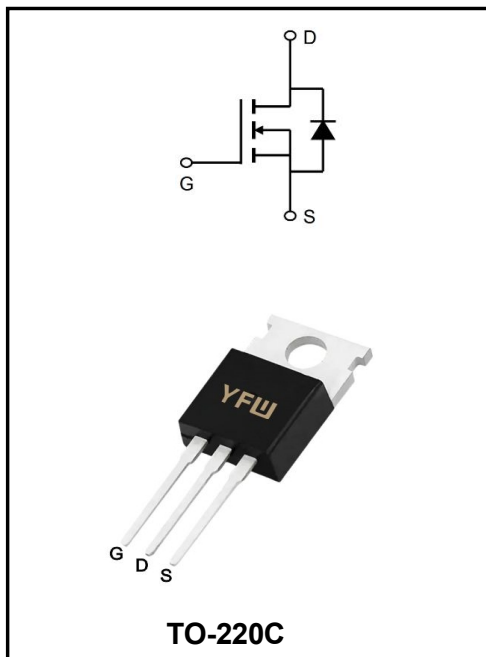


60V N-Channel SGT Power MOSFET

MAIN CHARACTERISTICS

I_D	220A
V_{DS}	60V
$R_{DS(on)-typ}(@V_{GS}=10V)$	$<2.0m\Omega$ (Typ:1.6m Ω)



FEATURES

- ♦SGT Power MOS
- ♦Low RDS(on)
- ♦Low Gate Charge
- ♦YFW-SGT technology

APPLICATIONS

- ♦Battery protection
- ♦Uninterruptible Power Supply(UPS)

MECHANICAL DATA

- ♦Case: TO-220C/AC
- ♦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

Absolute Maximum Ratings (Ta=25°C, Unless Otherwise Specified)

Characteristics	Symbols	Value	Units
Drain-Source Voltage	V_{DS}	60	V
Gate - Source Voltage	V_{GS}	± 20	V
Continue Drain Current	I_D	220	A
Pulsed Drain Current (Note1)	I_{DM}	880	A
Power Dissipation	P_D	138	W
Single Pulse Avalanche Energy	E_{AS}	150	mJ
Operating Junction Temperature Range	T_J	150	°C
Storage Temperature Range	T_{STG}	-55 to +150	°C
Thermal Resistance Junction Case	$R_{\theta JC}$	0.41	°C/W
Thermal Resistance, Junction-to-Ambient	$R_{\theta JA}$	52	°C/W

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

Electrical Characteristics at Tc=25°C unless otherwise specified

Parameter	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}	60	-	-	V
Drain-Source Leakage Current	$V_{DS} = 60\text{ V}, V_{GS} = 0\text{ V}$	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	$V_{DS} = V_{GS}, I_D = 250\text{ }\mu\text{A}$	$V_{GS(th)}$	2.2	-	3.8	V
Drain-Source On-State Resistance	$V_{GS} = 10\text{ V}, I_D = 50\text{ A}$	$R_{DS(on)}$	-	1.6	2.0	m Ω
Forward Transconductance	$V_{DS} = 5\text{ V}, I_D = 25\text{ A}$	g_{fs}	-	87	-	S
Input Capacitance	$V_{GS} = 0\text{ V}$ $V_{DS} = 30\text{ V}$ $f = 1\text{ MHz}$	C_{iss}	-	6970	-	pF
Output Capacitance		C_{oss}	-	1397	-	
Reverse Transfer Capacitance		C_{rss}	-	58	-	
Turn-on Delay Time(Note2)	$V_{GS}=10\text{ V}$ $V_{DS}=30\text{ V}$ $R_G=3\text{ }\Omega$ $I_D = 50\text{ A}$	$t_{d(on)}$	-	15	-	ns
Rise Time(Note2)		T_r	-	27	-	
Turn-Off Delay Time(Note2)		$t_{d(OFF)}$	-	62	-	
Fall Time(Note2)		t_f	-	50	-	
Total Gate Charge(Note2)	$I_D = 50\text{ A},$ $V_{DS} = 30\text{ V},$ $V_{GS} = 10\text{ V}$	Q_g	-	97	-	nC
Gate to Source Charge(Note2)		Q_{gs}	-	34	-	
Gate to Drain Charge(Note2)		Q_{gd}	-	18	-	
Maximun Body-Diode Continuous Current		I_S	-	-	220	A
Maximun Body-Diode Pulsed Current(Note2)		I_{SM}	-	-	880	A
Drain-Source Diode Forward Voltage	$I_{SD} = 50\text{ A}$	V_{SD}	-	-	1.2	V
Reverse Recovery Time(Note2)	$I_{SD} = 50\text{ A}, V_{GS} = 0\text{ V},$ $dI_F / dt = 100\text{ A}/\mu\text{s}$	t_{rr}	-	80	-	ns
Reverse Recovery Charge(Note2)		Q_{rr}	-	115	-	nC

