

100V N-Channel Enhancement Mode Power MOSFET

MAIN CHARACTERISTICS

I_D	240A
V_{DSS}	100V
$R_{DS(on)-typ}(@V_{GS}=10V)$	$<2.9m\Omega$ (Typ: 2.3 mΩ)

APPLICATIONS

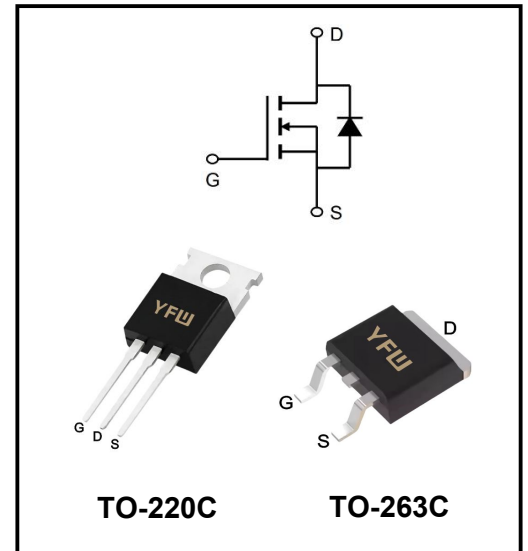
- ♦ Ultra-low RDS(ON)
- ♦ Low Gate Charge
- ♦ High Current Capability
- ♦ **YFW-SGT technology**

APPLICATIONS

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

MECHANICAL DATA

- ♦ Case: Molded plastic
- ♦ 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 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	240	A
Pulsed Drain Current (Note1)	I_{DM}	960	A
Total Power Dissipation	P_D	304	W
Single Pulse Avalanche Energy (Note1)	E_{AS}	529	mJ
Operating Junction Temperature Range	T_J	150	°C
Storage Temperature Range	T_{STG}	-55 to +150	°C
Thermal Resistance, Junction to Case	$R_{\theta JC}$	0.41	°C/W
Thermal Resistance, Junction to Ambient	$R_{\theta JA}$	52	°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
Gate Body Leakage Current	$V_{GS}=\pm 20V, V_{DS}=0V$	I_{GSS}	-	-	± 100	nA
Gate Threshold Voltage	$V_{DS}=V_{GS}, I_D=250\mu A$	$V_{GS(th)}$	2.0	-	4.0	V
Drain-Source on-Resistance	$V_{GS}=10V, I_D=20A$	$R_{DS(ON)}$	-	2.3	2.9	m Ω
Forward Transconductance	$V_{DS}=5V, I_D=20A$	g_{fs}	-	56.5	-	S
Input Capacitance	$V_{DS}=50V$ $V_{GS}=0V$ $f=1MHz$	C_{iss}	-	9500	-	pF
Output Capacitance		C_{oss}	-	1502	-	
Reverse Transfer Capacitance		C_{rss}	-	62	-	
Turn-on delay time	$V_{GS}=10V$ $V_{DS}=50V$ $R_G=3\Omega$ $R_L=2.5\Omega$	$t_{d(on)}$	-	25	-	ns
Rise Time		T_r	-	42	-	
Turn-Off Delay Time		$t_{d(OFF)}$	-	108	-	
Fall Time		t_f	-	62	-	
Total Gate Charge	$I_D = 20A$ $V_{DD} = 50V$ $V_{GS} = 10V$	Q_g	-	143	-	nC
Gate-Source Charge		Q_{gs}	-	44	-	
Gate-Drain Charge		Q_{gd}	-	32	-	
Maximun Body-Diode Continuous Current		I_S	-	-	240	A
Maximun Body-Diode Pulsed Current(Note2)		I_{SM}	-	-	960	A
Drain-Source Diode Forward Voltage	$I_{SD} = 20A$	V_{SD}	-	-	1.2	V
Body Diode Reverse Recovery Time(Note2)	$I_{SD} = 15A, V_{GS} = 0V,$ $dIF / dt = 100A/\mu s$	t_{rr}	-	98	-	ns
Body Diode Reverse Recovery Charge(Note2)		Q_{rr}	-	254	-	nC

