

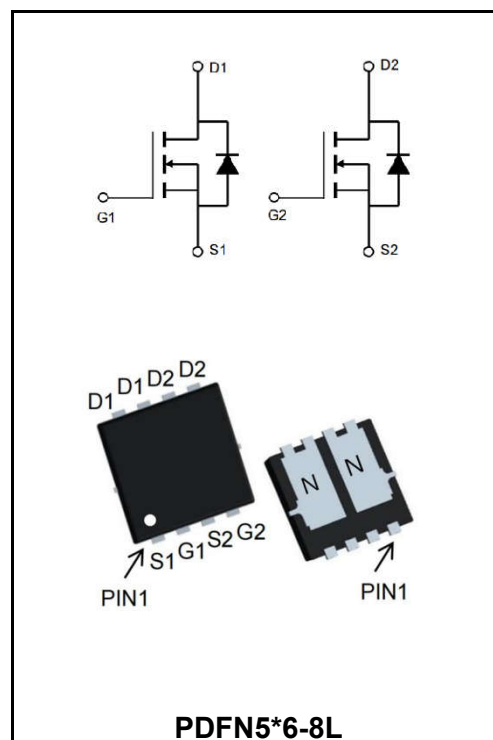
40V N+N-CHANNEL ENHANCEMENT MODE MOSFET

MAIN CHARACTERISTICS

I_D	20A
V_{DSS}	40V
$R_{DS(on)-typ}(@V_{GS}=10V)$	$< 16m\Omega$ (Type: 10.5 m Ω)

Application

- ◆ Battery protection
- ◆ Load switch
- ◆ Uninterruptible power supply



Product Specification Classification

Part Number	Package	Marking	Pack
YFW20H04NF	PDFN5*6-8L	YFW 20H04NF XXXXX	5000PCS/Tape

Maximum Ratings at Tc=25°C unless otherwise specified

Characteristics	Symbols	Value	Units
Drain-Source Voltage	V_{DS}	40	V
Gate - Source Voltage	V_{GS}	± 20	V
Drain Current-Continuous	I_D	20	A
Drain Current-Continuous($T_c=100^\circ\text{C}$)	$I_{D(100^\circ\text{C})}$	8.4	A
Pulsed Drain Current	I_{DM}	100	A
Maximum Power Dissipation	P_D	2	W
Operating Junction and Storage Temperature Range	T_J, T_{STG}	-55 to +150	$^\circ\text{C}$
Thermal Resistance, Junction-to-Ambient ^(Note 2)	$R_{\theta JA}$	62.5	$^\circ\text{C/W}$

Maximum Ratings at Tc=25°C unless otherwise specified

Characteristics	Test Condition	Symbols	Min	Typ	Max	Units
Drain-Source Breakdown Voltage	$V_{GS}=0V, I_D=250\mu A$	$B_{V_{DS}}$	40	-	-	V
Zero Gate Voltage Drain Current	$V_{DS}=40V, V_{GS}=0V$	I_{DSS}	-	-	1	μA
Gate-Body Leakage Current	$V_{GS}=\pm 20V, V_{DS}=0V$	I_{GSS}	-	-	± 100	nA
Gate -Threshold Voltage	$V_{DS}=V_{GS}, I_D=250\mu A$	$V_{GS(th)}$	1	1.5	2.0	V
Drain-Source On-State Resistance	$V_{GS}=10V, I_D=8A$	$R_{DS(ON)}$	-	10.5	16	m Ω
Drain-Source On-State Resistance	$V_{GS}=4.5V, I_D=4A$	$R_{DS(ON)}$	-	18.9	24	m Ω
Forward Transconductance	$V_{DS} = 5V, I_D = 8A$	g_{fs}	33	-	-	S
Input Capacitance	$V_{DS}=20V$ $V_{GS}=0V$ $f=1.0MHz$	C_{iss}	-	964	-	pF
Output Capacitance		C_{oss}	-	109	-	pF
Reverse Transfer Capacitance		C_{rss}	-	96	-	pF
Turn-on delay time	$V_{DD}=20V \quad R_L=2.5 \Omega$ $V_{GS}=10V \quad R_{GEN} = 3\Omega$	$t_{d(on)}$	-	5.5	-	ns
Turn-on Rise Time		T_r	-	14	-	ns
Turn-Off Delay Time		$t_{d(OFF)}$	-	24	-	ns
Turn- Off Fall Time		t_f	-	12	-	ns
Total Gate Charge	$V_{DS}=20V$ $I_D=8A$ $V_{GS}=10V$	Q_g	-	22.9	-	nC
Gate-Source Charge		Q_{gs}	-	3.5	-	nC
Gate-Drain Charge		Q_{gd}	-	5.3	-	nC
Diode Forward Voltage ^(Note 3)	$V_{GS}=0V, I_S=9A$	V_{SD}	-	0.8	1.2	V