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

Ratings And Characteristic Curves

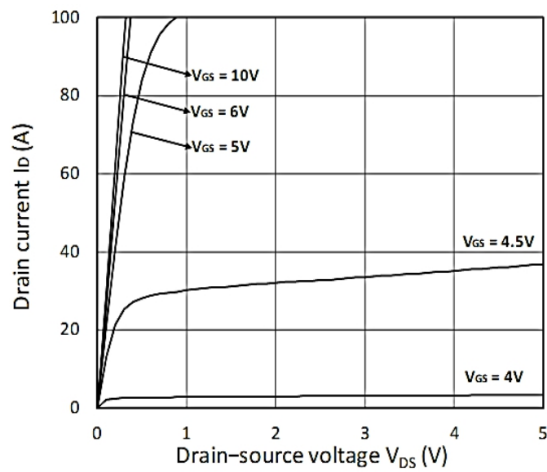


Figure 1. Output Characteristics

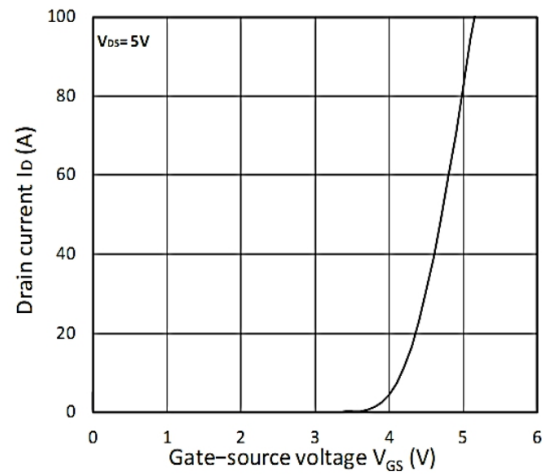


Figure 2. Transfer Characteristics

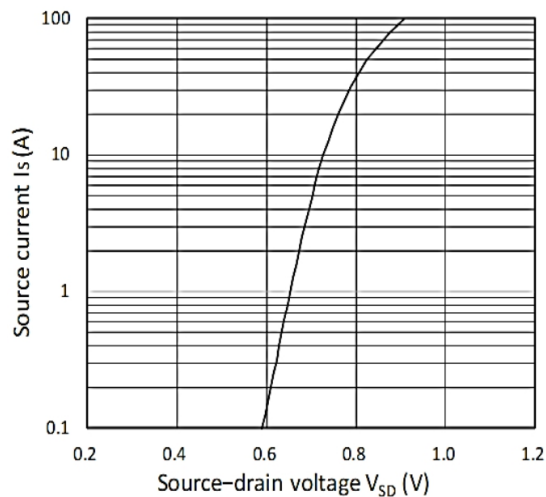


Figure 3. Forward Characteristics of Reverse

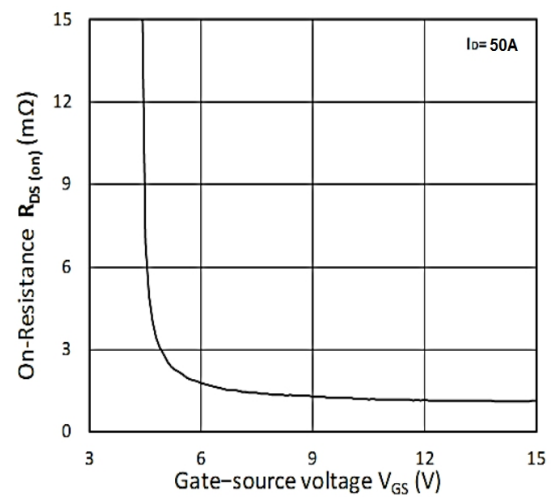


Figure 4. R_DS(ON) vs. V_GS

