

30V N-CHANNEL TRENCH POWER MOSFET

MAIN CHARACTERISTICS

I_D	20A
V_{DSS}	30V
$R_{DS(on)-typ}(@V_{GS}=10V)$	$<25m\Omega$ (Typ:18m Ω)
$R_{DS(on)-typ}(@V_{GS}=4.5V)$	$<40m\Omega$ (Typ:28m Ω)

FEATURES

- Advanced Trench Technology
- Excellent $R_{DS(ON)}$ and Low Gate Charge

APPLICATIONS

- Load Switch
- PWM Application
- Power Management

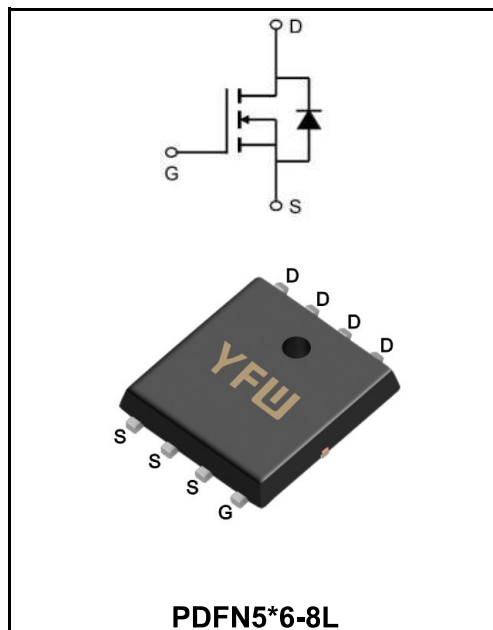
MECHANICAL DATA

- Case: PDFN5x6-8L/NF
- Mounting Position: Any
- Molded Plastic: UL Flammability Classification Rating 94V-0
- Lead free in compliance with EU RoHS 2011/65/EU directive
- Solder bath temperature 275°C maximum, 10s per JESD 22-B106

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

Characteristics	Symbol	Value	Unit
Drain-Source Voltage	V_{DS}	30	V
Gate-Source Voltage	V_{GS}	± 20	V
Continue Drain Current	I_D	20	A
Pulsed Drain Current (Note1)	I_{DM}	57	A
Power Dissipation	P_D	1.1	W
Single Pulse Avalanche Energy(Note1)	E_{AS}	24	mJ
Operating Temperature Range	T_J	150	$^\circ\text{C}$
Storage Temperature Range	T_{STG}	-55 to +150	$^\circ\text{C}$
Thermal Resistance, Junction to Case	$R_{\theta JC}$	5.1	$^\circ\text{C/W}$
Thermal Resistance, Junction to Ambient	$R_{\theta JA}$	113	$^\circ\text{C/W}$

