

100V N- Channel SGT Power MOSFET

MAIN CHARACTERISTICS

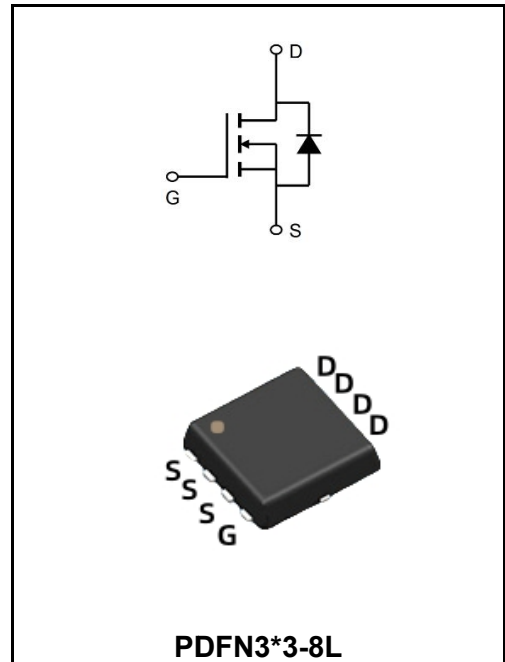
I_D	50A
V_{DS}	100V
R_{DS(ON)-typ(@V_{GS}=10V)}	<20mΩ(Typ:14mΩ)

Features

- ◆ YFW-SGT technology
- ◆ Ultra-Low RDS(ON)
- ◆ Low Gate Charge
- ◆ High Current Capability

Application

- ◆ Power Management in Telecom., Industrial Automation
- ◆ Motor Driving in Power Tool, E-vehicle, Robotics
- ◆ Current Switching in DC/DC&AC/DC(SR) Sub-systems



Maximum Ratings at Tc=25°C unless otherwise specified

Characteristics	Symbols	Value	Units
Drain-Source Voltage	V_{DS}	100	V
Gate - Source Voltage	V_{GS}	±20	V
Continue Drain Current	I_D	50	A
Pulsed Drain Current (Note1)	I_{DM}	200	A
Power Dissipation	P_D	80	W
Single Pulse Avalanche Energy	E_{AS}	74	mJ
Operating Temperature Range	T_J	150	°C
Storage Temperature Range	T_{STG}	-55 to +150	°C
Thermal Resistance, Junction-case(Note 2)	R_{θJC}	1.3	°C/W
Thermal Resistance, Junction-ambient	R_{θJA}	38	°C/W

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

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	-	-	V
Drain-Source Leakage Current	$V_{DS}=100V, V_{GS}=0V$	I_{DSS}	-	-	1	μA
	$V_{DS}=100V, T_C=125^\circ C$		-	-	100	μA
Gate Leakage Current	$V_{GS} = \pm 20 V, V_{DS} = 0 V$	I_{GSS}			± 100	nA
Gate-Source Threshold Voltage	$V_{DS}=V_{GS}, I_D=250\mu A$	$V_{GS(th)}$	1.2	-	2.2	V
Drain-source on-state resistance	$V_{GS}=10V, I_D=20A$	$R_{DS(ON)}$	-	14	20	m Ω
	$V_{GS}=4.5V, I_D=15A$		-	18.6	25	
Input Capacitance	$V_{GS}=0V$ $V_{DS}=50V$ $f=1MHz$	C_{iss}	-	1120	-	μF
Output Capacitance		C_{oss}	-	330	-	
Reverse Transfer Capacitance		C_{rss}	-	19.2	-	
Turn-on delay time	$V_{GS}=10V$ $V_{DS}=50V$ $R_G=6.2\Omega$ $I_D=20A$	$t_{d(on)}$	-	7	-	ns
Rise Time		T_r	-	18	-	
Turn-Off Delay Time		$t_{d(OFF)}$	-	21	-	
Fall Time		t_f	-	9	-	
Total Gate Charge	$I_D=20A$ $V_{DS}=50V$ $V_{GS}=10V$	Q_g	-	19	-	nC
Gate-Source Charge		Q_{gs}	-	4	-	
Gate-Drain Charge		Q_{gd}	-	5	-	
Maximun Body-Diode Continuous Current (Note 2)		I_S	-	-	50	A
Maximun Body-Diode Pulsed Current		I_{SM}	-	-	200	A
Drain-Source Diode Forward Voltage	$I_{SD}=20A$	V_{SD}	-	-	1.2	V
Reverse Recovery Time	$I_S = I_F, I_{SD}=20A, V_{GS} = 0 V,$ $di / dt = 100 A/\mu s$	t_{rr}	-	32	-	ns
Reverse Recovery Charge		Q_{rr}	-	32	-	nC

