

100V N-CHANNEL ENHANCEMENT MODE MOSFET

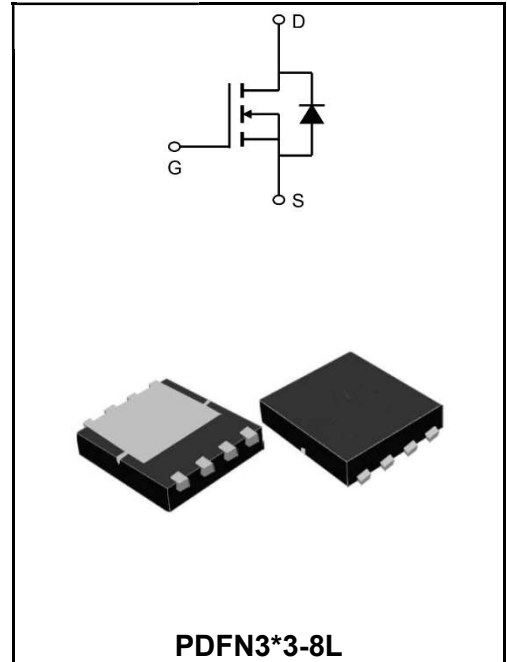
MAIN CHARACTERISTICS

I_D	40A
V_{DSS}	100V
$R_{DS(on)-typ}(@V_{GS}=10V)$	< 25mΩ (Type: 14 mΩ)



Application

- ◆ Consumer electronic power supply
- ◆ Motor control
- ◆ Synchronous-rectification
- ◆ Isolated DC



Product Specification Classification

Part Number	Package	Marking	Pack
YFW40N10DF	PDFN3*3-8L	YFW 40N10DF XXXXX	5000PCS/Tape

Maximum Ratings at $T_c=25^\circ\text{C}$ unless otherwise specified

Characteristics	Symbols	Value	Units
Drain-Source Voltage	V_{DS}	100	V
Gate - Source Voltage	V_{GS}	± 20	V
Continuous drain current ¹⁾ , $T_c=25^\circ\text{C}$	I_D	40	A
Pulsed drain current ²⁾ , $T_c=25^\circ\text{C}$	$I_{D, pulse}$	120	A
Power dissipation ³⁾ , $T_c=25^\circ\text{C}$	P_D	71	W
Single Pulse Avalanche Energy ⁵⁾	E_{AS}	57	mJ
Operation and storage temperature	T_{STG}, T_J	-55 to +150	$^\circ\text{C}$
Thermal Resistance, Junction-case	$R_{\theta JC}$	1.76	$^\circ\text{C/W}$
Thermal Resistance, Junction-ambient ⁴⁾	$R_{\theta JA}$	62	$^\circ\text{C/W}$

Maximum Ratings at Tc=25°C unless otherwise specified

Characteristics	Test Condition	Symbols	Min	Typ	Max	Units
Drain-Source Breakdown Voltage	$V_{GS}=0V, I_D=250\mu A$	BV_{DSS}	100	107	-	V
Gate -Threshold Voltage	$V_{DS}=V_{GS}, I_D=250\mu A$	$V_{GS(th)}$	1.2	1.5	2.5	V
Drain-source on-state resistance	$V_{GS}=10V, I_D=10A$	$R_{DS(on)}$	-	14	25.0	mΩ
	$V_{GS}=4.5V, I_D=7A$		-	18	30.0	
Gate-Source Leakage Current	$V_{GS}=\pm 20V$	I_{GSS}	-	-	± 100	nA
Drain-Source Leakage Current	$V_{DS}=100V, V_{GS}=0V$	I_{DSS}	-	-	1	μA
Input Capacitance	$V_{GS}=0V$ $V_{DS}=50V$ $f=100KHz$	C_{iss}	-	1003.9	-	pF
Output Capacitance		C_{oss}	-	185.4	-	
Reverse Transfer Capacitance		C_{rss}	-	9.8	-	
Turn-on delay time	$V_{GS}=10V$ $V_{DS}=50V$ $R_G=10\Omega$ $I_D=5A$	$t_{d(on)}$	-	16.6	-	ns
Rise Time		T_r	-	3.8	-	
Turn-Off Delay Time		$t_{d(OFF)}$	-	75.5	-	
Fall Time		t_f	-	46	-	
Total Gate Charge	$I_D=5A$ $V_{DS}=50V$ $V_{GS}=10V$	Q_g	-	16.2	-	nC
Gate-Source Charge		Q_{gs}	-	2.8	-	
Gate-Drain Charge		Q_{gd}	-	4.1	-	
Gate plateau voltage		$V_{plateau}$	-	3	-	V
Diode forward current	$V_{GS}<V_{th}$	I_S	-	30	-	A
Pulsed Source Current		I_{SP}	-	90	-	A
Reverse Recovery Time	$I_S=1A, di/dt=100A/\mu s$	t_{rr}	49	-	-	ns
Reverse Recovery Charge		Q_{rr}	61.8	-	-	nC
Peak reverse recovery current		I_{rrm}	2.4	-	-	A