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

Ratings and Characteristic Curves

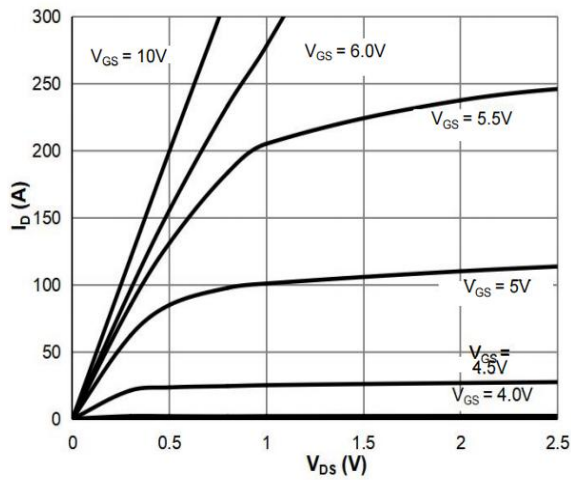


Figure 1: Saturation Characteristics

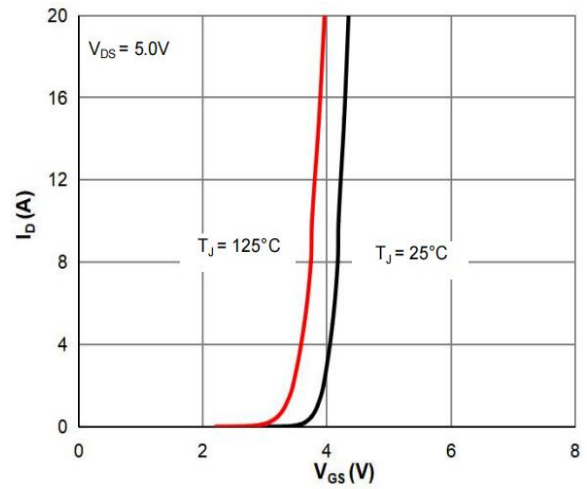


Figure 2: Transfer Characteristics

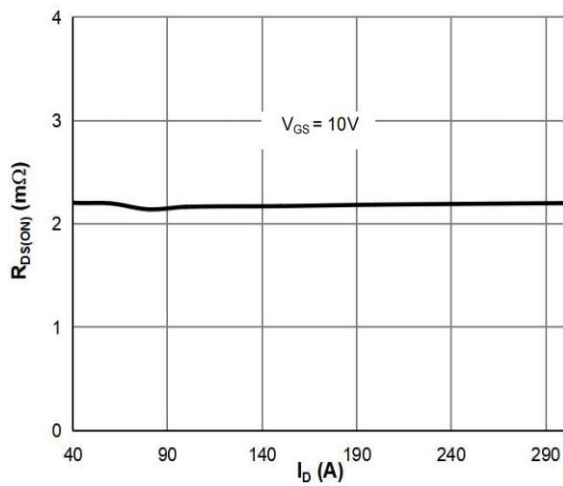


Figure 3: $R_{DS(ON)}$ vs. Drain Current