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

Ratings and Characteristic Curves

Figure 1: Power De-rating

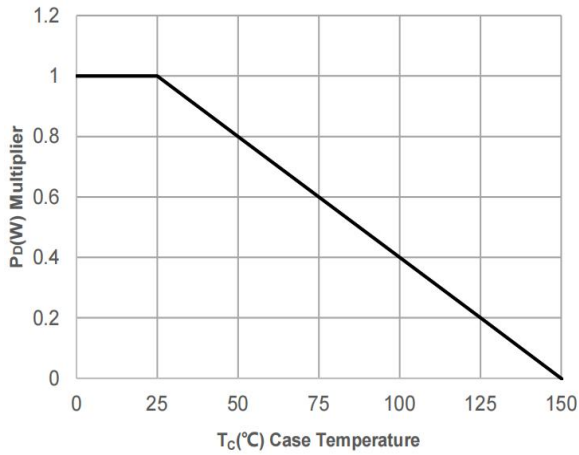


Figure 2: Current De-rating

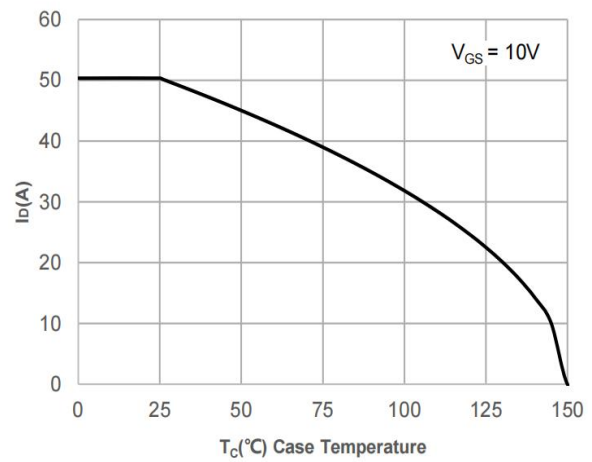


Figure 3: Normalized Maximum Transient Thermal Impedance

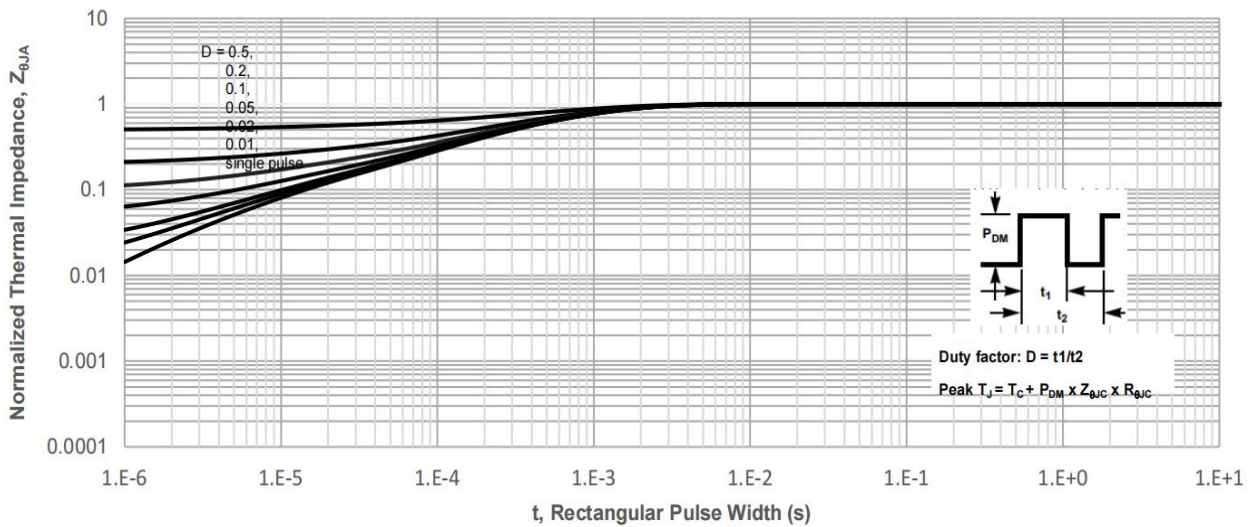
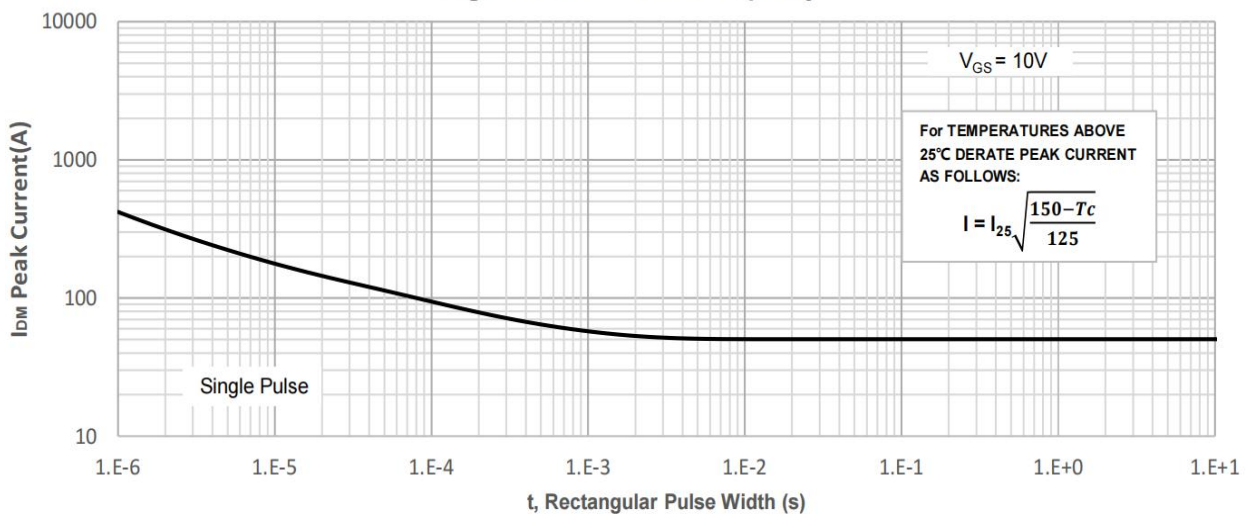