Note1: Pulse test: 300 μs pulse width, 2 % duty cycle



Maximum Ratings at Tc=25°C unless otherwise specified

Characteristics	Test Condition	Symbol	Min	Typ	Max	Unit
Drain-Source Breakdown Voltage	$V_{GS} = 0\text{ V}, I_D = 250\text{ }\mu\text{A}$	BV_{DSS}	30	-	-	V
Drain-Source Leakage Current	$V_{DS} = 30\text{ V}, V_{GS} = 0\text{ V}$	I_{DSS}	-	-	1	μA
Gate Leakage Current	$V_{GS} = \pm 20\text{ V}, V_{DS} = 0\text{ V}$	I_{GSS}	-	-	± 100	nA
Gate-Source Threshold Voltage	$V_{DS} = V_{GS}, I_D = 250\text{ }\mu\text{A}$	$V_{GS(th)}$	1	-	2.5	V
Drain-Source On-State Resistance	$V_{GS} = 10\text{ V}, I_D = 5.5\text{ A}$	$R_{DS(ON)}$	-	18	25	mΩ
	$V_{GS} = 4.5\text{ V}, I_D = 4.5\text{ A}$		-	28	40	mΩ
Input Capacitance	$V_{GS} = 0\text{ V}, V_{DS} = 15\text{ V},$ $f = 1\text{ MHz}$	C_{iss}	-	485	-	pF
Output Capacitance		C_{oss}	-	69	-	
Reverse Transfer Capacitance		C_{rss}	-	53	-	
Turn-on Delay Time(Note2)	$V_{GS}=10\text{ V}$ $V_{DD}=15\text{ V}$ $R_G=3\text{ }\Omega$ $I_D=5\text{ A}$	$t_{d(on)}$	-	4	-	ns
Rise Time(Note2)		T_r	-	11	-	
Turn-Off Delay Time(Note2)		$t_{d(OFF)}$	-	14	-	
Fall Time(Note2)		t_f	-	2	-	
Total Gate Charge(Note2)	$I_D = 5\text{ A}$ $V_{DD} = 15\text{ V}$ $V_{GS} = 10\text{ V}$	Q_g	-	10	-	nC
Gate to Source Charge(Note2)		Q_{gs}	-	2	-	
Gate to Drain Charge(Note2)		Q_{gd}	-	2	-	
Maximun Body-Diode Continuous Current		I_S	-	-	20	A
Maximun Body-Diode Pulsed Current(Note2)		I_{SM}	-	-	57	A
Drain-Source Diode Forward Voltage	$I_{SD} = 5.8\text{ A}$	V_{SD}	-	-	1.2	V
Reverse Recovery Time(Note2)	$I_{SD} = 5\text{ A}, V_{GS} = 0\text{ V},$ $dI_F / dt = 100\text{ A}/\mu\text{s}$	trr	-	7.5	-	ns
Reverse Recovery Charge(Note2)		Q_{rr}	-	2	-	nC