Ratings and Characteristic Curves

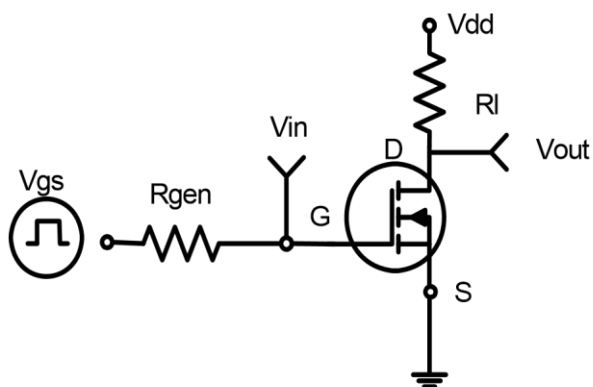


Figure 1: Switching Test Circuit

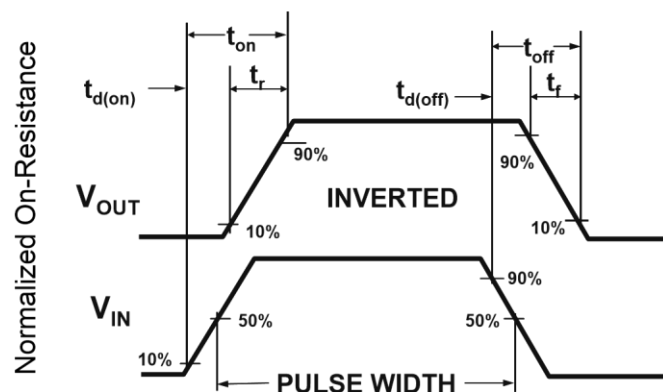


Figure 2: Switching Waveforms

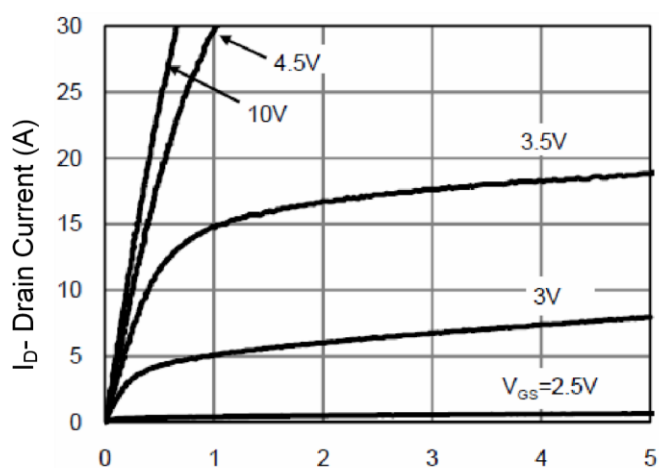


Figure 3 Output Characteristics