Note :

- 1、Calculated continuous current based on maximum allowable junction temperature.
- 2、Repetitive rating; pulse width limited by max. junction temperature.
- 3、Pd is based on max. junction temperature, using junction-case thermal resistance.
- 4、The value of $R_{\theta ja}$ is measured with the device mounted on 1 in 2 FR-4 board with 2oz. Copper, in a still air environment with $T_a=25^\circ C$.
- 5、VDD=50 V, RG=25 Ω, L=0.3 mH, starting $T_j=25^\circ C$.

Ratings and Characteristic Curves

Typical Characteristics

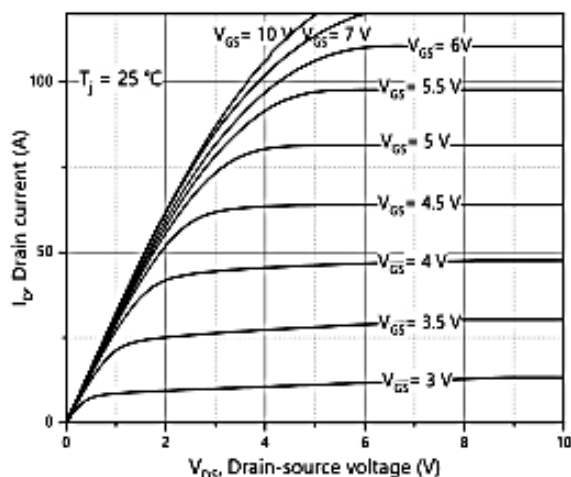


Figure 1, Typ. output characteristics

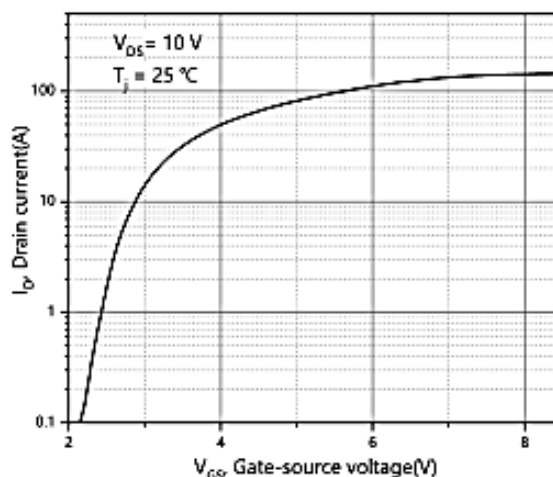


