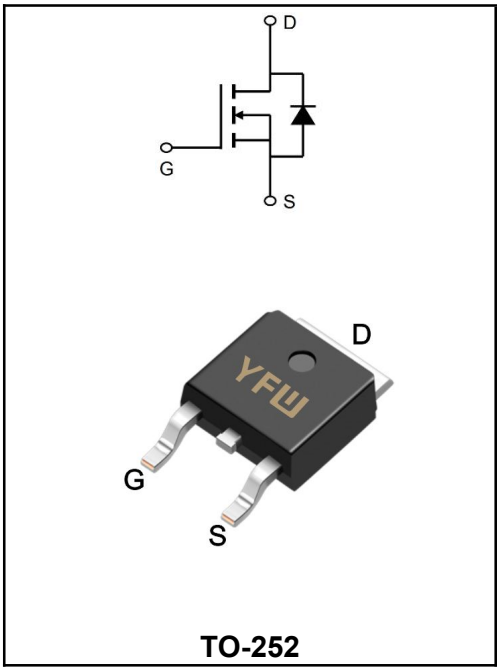
60V N- Channel SGT Power MOSFET

MAIN CHARACTERISTICS

I_D	160A
V_{DS}	60V
R_{DSON}-typ(@V_{GS}=10V)	<2.6mΩ(Typ:2.0mΩ)



TO-252

FEATURES

- High ruggedness
- Fast switching
- 100% avalanche tested
- Improved dv/dt capability

APPLICATIONS

- PWM Application
- Load Switch
- Power Management
- **YFW-SGT technology**

MECHANICAL DATA

- Case: TO-252/AD
- 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℃ maximum,10s per JESD 22-B106

Maximum Ratings at Tc=25°C unless otherwise specified

Characteristics	Symbol	Value	Unit
Drain-Source Voltage	V_{DS}	60	V
Gate-Source Voltage	V_{GS}	±20	V
Continue Drain Current	I_D	160	A
Pulsed Drain Current (Note1)	I_{DM}	480	A
Power Dissipation	P_D	170	W
Single Pulse Avalanche Energy (Note1)	E_{AS}	270	mJ
Operating Temperature Range	T_J	150	°C
Storage Temperature Range	T_{STG}	-55 to +150	°C
Thermal Resistance, Junction to Case	$R_{\theta JC}$	0.39	°C/W
Thermal Resistance, Junction toAmbient	$R_{\theta JA}$	62.5	°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 V,I_D = 250 μA	BV_{DSS}	60	-	-	V
Drain-Source Leakage Current	V_{DS} = 60 V, V_{GS} = 0 V	I_{DSS}	-	-	1	μA
Gate Leakage Current	V_{GS} = ± 20 V, V_{DS} = 0 V	I_{GSS}	-	-	±100	nA
Gate-Source Threshold Voltage	V_{DS} = V_{GS} , I_D = 250 μA	$V_{GS(th)}$	1.1	-	2.1	V
Drain-Source On-State Resistance	V_{GS} = 10 V, I_D = 30A	$R_{DS(on)}$	-	2.0	2.6	mΩ
	V_{GS} = 4.5V, I_D = 20A		-	2.6	3.4	mΩ
Input Capacitance	V_{GS} = 0 V V_{DS} = 25 V f =500KHz	C_{iss}	-	5460	-	pF
Output Capacitance		C_{oss}	-	1290	-	pF
Reverse Transfer Capacitance		C_{rss}	-	13	-	pF
Turn-on Delay Time	V_{DS}=30V I_D=60A V_{GS}=10V RG=4.7Ω	$t_{d(ON)}$	-	20	-	ns
Rise Time		t_r	-	127	-	ns
Turn-Off Delay Time		$t_{d(OFF)}$	-	95	-	ns
Fall Time		t_f	-	25	-	ns
Total Gate Charge	V_{DS}=30V I_D=30A V_{GS}=10V	Q_G	-	86	-	nC
Gate to Source Charge		Q_{GS}	-	14	-	nC
Gate to Drain Charge		Q_{GD}	-	14	-	nC
Maximun Body-Diode Continuous Current		I_S	-	-	160	A
Maximun Body-Diode Pulsed Current(Note2)		I_{SM}	-	-	480	A
Drain-Source Diode Forward Voltage	V_{GS}=0V , I_S=30A , T_J=25℃	V_{SD}	-	-	1.4	V
Reverse Recovery Time(Note2)	I_S = I_F, I_{SD}=30A,V_{GS} = 0 V, dI / dt = 100 A/μs (Note3)	trr	-	63	-	ns
Reverse Recovery Charge(Note2)		Qrr	-	59	-	nC