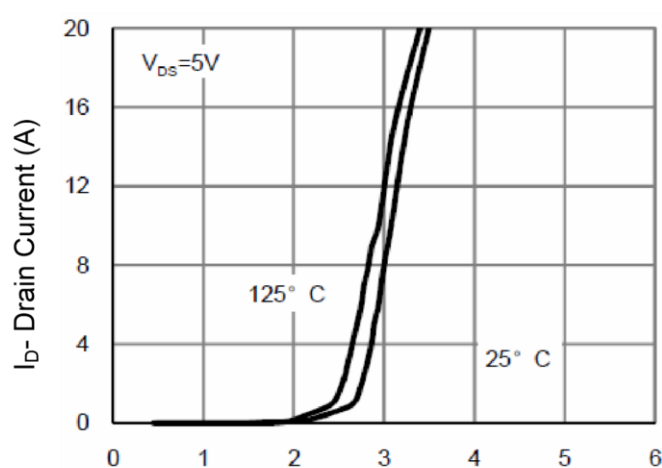


Figure 4 Transfer Characteristics

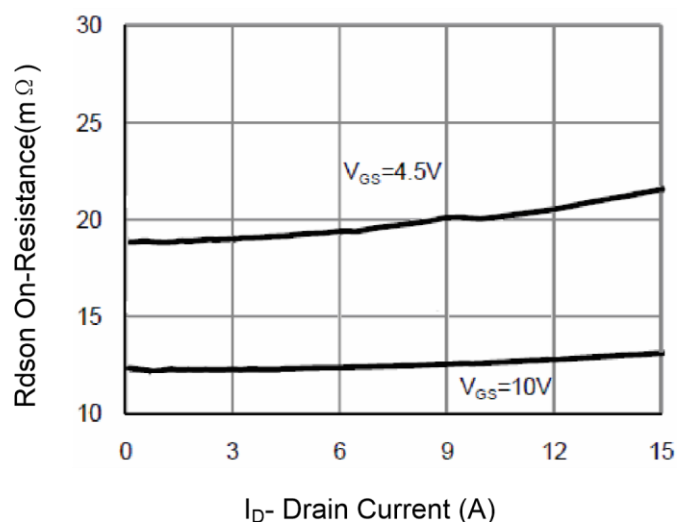


Figure 5 Drain-Source On-Resistance

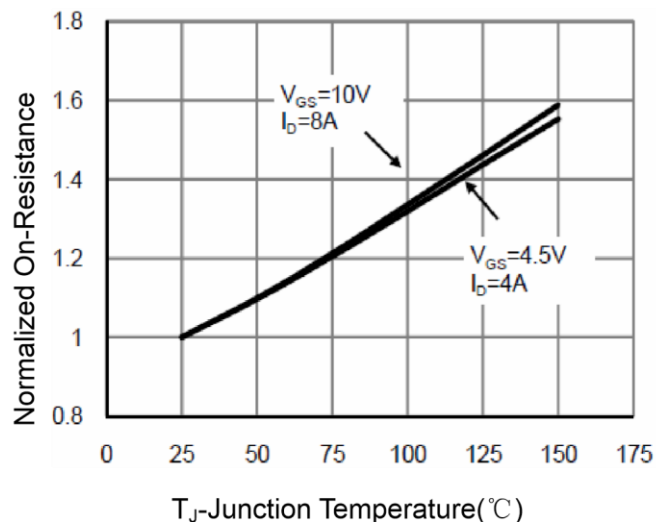
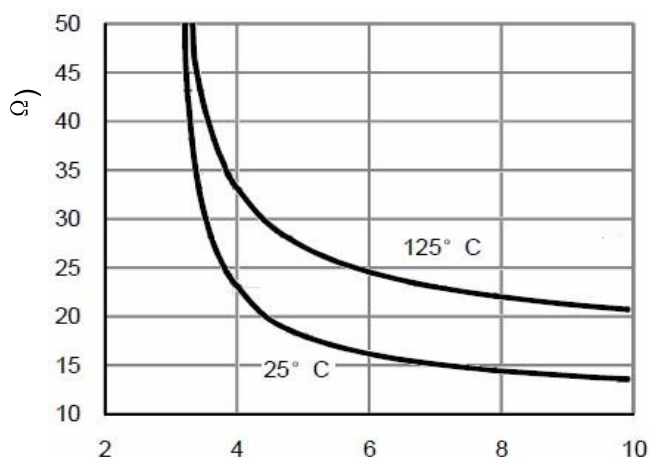
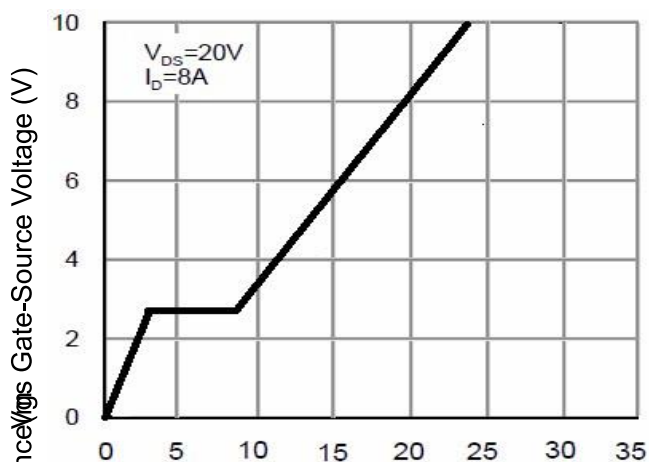


