

100V N-CHANNEL SGT Power MOSFET

MAIN CHARACTERISTICS

I_D	60A
V_{DS}	100V
R_{DS(on)-typ}(@V_{GS}=10V)	<7.7mΩ (Typ:7mΩ)

FEATURES

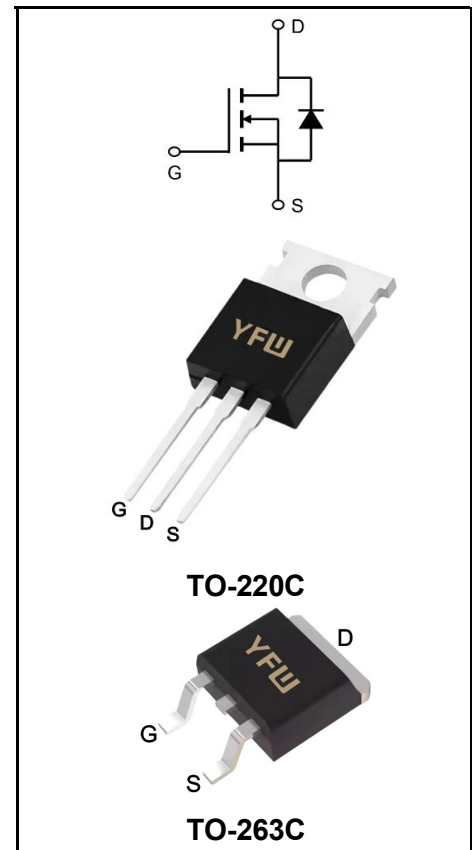
- ♦ **YFW-SGT technology**
- ♦ Best-in-Class FOM
- ♦ Low Gate Charge
- ♦ High Current Capability

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: TO-220C/AC TO-263C/ASC
- ♦ 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	Symbol	Value	Unit
Drain-Source Voltage	V _{DS}	100	V
Gate-Source Voltage	V _{GS}	±20	V
Continue Drain Current	I _D	60	A
Pulsed Drain Current (Note1)	I _{DM}	180	A
Power Dissipation	P _D	78	W
Single Pulse Avalanche Energy (Note1)	E _{AS}	94	mJ
Operating Temperature Range	T _J	150	°C
Storage Temperature Range	T _{STG}	-55 to +150	°C
Thermal Resistance, Junction to Case	R _{θJC}	1	°C/W
Thermal Resistance, Junction to Ambient	R _{θJA}	52	°C/W

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

Electrical Characteristics at Tc=25°C unless otherwise specified

Characteristics	Test Condition	Symbol	Min	Typ	Max	Unit
Drain-Source Breakdown Voltage	$V_{GS} = 0\text{ V}, I_D = 250\mu\text{A}$	BV_{DSS}	100	-	-	V
Drain-Source Leakage Current	$V_{DS} = 100\text{ V}, V_{GS} = 0\text{ V}$	I_{DSS}	-	-	1	μA
	$V_{DS}=100\text{ V}, T_c=125^\circ\text{C}$		-	-	100	μA
Gate Leakage Current	$V_{GS} = \pm 20\text{ V}, V_{DS} = 0\text{ V}$	I_{GSS}	-	-	± 100	nA
Gate-Source Threshold Voltage	$V_{DS} = V_{GS}, I_D = 250\mu\text{A}$	$V_{GS(th)}$	1.2	-	2.5	V
Drain-Source On-State Resistance	$V_{GS} = 10\text{ V}, I_D = 20\text{ A}$	$R_{DS(on)}$	-	7	7.7	m Ω
	$V_{GS} = 4.5\text{ V}, I_D = 15\text{ A}$		-	9.3	11.6	m Ω
Input Capacitance	$V_{GS} = 0\text{ V}$ $V_{DS} = 50\text{ V}$ $f = 1\text{ MHz}$	C_{iss}	-	1950	-	pF
Output Capacitance		C_{oss}	-	731	-	
Reverse Transfer Capacitance		C_{rss}	-	30	-	
Turn-on Delay Time	$V_{DS}=50\text{ V}$ $V_{GS}=10\text{ V}$ $R_L=2.5\Omega$ $R_G=3\Omega$	$t_{d(ON)}$	-	10.7	-	ns
Rise Time		t_r	-	21	-	
Turn-Off Delay Time		$t_{d(OFF)}$	-	31	-	
Fall Time		t_f	-	10.5	-	
Total Gate Charge	$V_{DS}=50\text{ V},$ $I_D=20\text{ A},$ $V_{GS}=10\text{ V}$	Q_G	-	35.8	-	nC
Gate to Source Charge		Q_{GS}	-	7.8	-	
Gate to Drain Charge		Q_{GD}	-	8.8	-	
Maximun Body-Diode Continuous Current (Note 2)		I_S	-	-	60	A
Maximun Body-Diode Pulsed Current		I_{SM}	-	-	180	A
Drain-Source Diode Forward Voltage	$V_{GS}=0\text{ V}, I_S=1\text{ A}, T_J=25^\circ\text{C}$	V_{SD}	-	-	1.2	V
Reverse Recovery Time	$I_S = I_F, I_{SD}=20\text{ A}, V_{GS} = 0\text{ V},$ $dI / dt = 100\text{ A}/\mu\text{s}$	t_{rr}	-	40	-	ns
Reverse Recovery Charge		Q_{rr}	-	41	-	nC