Note2:Pulse test: 300 μs pulse width, 2 % duty cycle

RATINGS AND CHARACTERISTIC CURVES

Figure 1: Output Characteristics

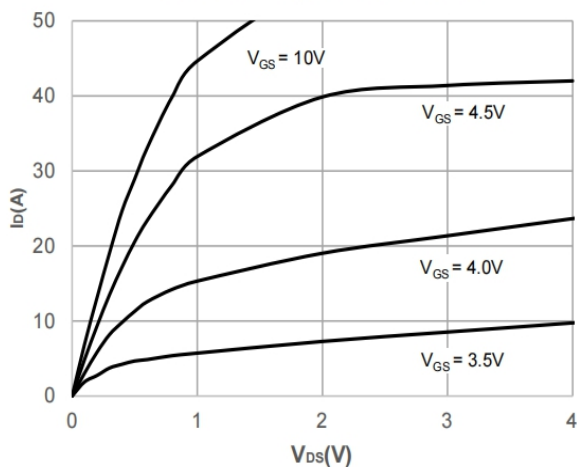


Figure 2: Typical Transfer Characteristics

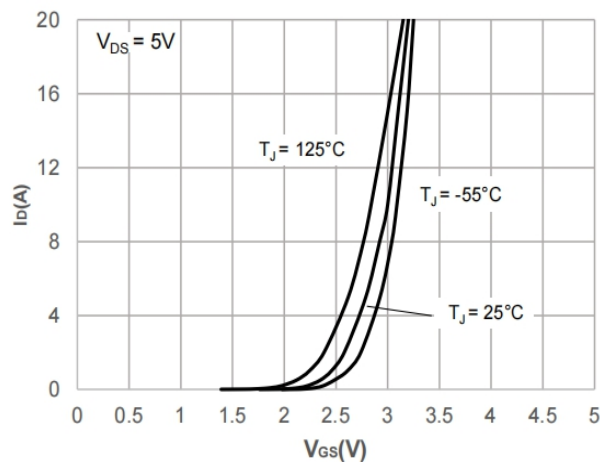


Figure 3: On-resistance vs. Drain Current

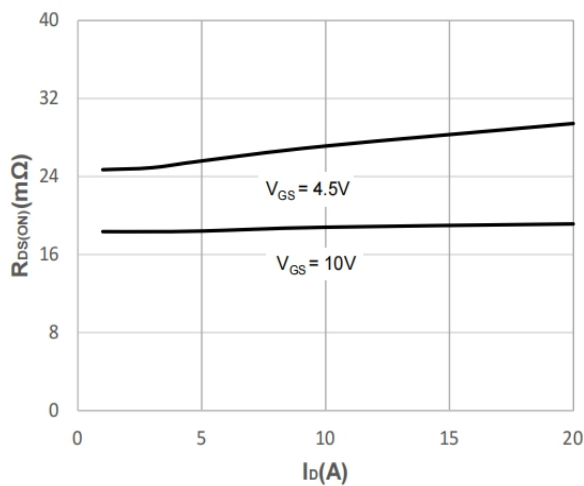


Figure 4: Body Diode Characteristics

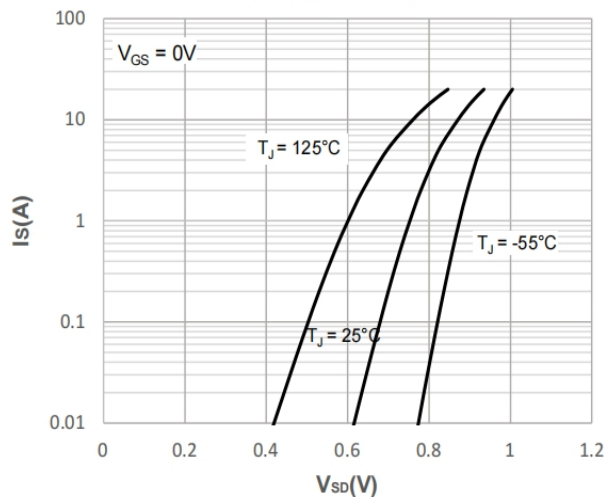


Figure 5: Gate Charge Characteristics

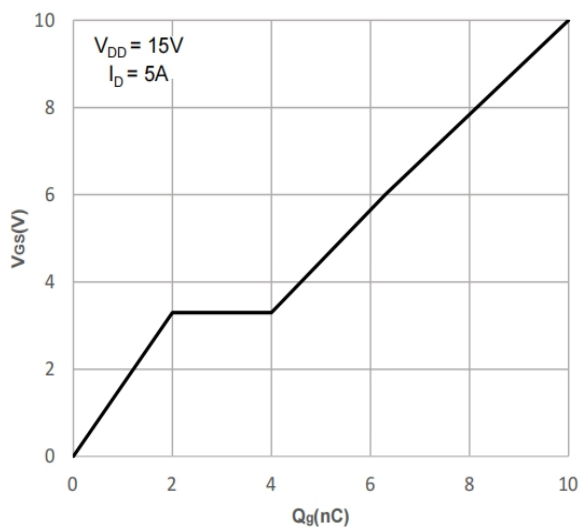
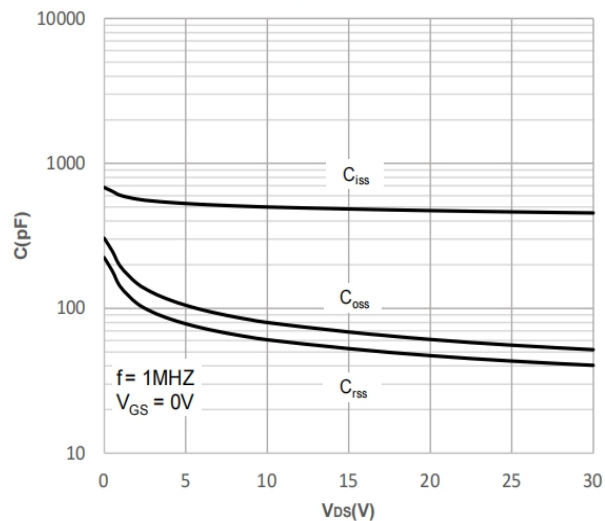