Figure 2, Typ. transfer characteristics

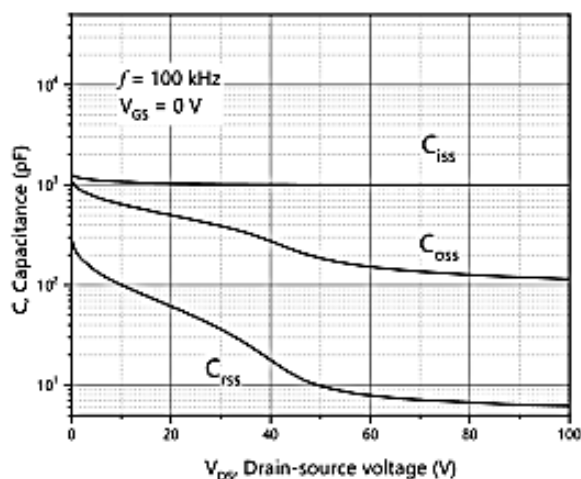


Figure 3, Typ. capacitances

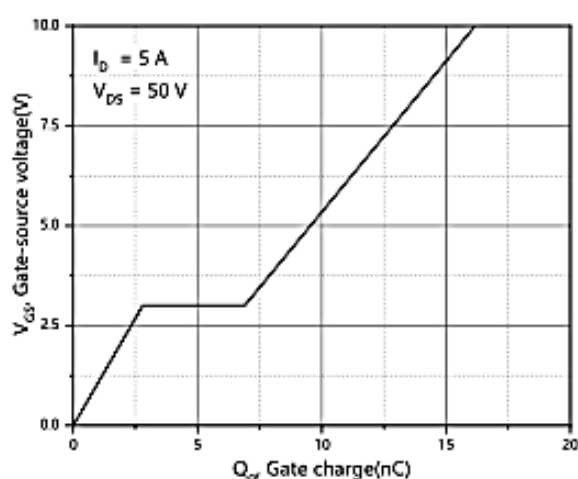


Figure 4, Typ. gate charge

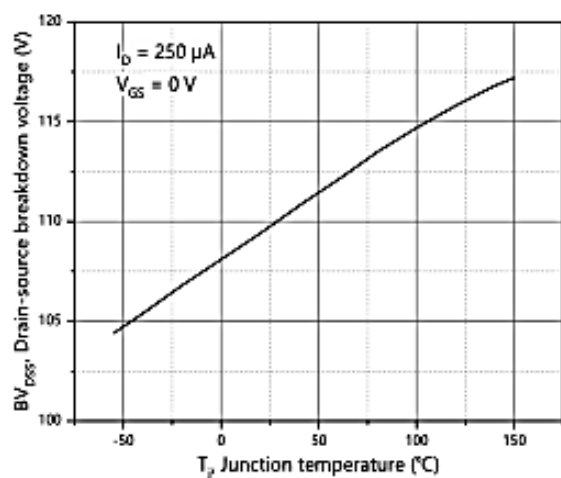


Figure 5, Drain-source breakdown voltage

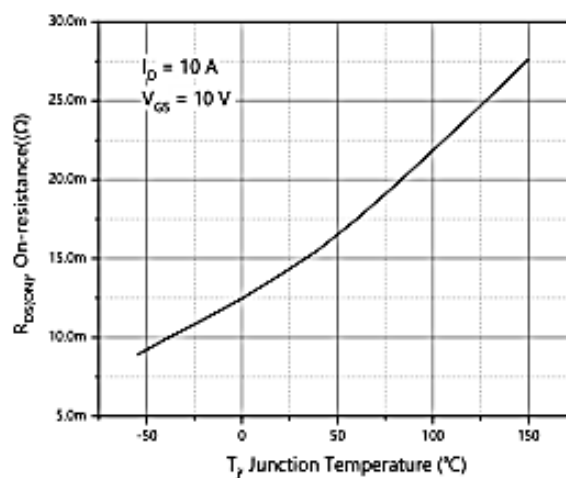


Figure 6, Drain-source on-state resistance

Ratings and Characteristic Curves

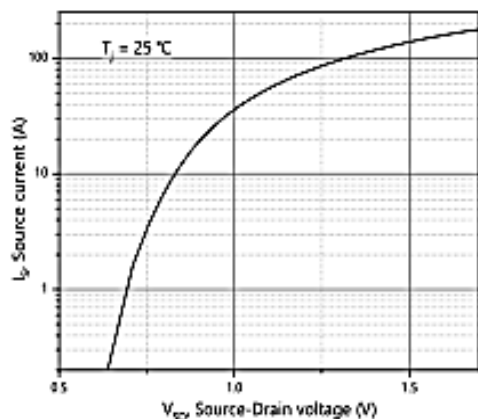


Figure 7, Forward characteristic of body diode

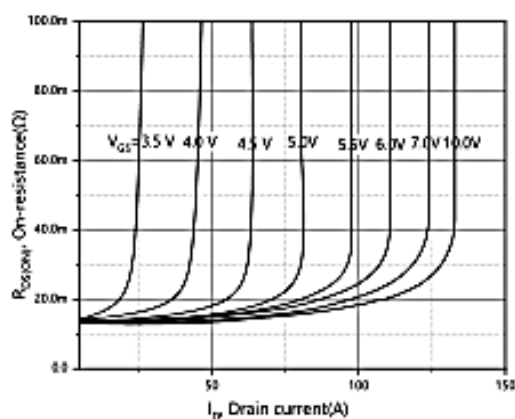


Figure 8, Drain-source on-state resistance

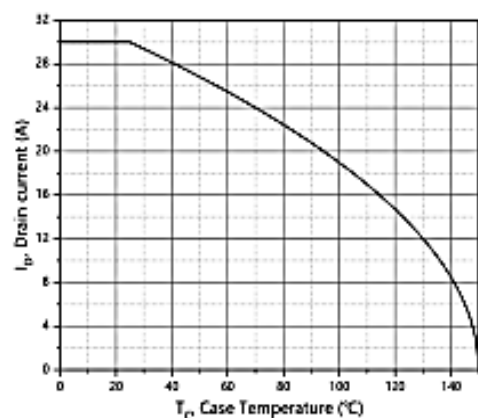