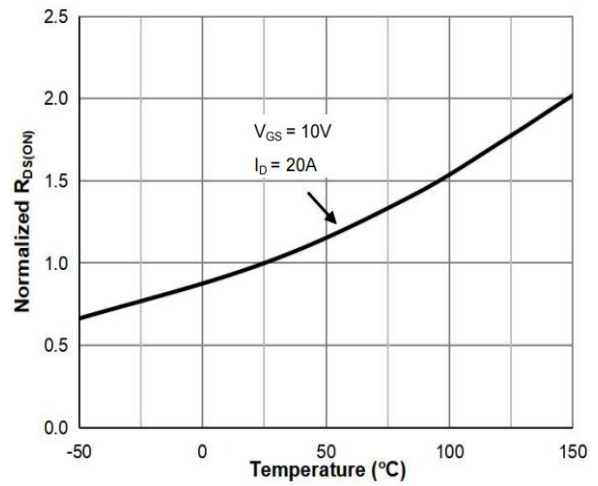


Figure 4: $R_{DS(ON)}$ vs. Junction Temperature

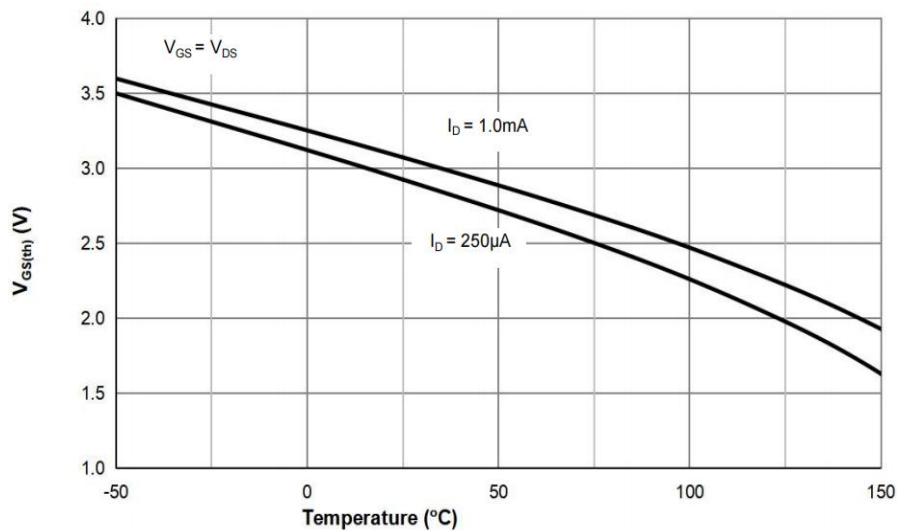


Figure 5: $V_{GS(th)}$ vs. Junction Temperature

Ratings and Characteristic Curves

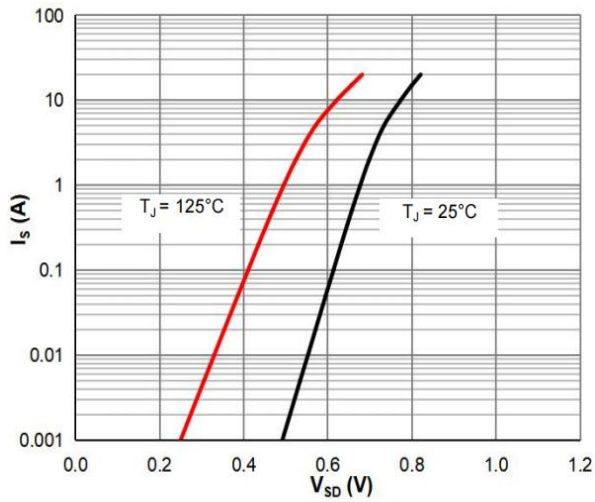


Figure 7: Body-Diode Characteristics

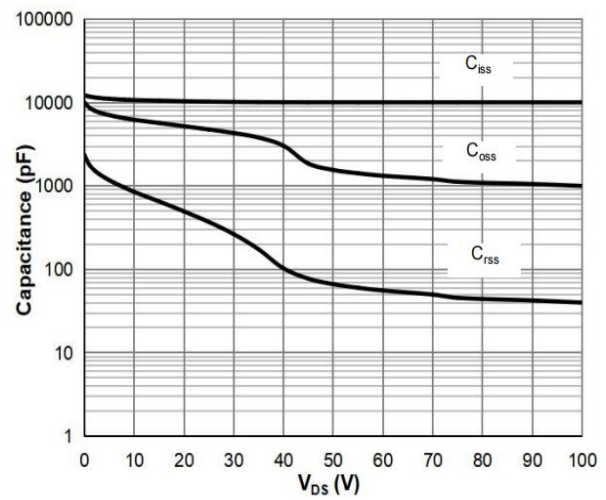