Figure 6: Capacitance Characteristics



RATINGS AND CHARACTERISTIC CURVES

Figure 7: Normalized Breakdown voltage vs. Junction Temperature

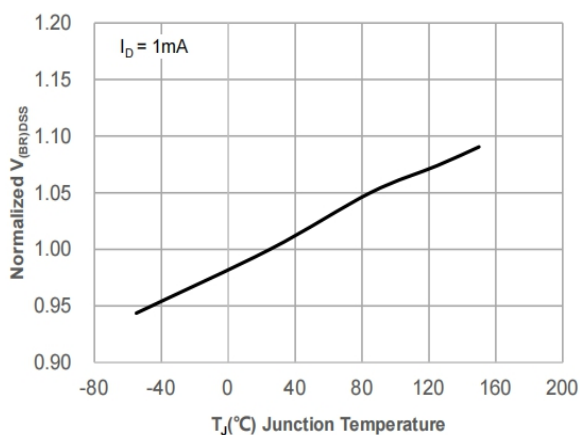


Figure 8: Normalized on Resistance vs. Junction Temperature

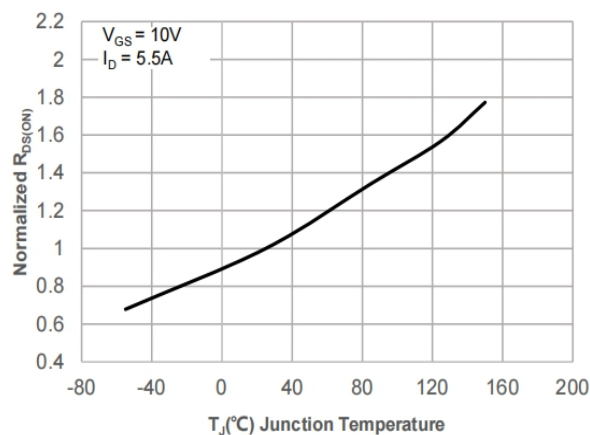


Figure 9: Maximum Safe Operating Area

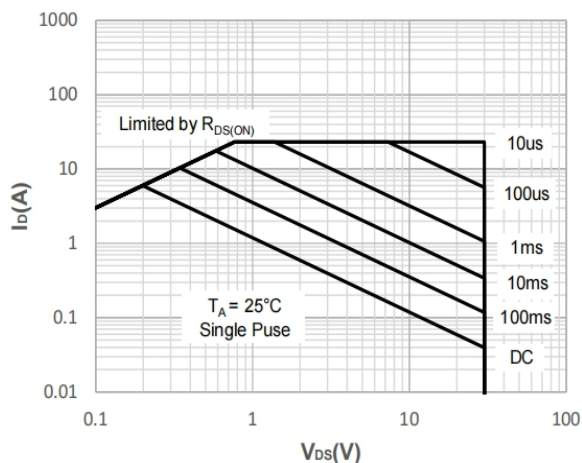


Figure 10: Maximum Continuous Drain Current vs. Ambient Temperature

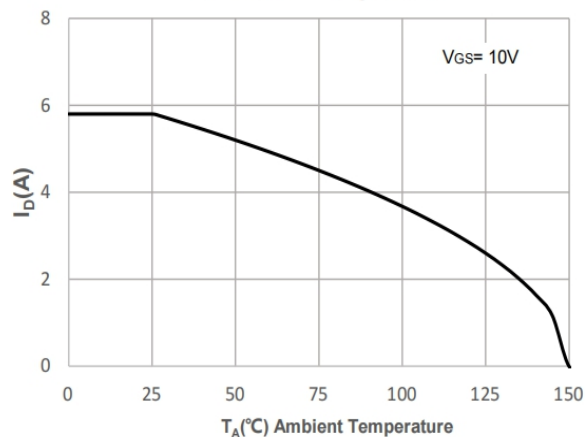


Figure 11: Normalized Maximum Transient Thermal Impedance

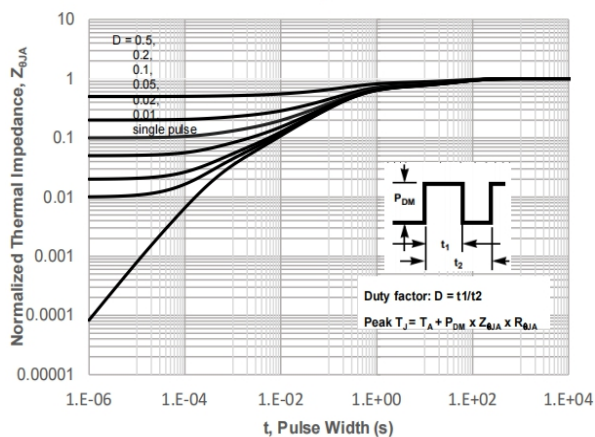
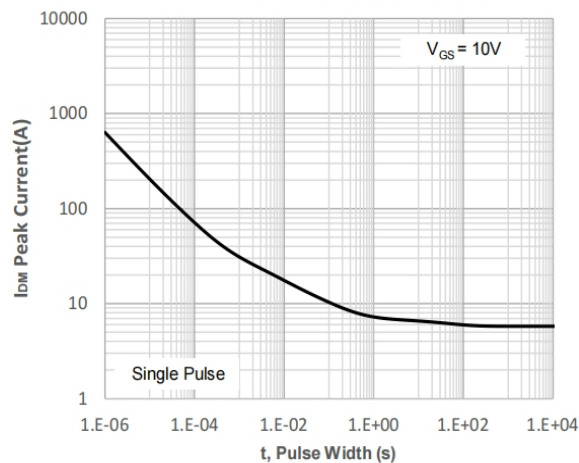