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

RATINGS AND CHARACTERISTIC CURVES

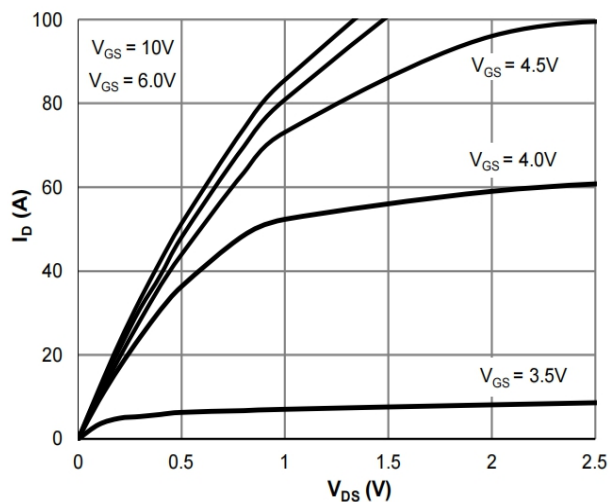


Figure 1: Saturation Characteristics

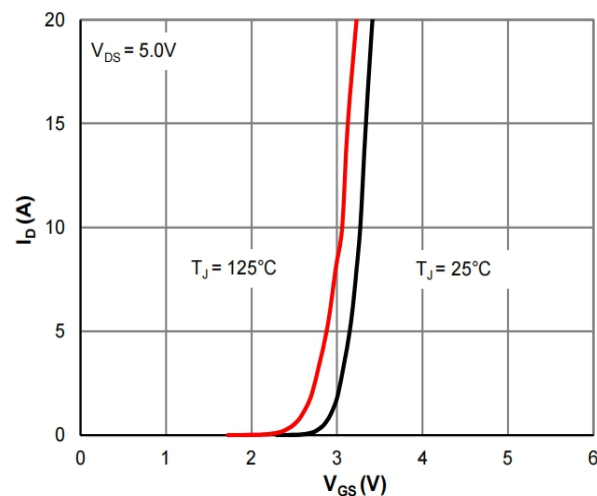


Figure 2: Transfer Characteristics

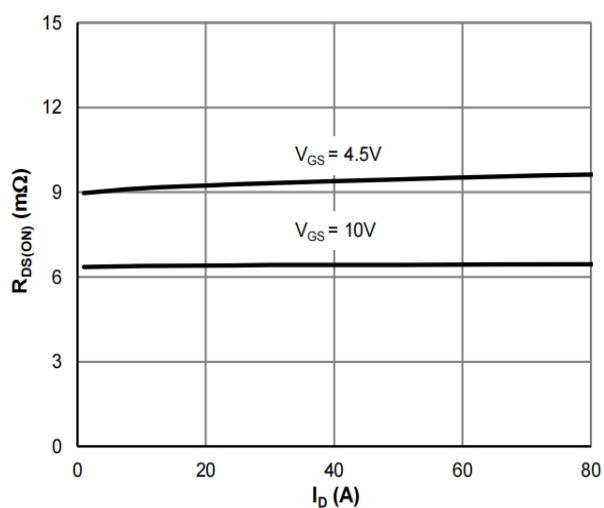


Figure 3: $R_{DS(ON)}$ vs. Drain Current

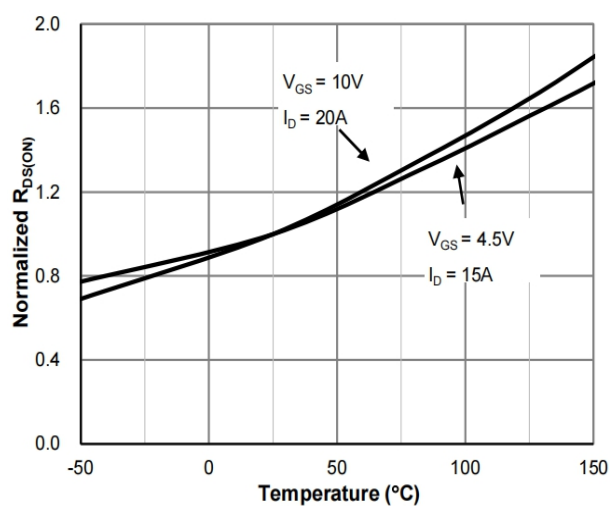