Figure 8: Capacitance Characteristics

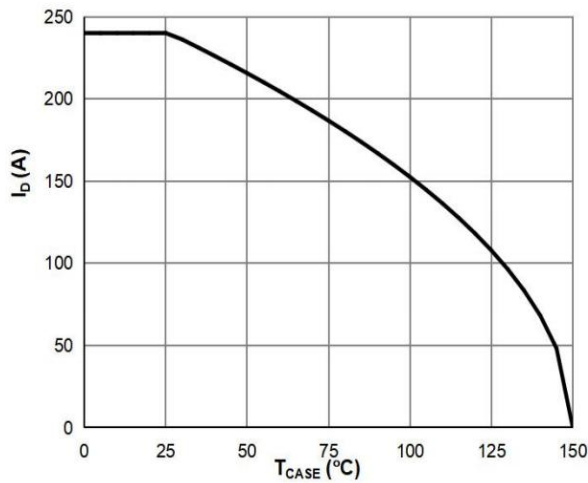


Figure 9: Current De-rating

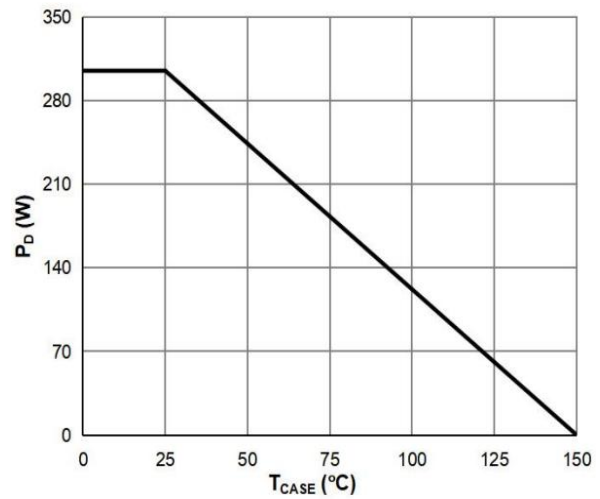


Figure 10: Power De-rating

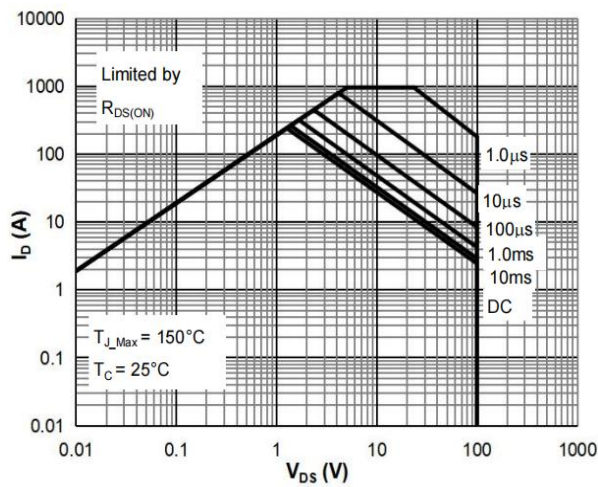


Figure 11: Maximum Safe Operating Area

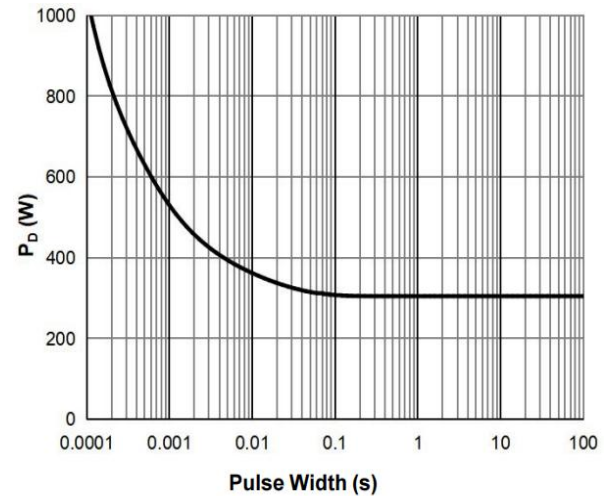
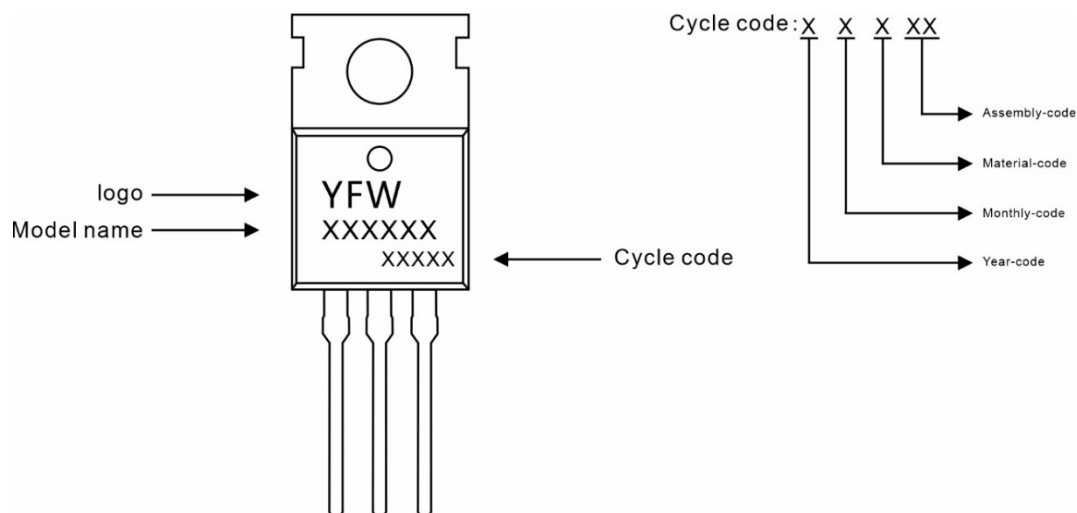