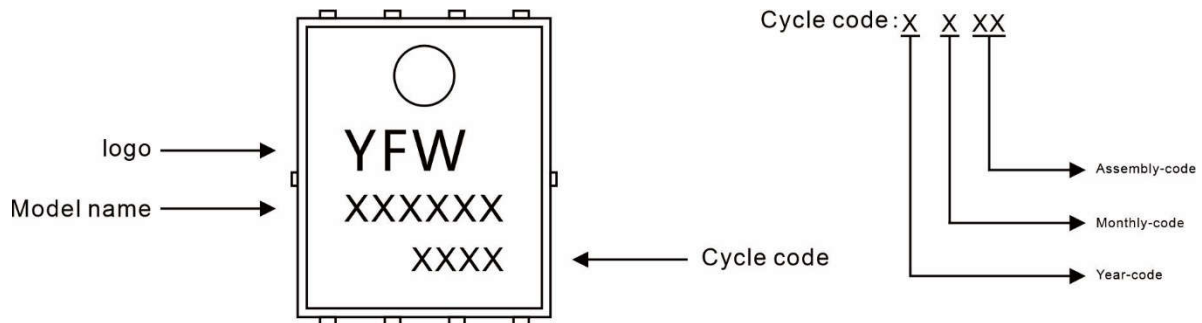


Figure 12: Peak Current Capacity



Marking Diagram



Ordering information

Model name	Package	Unit Weight	Base Quantity	Packing Quantity
YFW20N03NF	PDFN5*6-8L	0.0032oz(0.093g)	5000pcs/reel	10000pcs/box 50000pcs/Carton

Package Dimensions

PDFN5*6-8L

Dim	Millimeter		mil	
	Min.	Max.	Min.	Max.
A	0.9	1.2	35	45
A2	0.204	0.304	8	12
b	0.4ref.		16ref.	
b1	0.2	0.4	8	16
D	5.0	5.3	197	209
D1	4.84	5.24	191	206
E	5.95	6.35	234	250
E1	3.275	3.675	129	145
E2	5.69	6.09	224	232
e	1.27typ.		50typ.	
K	1.29typ.		51typ.	
L	0.585	0.785	23	27
L1	0.7typ.		28typ.	

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