Figure 4: $R_{DS(ON)}$ vs. Junction Temperature

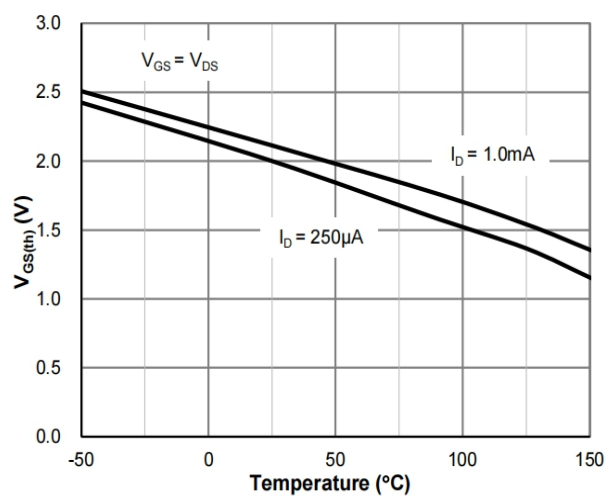


Figure 5: $V_{GS(th)}$ vs. Junction Temperature

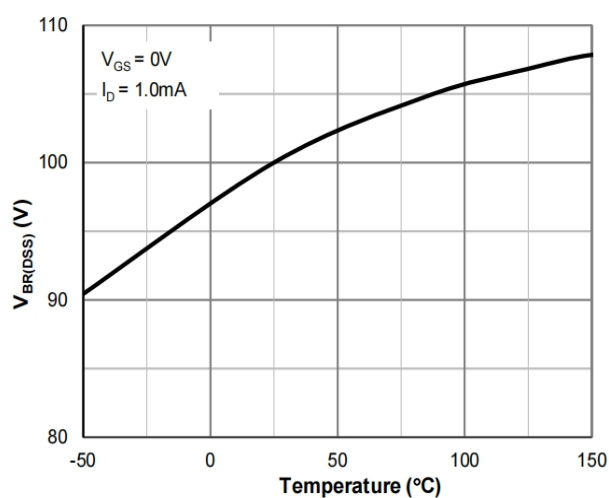


Figure 6: $V_{BR(DSS)}$ vs. Junction Temperature

RATINGS AND CHARACTERISTIC CURVES

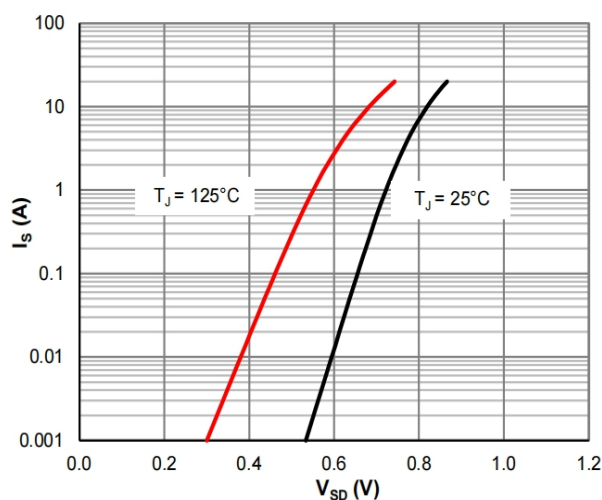


Figure 7: Body-Diode Characteristics

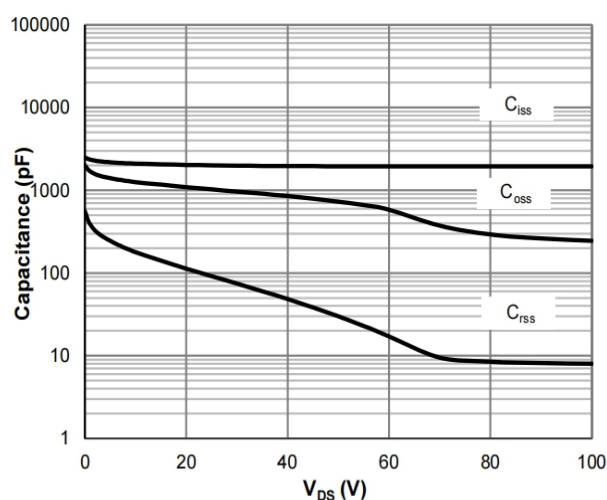