Figure 12: Single Pulse Power Rating, Junction-to-Case

Marking Diagram



Ordering information

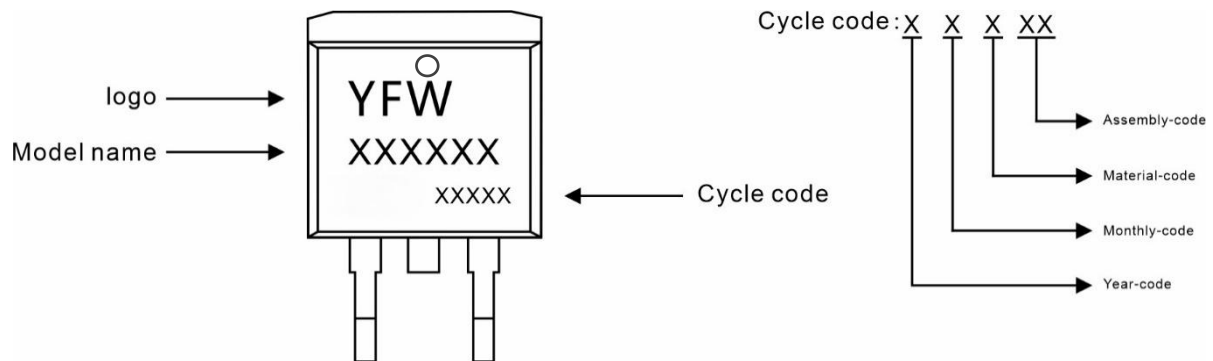
Model name	Package	Unit Weight	Base Quantity	Packing Quantity
YFWG240N10AC	TO-220C	0.07oz(1.96g)	50pcs/tube	1000PCS/Box 5000PCS/Carton

Package Dimensions

TO-220C

Dim	Millimeter		Inches	
	Min.	Max.	Min.	Max.
A	4.34	4.67	0.171	0.184
A1	2.52	2.82	0.099	0.111
b	0.71	0.91	0.028	0.036
b1	1.17	1.37	0.046	0.054
c	0.30	0.50	0.012	0.020
c1	1.17	1.37	0.046	0.054
D	9.90	10.20	0.390	0.402
E	8.50	8.90	0.335	0.350
E1	12.00	12.50	0.472	0.492
e	2.44	2.64	0.096	0.104
e1	4.88	5.28	0.192	0.208
F	2.60	2.80	0.102	0.110
L	13.20	13.80	0.520	0.543
L1	3.80	4.20	0.150	0.165
Φ	3.60	3.96	0.142	0.156

Marking Diagram



Ordering information

Model name	Package	Unit Weight	Base Quantity	Packing Quantity
YFWG240N10AC	TO-263C	0.04oz(1.16g)	800pcs/reel	1600pcs/box 8000pcs/Carton

Package Dimensions TO-263C

Dim	Millimeter		Inches	
	Min.	Max.	Min.	Max.
A	4.30	4.70	0.169	0.185
A1	0.00	0.15	0.000	0.006
A2	4.30	4.55	0.169	0.179
B	1.10	1.50	0.043	0.059
b	0.70	0.90	0.028	0.035
b1	1.20	1.50	0.047	0.059
c	0.30	0.60	0.012	0.024
c1	1.17	1.37	0.046	0.054
D	9.90	10.20	0.390	0.402
E	8.50	8.90	0.335	0.350
e	2.44	2.64	0.096	0.104
e1	4.88	5.28	0.192	0.208
L	15.00	15.30	0.591	0.602
L1	5.20	5.40	0.205	0.213
L2	2.40	2.60	0.094	0.102
L3	1.60	1.80	0.063	0.071

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