Figure 9, Drain current

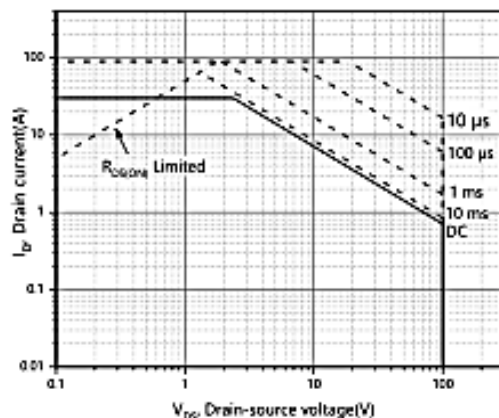


Figure 10, Safe operation area $T_C=25\text{ }^{\circ}\text{C}$

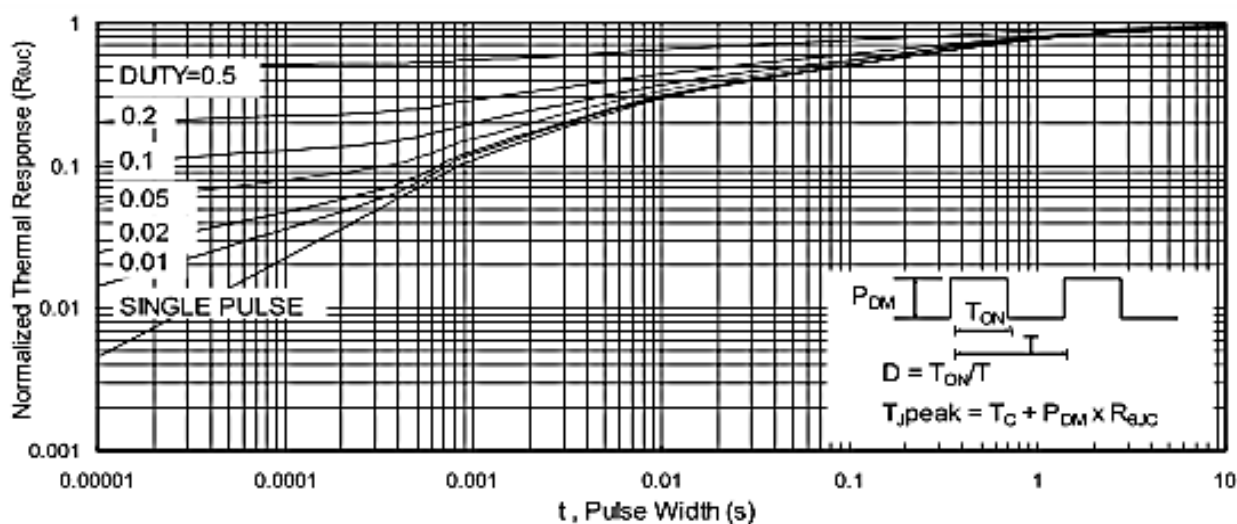
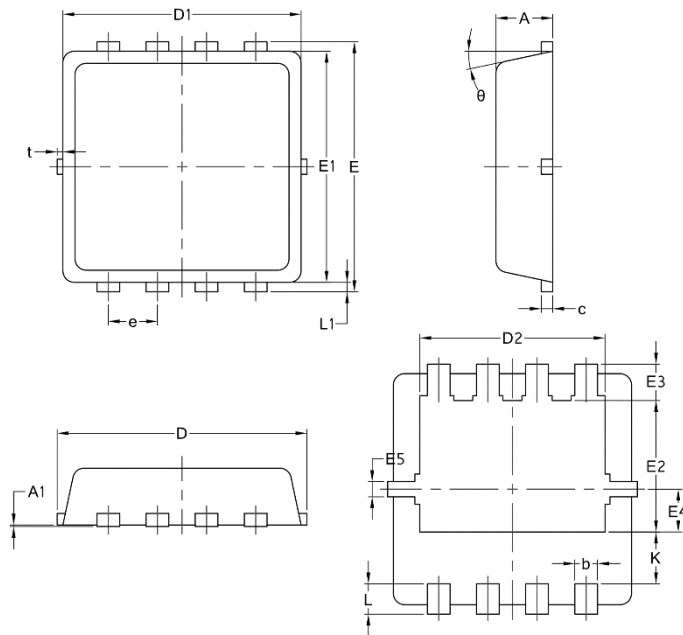


Fig11. Normalized Maximum Transient Thermal Impedance

PDFN3*3-8L



Symbol	Common		
	mm		
	Mim	Nom	Max
A	0.70	0.75	0.85
A1	/	/	0.05
b	0.20	0.30	0.40
c	0.10	0.152	0.25
D	3.15	3.30	3.45
D1	3.00	3.15	3.25
D2	2.29	2.45	2.65
E	3.15	3.30	3.45
E1	2.90	3.05	3.20
E2	1.54	1.74	1.94
E3	0.28	0.48	0.65
E4	0.37	0.57	0.77
E5	0.10	0.20	0.30
e	0.60	0.65	0.70
K	0.59	0.69	0.89
L	0.30	0.40	0.50
L1	0.06	0.125	0.20
t	0	0.075	0.13
Φ	10	12	14