Figure 4: Peak Current Capacity



Ratings and Characteristic Curves

Figure 5: Output Characteristics

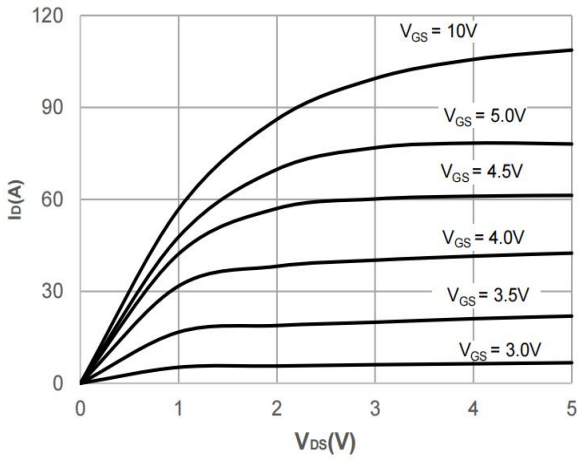


Figure 6: Typical Transfer Characteristics

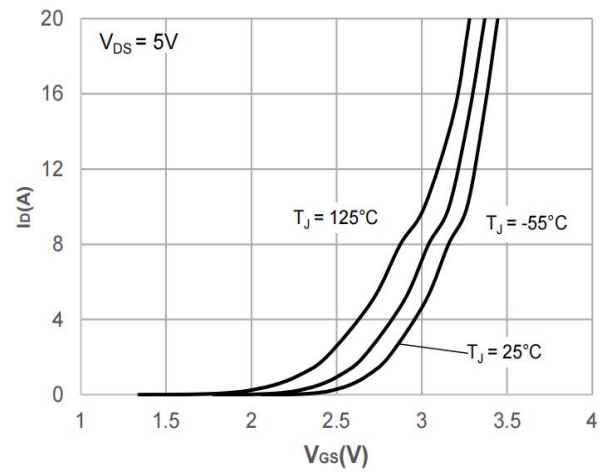


Figure 7: On-resistance vs. Drain Current

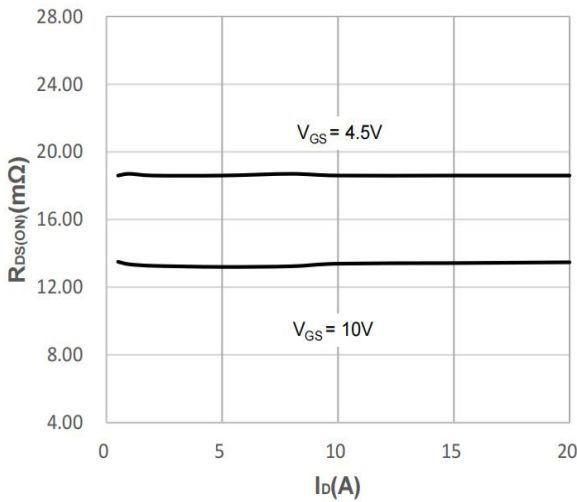


Figure 8: Body Diode Characteristics

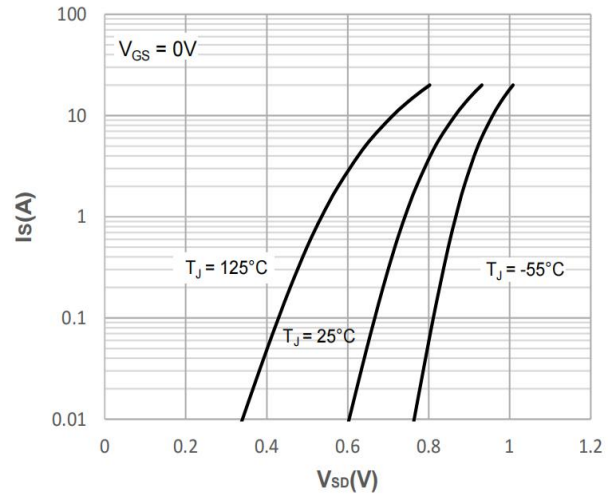


Figure 9: Gate Charge Characteristics

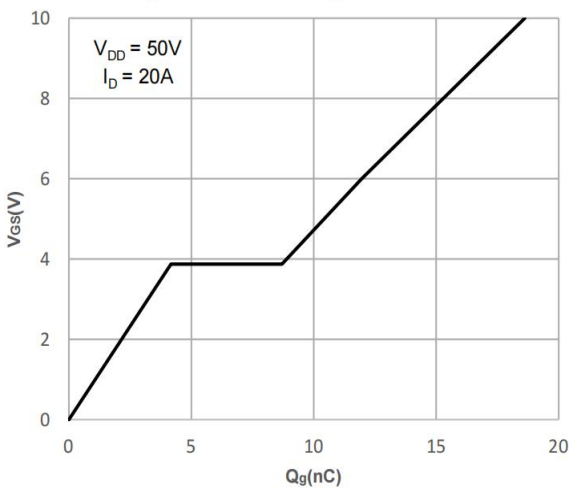
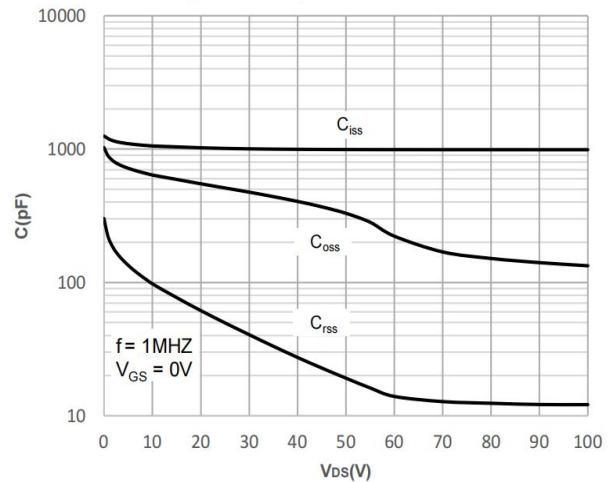