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

RATINGS AND CHARACTERISTIC CURVES

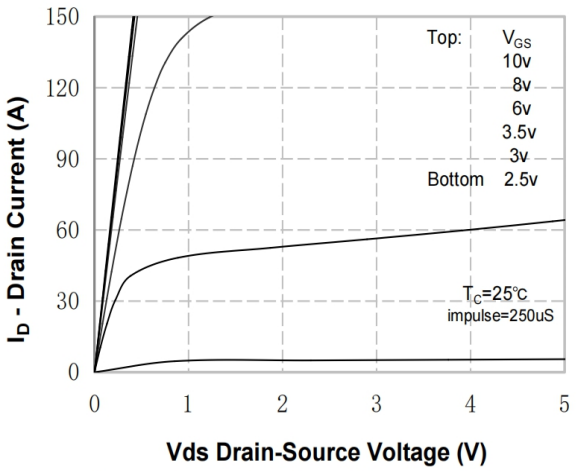


Figure 1. On-Region Characteristics

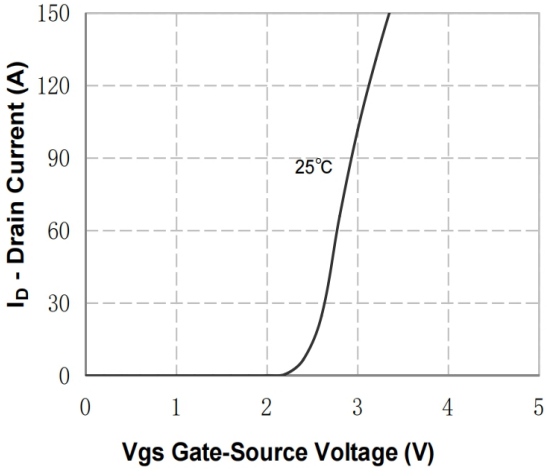


Figure 2. Transfer Characteristics

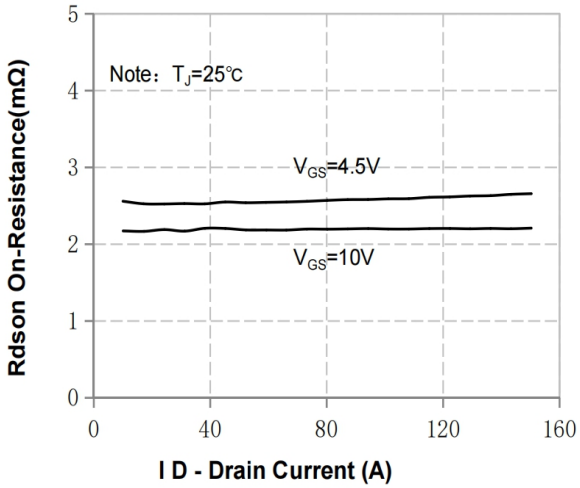


Figure 3. On-Resistance Variation vs Drain Current and Gate Voltage