Figure 6 Drain-Source On-Resistance

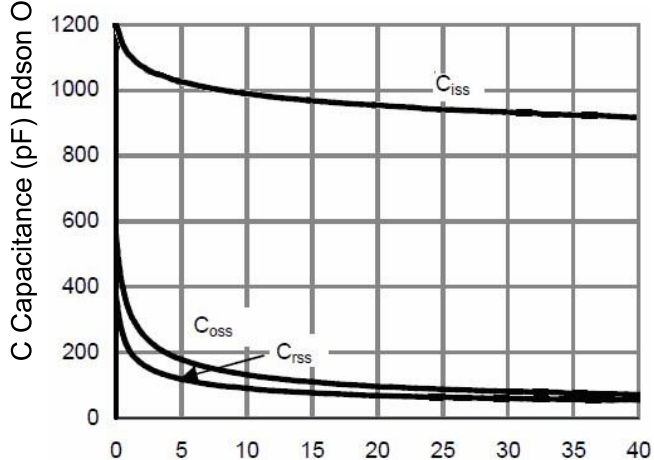
Ratings and Characteristic Curves



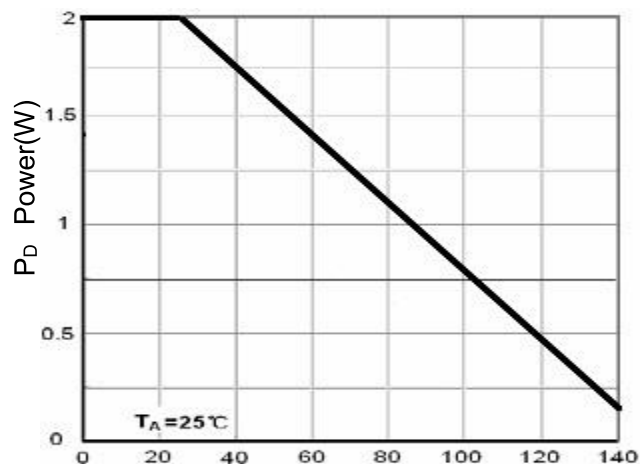
Vgs Gate-Source Voltage (V)
Figure 7 Rdson vs Vgs



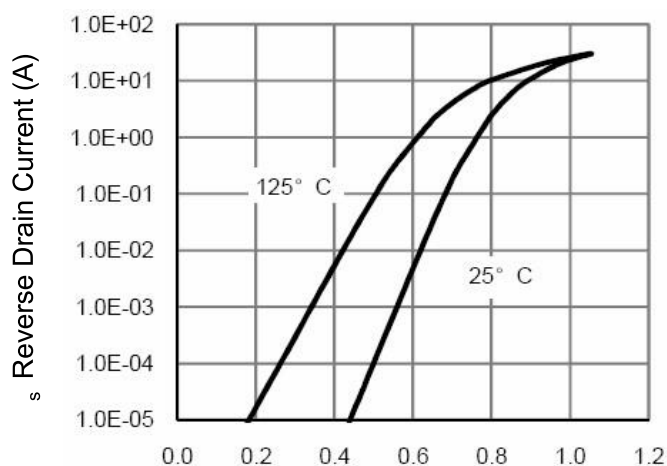
Qg Gate Charge (nC)
Figure 9 Gate Charge



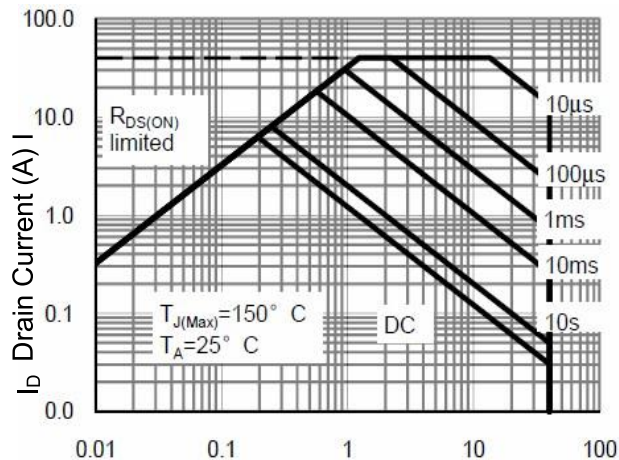
Vds Drain-Source Voltage (V)
Figure 11 Capacitance vs Vds