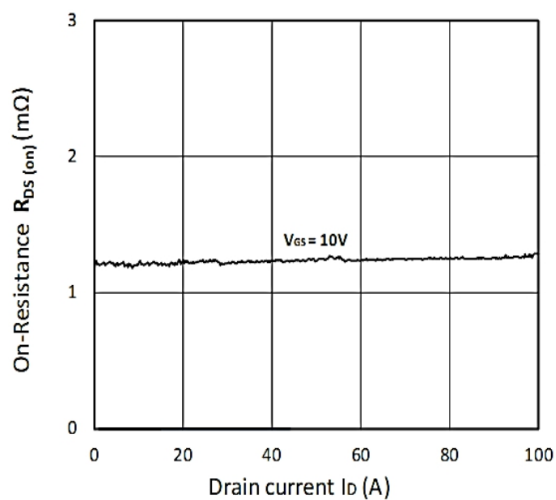


Figure 5. R_DS(ON) vs. I_D

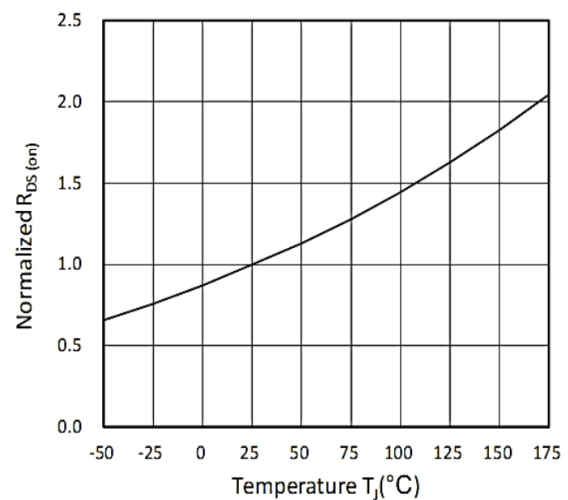


Figure 6. Normalized R_DS(on) vs. Temperature

Test Circuits and waveforms

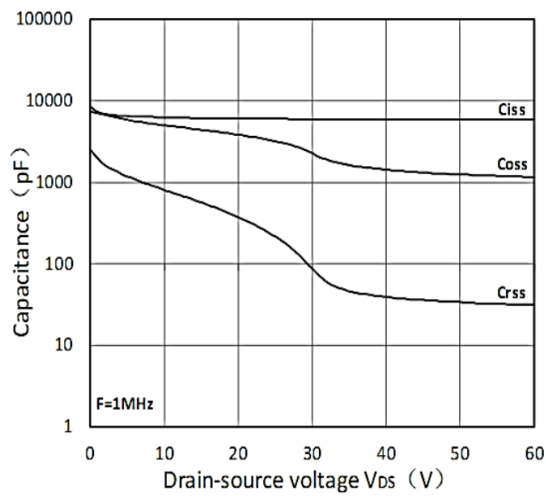


Figure 7. Capacitance Characteristics

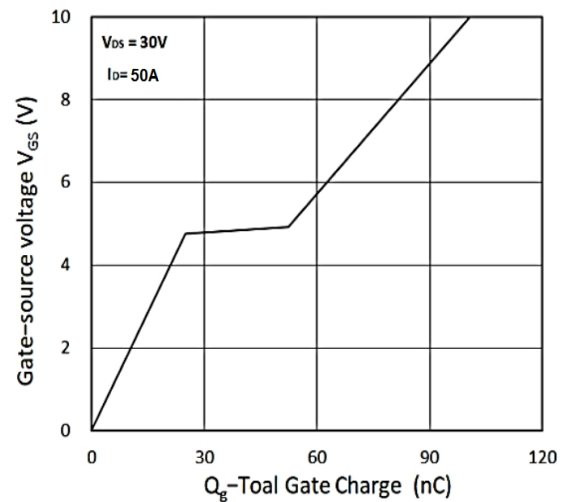


Figure 8. Gate Charge Characteristics

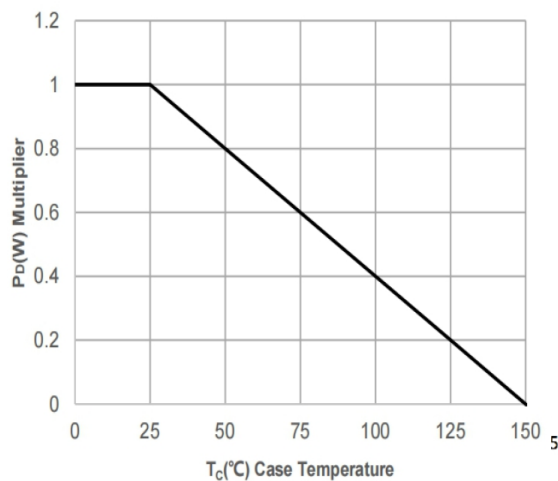


Figure 9. Power Dissipation