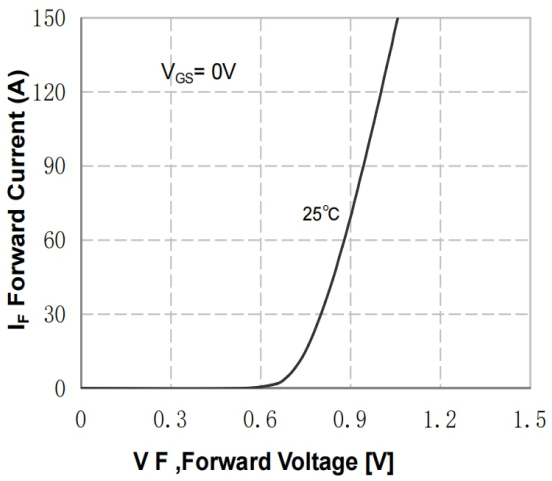


Figure 4. Body Diode Forward Voltage Variation with Source Current

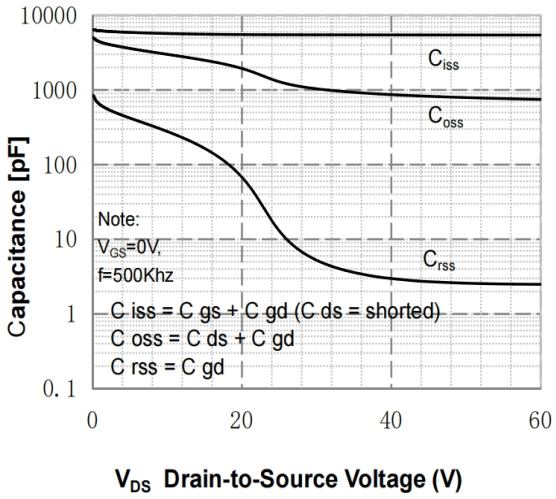


Figure 5. Capacitance Characteristics

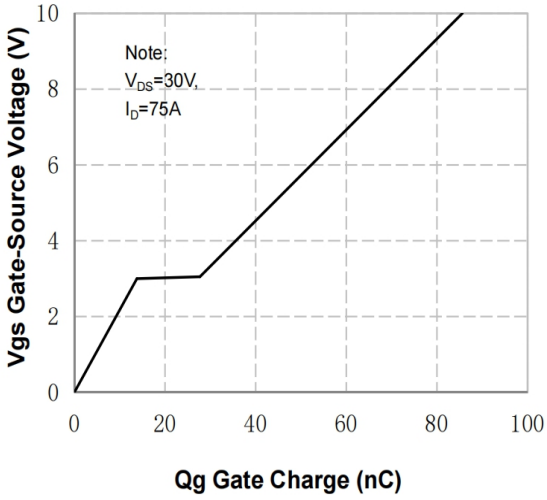


Figure 6. Gate Charge Characteristics

RATINGS AND CHARACTERISTIC CURVES

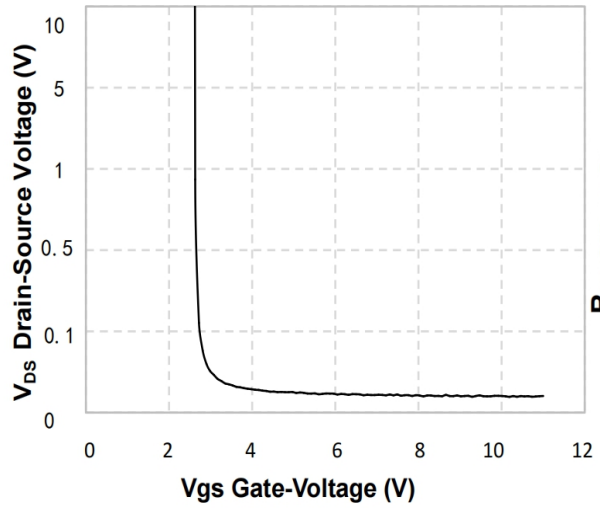


Figure 7. V_{DS} Drain-Source Voltage vs Gate Voltage