TJ-Junction Temperature(°C)
Figure 8 Power Dissipation



Vds Drain-Source Voltage (V)
Figure 10 Source- Drain Diode Forward



Vds Drain-Source Voltage (V)
Figure 12 Safe Operation Area

Ratings and Characteristic Curves

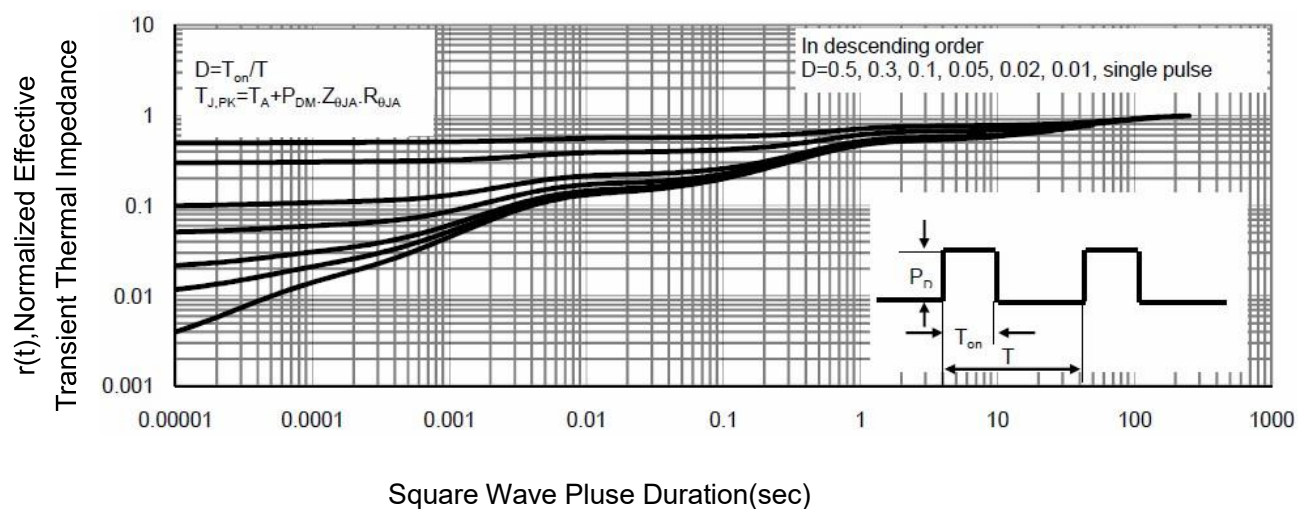
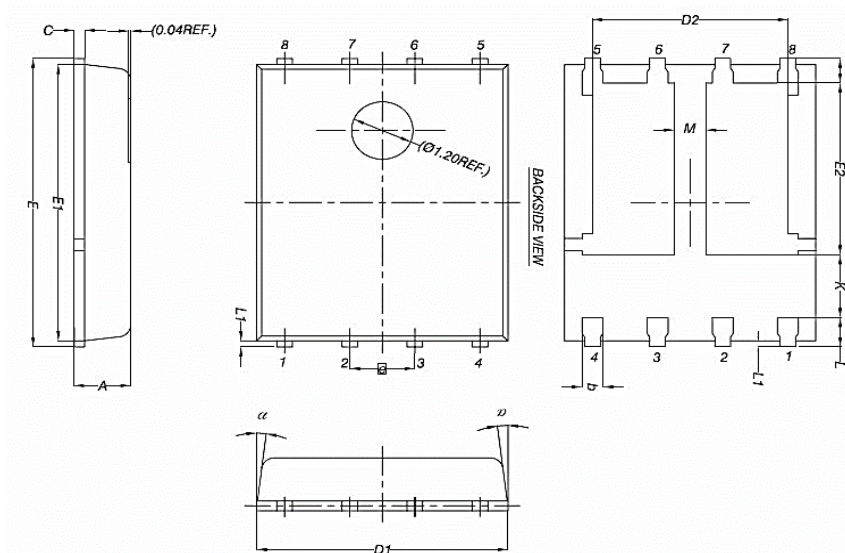


Figure 13 Normalized Maximum Transient Thermal Impedance

PDFN5*6-8L



Symbol	Common		
	mm		
	Mim	Nom	Max
A	0.90	1.00	1.10
b	0.33	0.41	0.51
C	0.20	0.25	0.30
D1	4.80	4.90	5.00
D2	3.61	3.81	3.96
E	5.90	6.00	6.10
E1	5.70	3.30	3.45
E2	3.38	3.05	3.20
e	1.27BSC		
H	0.41	0.51	0.61
K	1.10	--	--
L	0.51	0.61	0.71
L1	0.06	0.13	0.20
M	0.50	--	--
a	0°	--	12°