Figure 8: Capacitance Characteristics

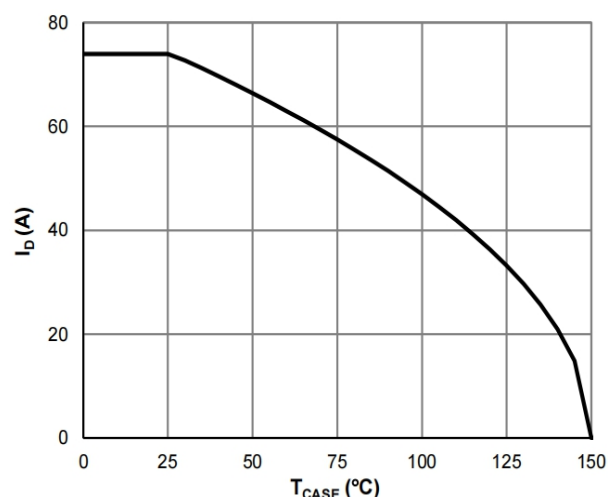


Figure 9: Current De-rating

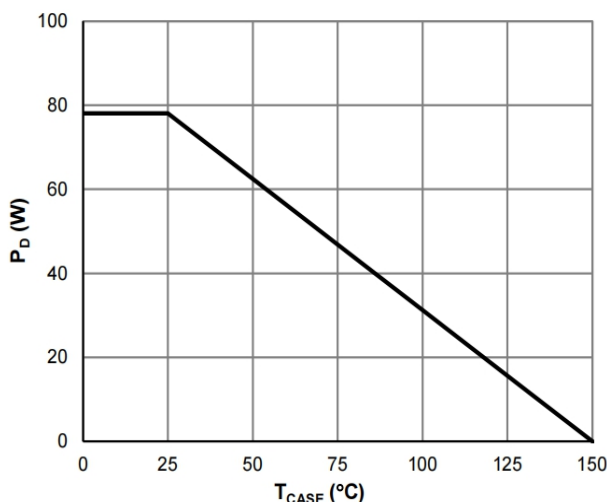


Figure 10: Power De-rating

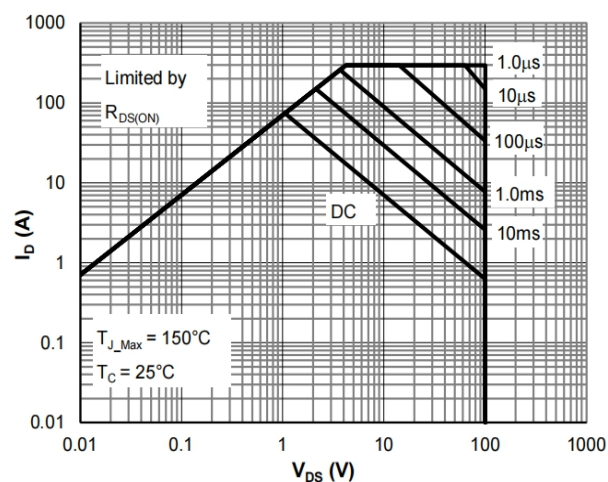


Figure 11: Maximum Safe Operating Area

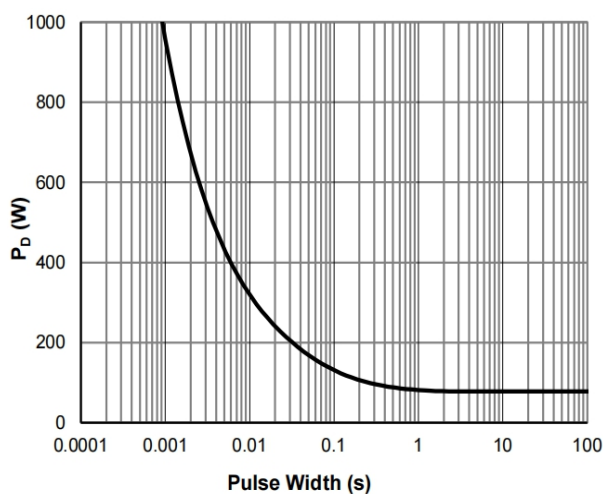
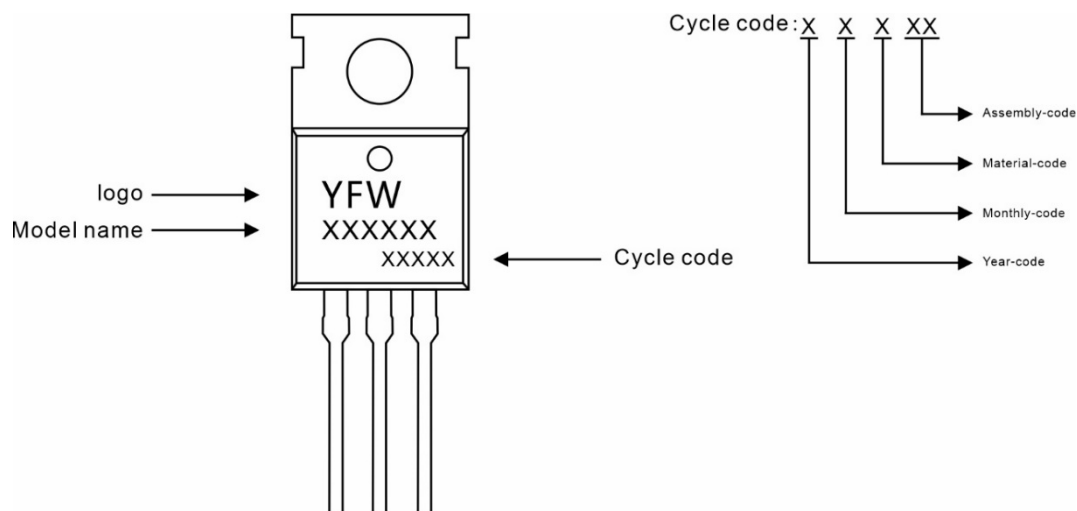


Figure 12: Single Pulse Power Rating, Junction-to-Case