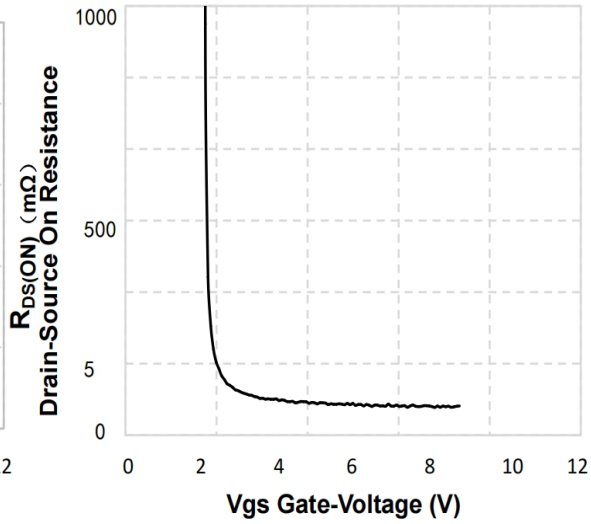


Figure 8. On-Resistance vs Gate Voltage

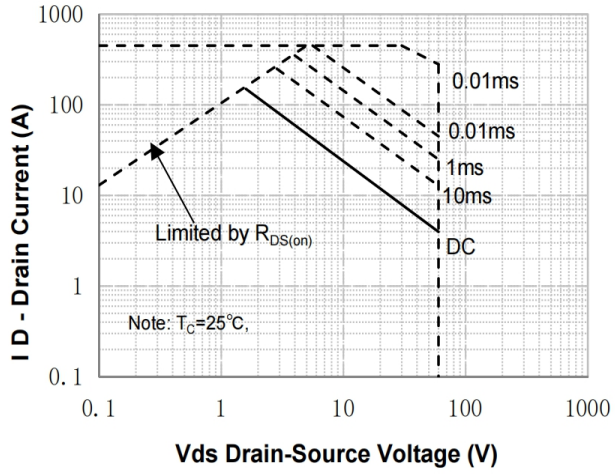


Figure 9. Maximum Safe Operating Area

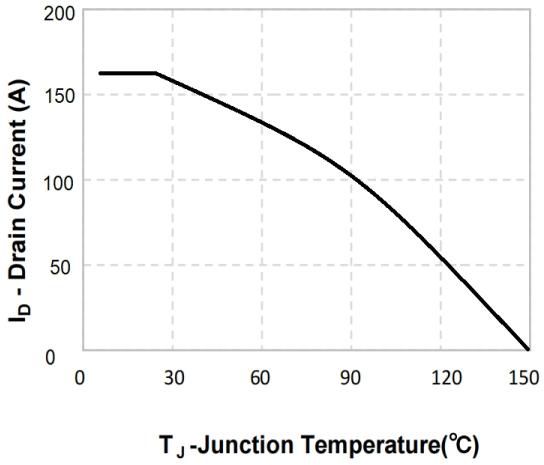


Figure 10. Maximum Continuous Drain Current vs Temperature

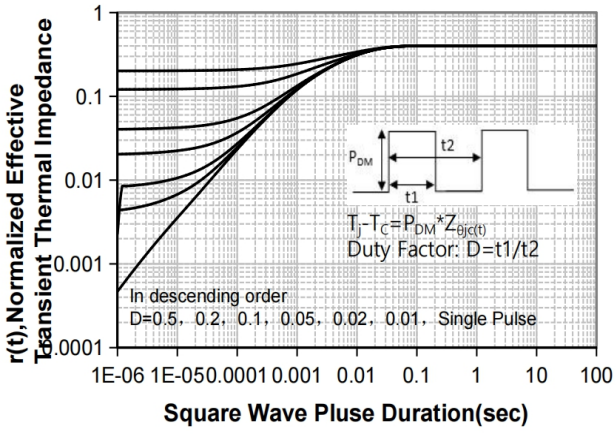
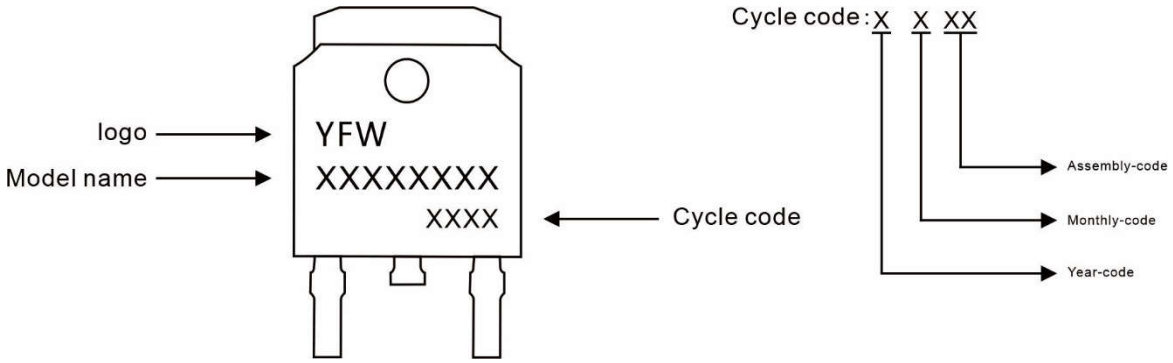