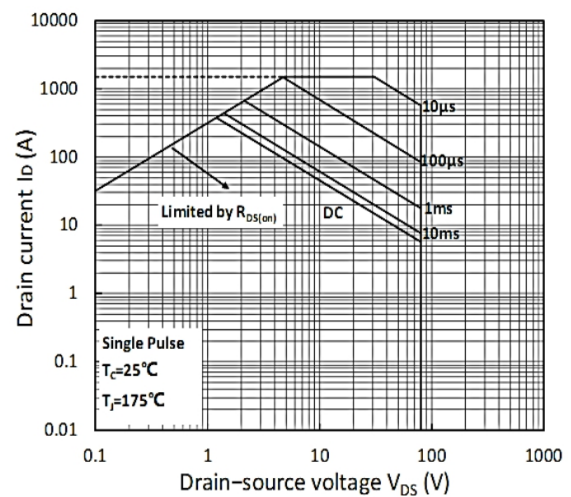


Figure 10. Safe Operating Area

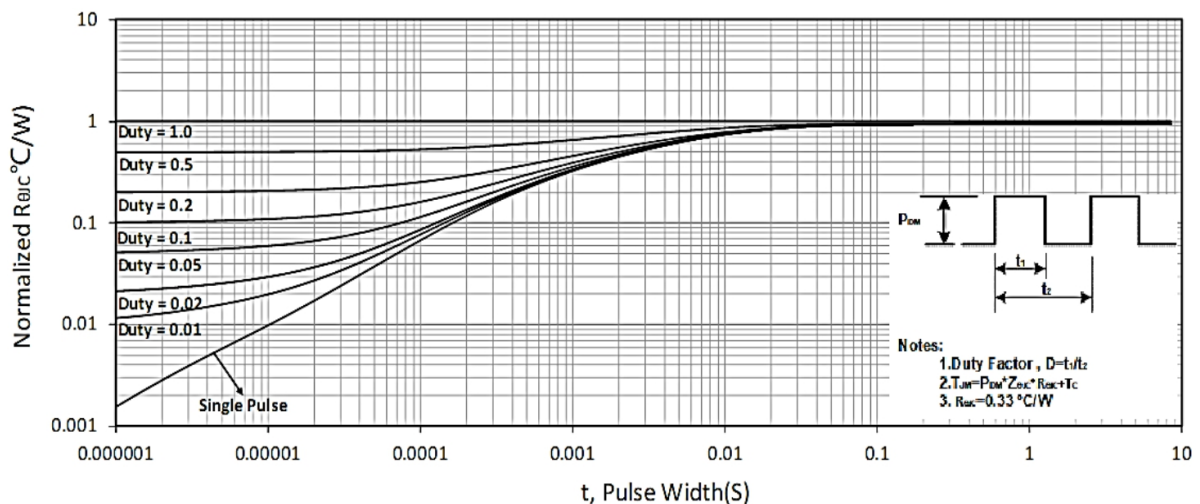
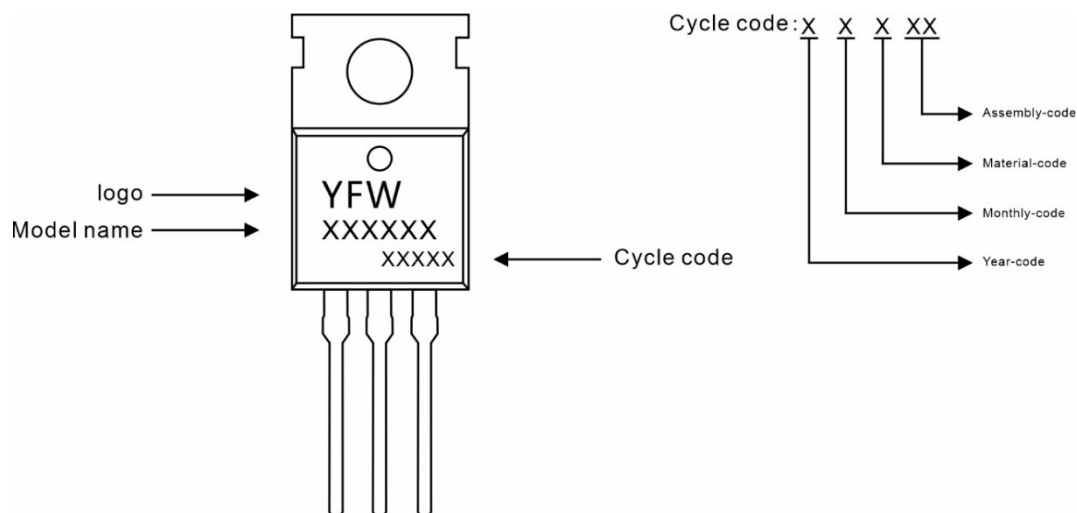


Figure 11. Normalized Maximum Transient Thermal Impedance

Marking Diagram



Ordering information

Model name	Package	Unit Weight	Base Quantity	Packing Quantity
YFWG220N06HAC	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

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