Marking Diagram



Ordering information

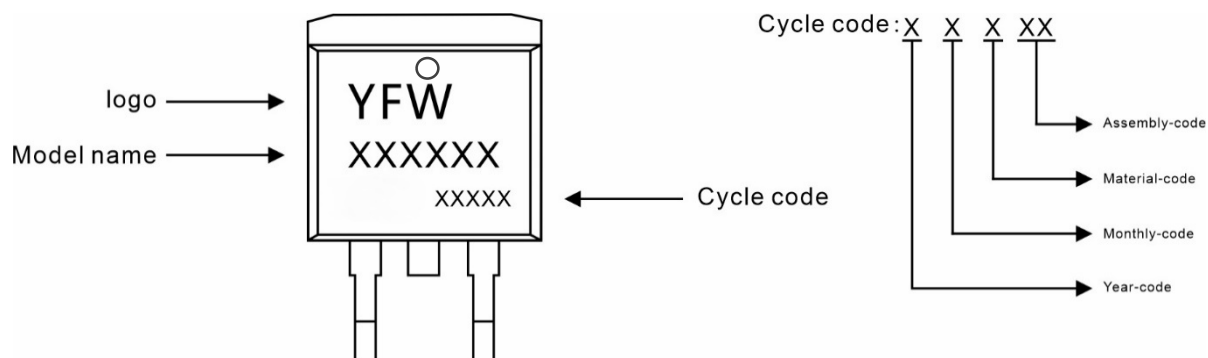
Model name	Package	Unit Weight	Base Quantity	Packing Quantity
YFWG60N10AC	TO-220C	0.07oz(1.96g)	50pcs/tube	1000PCS/Box 5000PCS/Carton

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
YFWG60N10ASC	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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