Figure 11. Transient Thermal Response Curve

Marking Diagram

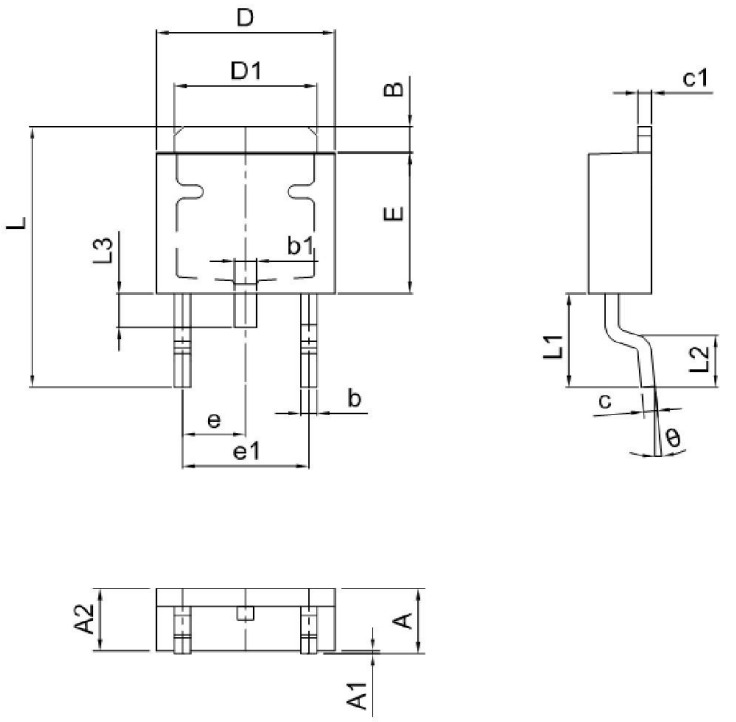


Ordering information

Model name	Package	Unit Weight	Base Quantity	Packing Quantity
YFWG160N06AD	TO-252	0.011oz(0.32g)	2500pcs/reel	5000pcs/box 25000pcs/Carton

Package Dimensions

TO-252



Dim	Millimeter		Inches	
	Min.	Max.	Min.	Max.
A	2.20	2.50	0.087	0.098
A1	0.00	0.12	0.000	0.005
A2	2.20	2.40	0.087	0.094
B	1.20	1.60	0.047	0.063
b	0.50	0.70	0.020	0.028
b1	0.70	0.90	0.028	0.035
c	0.40	0.60	0.016	0.024
c1	0.40	0.60	0.016	0.024
D	6.35	6.65	0.250	0.262
D1	5.20	5.40	0.205	0.213
E	5.40	5.70	0.213	0.224
e	2.20	2.40	0.087	0.094
e1	4.40	4.80	0.173	0.189
L	10.00	11.00	0.393	0.433
L1	2.70	3.10	0.106	0.122
L2	1.40	1.80	0.055	0.071
L3	0.90	1.50	0.035	0.059

Disclaimer

The information presented in this document is for reference only. GuangDong Youfeng Microelectronics Co.,Ltd. reserves the right to make changes without notice for the specification of the products displayed herein to improve reliability, function or design or otherwise. The product listed herein is designed to be used with ordinary electronic equipment or devices, and not designed to be used with equipment or devices which require high level of reliability and the malfunction of with would directly endanger human life (such as medical instruments, transportation equipment, aerospace machinery, nuclear-reactor controllers, fuel controllers and other safety devices),YFW or anyone on its behalf, assumes no responsibility or liability for any damages resulting from such improper use of sale. This publication supersedes & replaces all information previously supplied. For additional information, please visit our website https://www.yfwdiode.com, or consult YFW sales office for further assistance.