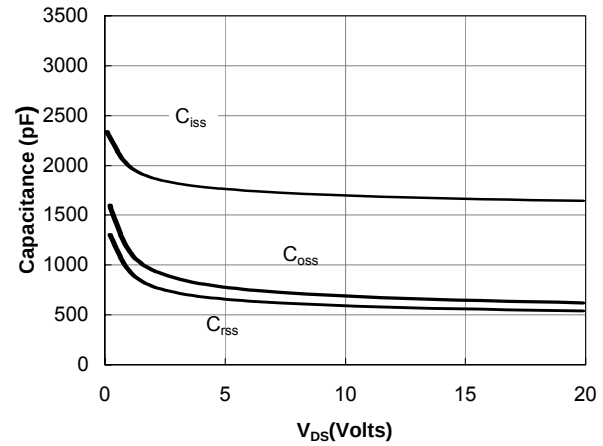
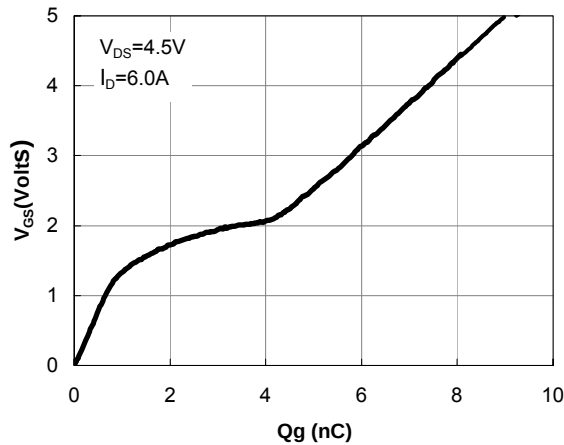
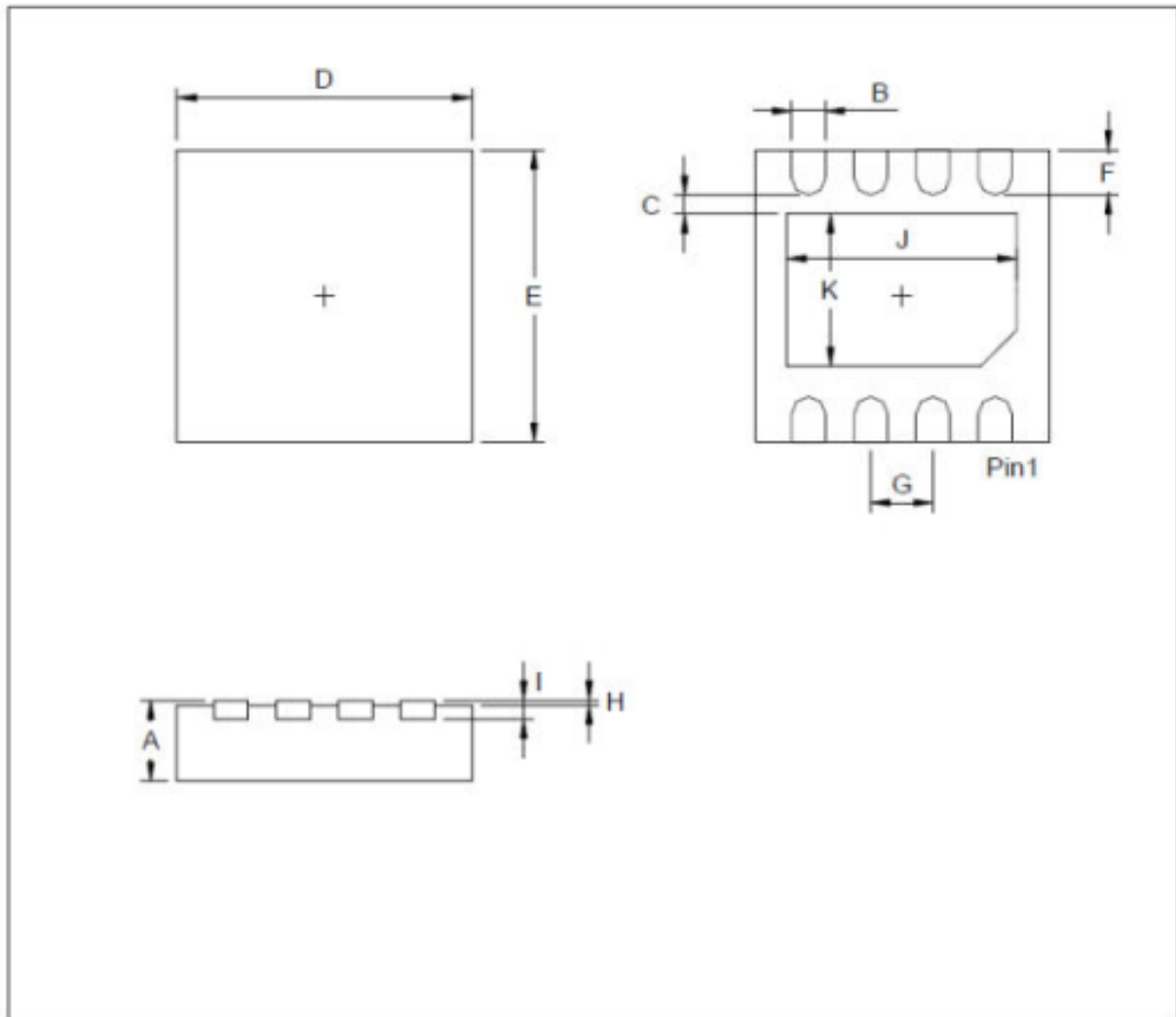


Figure 6: Body-Diode Characteristics

TYPICAL ELECTRICAL AND THERMAL CHARACTERISTICS



DFN3030-8L 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				