Figure 10: Capacitance Characteristics



Ratings and Characteristic Curves

Figure 11: Normalized Breakdown voltage vs. Junction Temperature

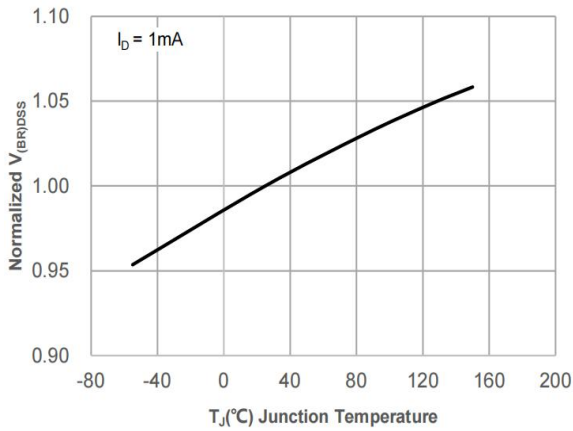


Figure 12: Normalized on Resistance vs. Junction Temperature

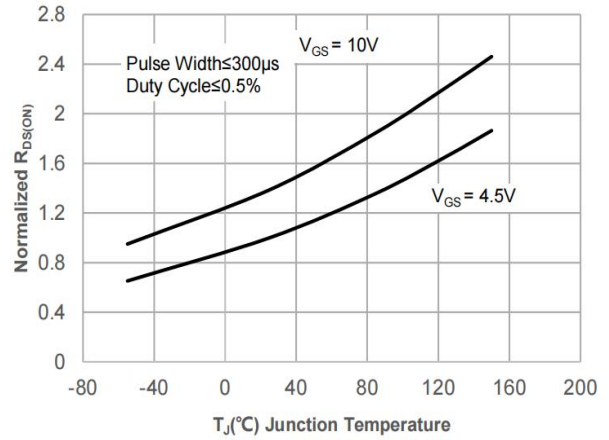


Figure 13: Normalized Threshold Voltage vs. Junction Temperature

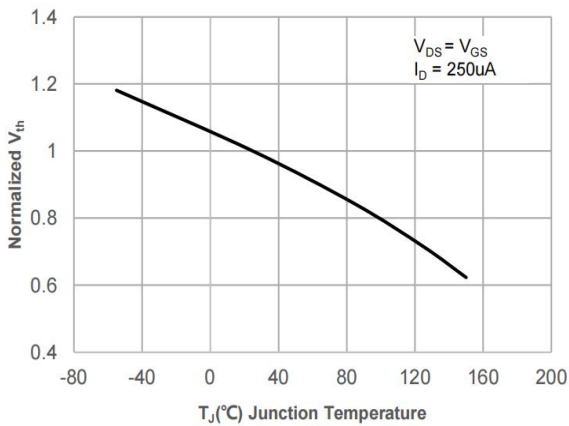


Figure 14: R_{DS(ON)} vs. V_{GS}

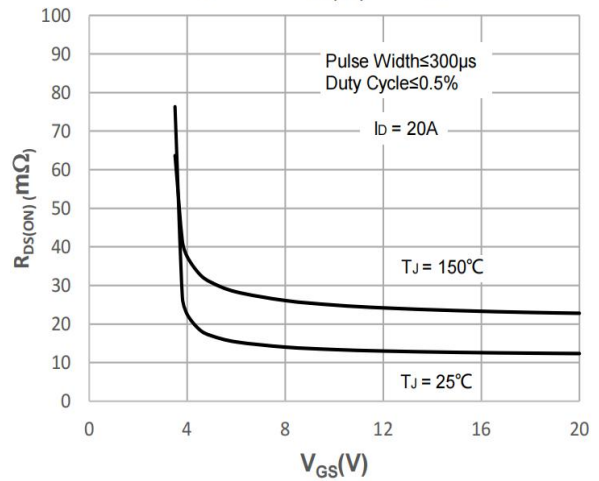
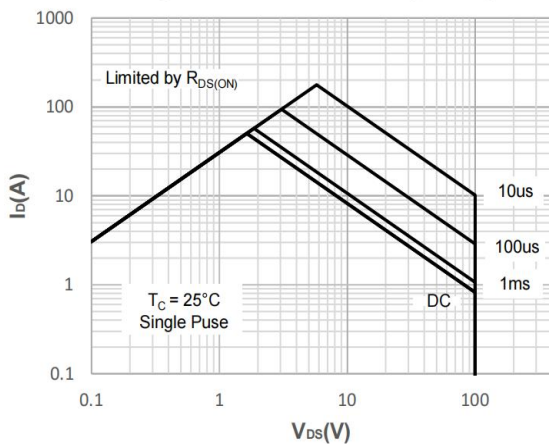
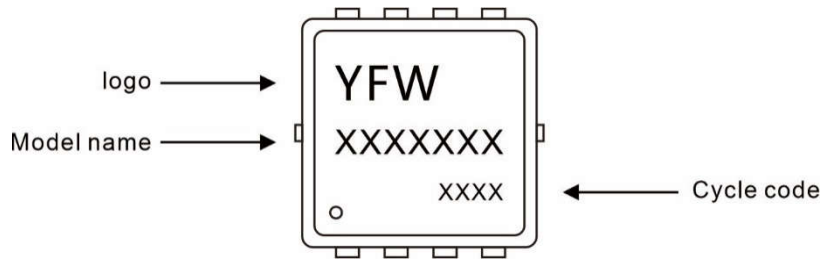


Figure 15: Maximum Safe Operating Area



Marking Diagram



Ordering information

Model name	Package	Unit Weight	Base Quantity	Packing Quantity
YFW50N10DF	PDFN3*3-8L	0.0023oz(0.065g)	5000pcs/reel	10000pcs/box 50000pcs/Carton

Package Dimensions

PDFN3*3-8L

Dim	Millimeter		mil	
	Min.	Max.	Min.	Max.
A	0.70	0.85	0.0276	0.0335
A1	-	0.05	-	0.002
b	0.20	0.40	0.008	0.016
c	0.10	0.25	0.004	0.010
D	3.15	3.45	0.124	0.136
D1	3.00	3.25	0.118	0.128
D2	2.29	2.65	0.09	0.104
E	3.15	3.45	0.124	0.136
E1	2.90	3.20	0.114	0.126
E2	1.54	1.94	0.061	0.076
E3	0.28	0.65	0.011	0.026
E4	0.37	0.77	0.015	0.030
E5	0.10	0.30	0.004	0.012
e	0.60	0.70	0.024	0.028
K	0.59	0.89	0.023	0.035
L	0.30	0.50	0.012	0.020
L1	0.06	0.20	0.002	0.008
t	-	0.13	-	0.005
Φ	10°C	14°C	10°C	14°C

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