

60V N-Channel Shield Trench Power MOSFET

MAIN CHARACTERISTICS

I_D	80A
V_{DS}	60V
$R_{DS(on)-typ}(@V_{GS}=10V)$	<6.2m Ω (Typ:4.8m Ω)

FEATURES

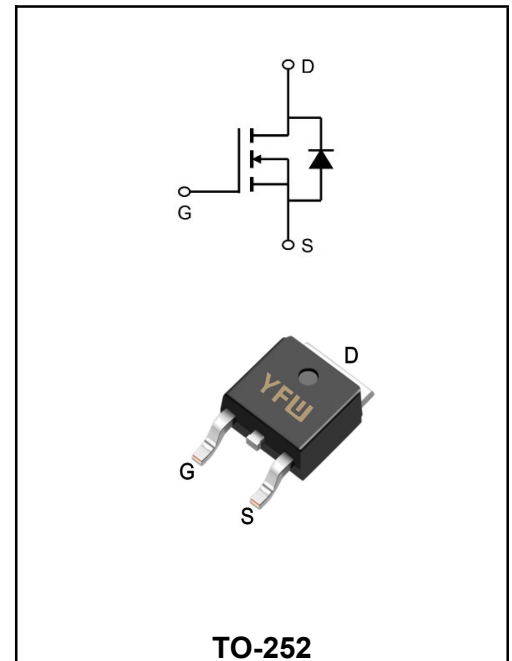
Adopt advanced trench technology to provide excellent $R_{DS(on)}$, low gate charge and operation with gate voltages as low as 4.5V. This device is suitable for use as a Battery protection or in other Switching application.

APPLICATIONS

- ◆ Battery protection
- ◆ Load switch
- ◆ Uninterruptible power supply
- ◆ 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°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}	60	V
Gate-Source Voltage	V_{GS}	±20	V
Continue Drain Current	I_D	80	A
Pulsed Drain Current (Note1)	I_{DM}	320	A
Power Dissipation	P_D	110	W
Single Pulse Avalanche Energy (Note1)	E_{AS}	140	mJ
Operating Temperature Range	T_J	150	°C
Storage Temperature Range	T_{STG}	-55 to +175	°C
Thermal Resistance, Junction to Case	$R_{\theta JC}$	2.1	°C/W
Thermal Resistance, Junction to Ambient	$R_{\theta JA}$	62	°C/W

Note1: Pulse test: 300 μ s 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	$V_{GS} = 0\text{ V}, I_D = 250\text{ }\mu\text{A}$	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	$V_{DS} = V_{GS}, I_D = 250\text{ }\mu\text{A}$	$V_{GS(th)}$	1.1	-	2.1	V
Drain-Source On-State Resistance	$V_{GS} = 10\text{ V}, I_D = 6\text{ A}$	$R_{DS(on)}$	-	4.8	6.2	m Ω
	$V_{GS} = 4.5\text{ V}, I_D = 6\text{ A}$		-	6.2	8	m Ω
Input Capacitance	$V_{DS} = 15\text{ V}$ $V_{GS} = 0\text{ V}$ $f = 1\text{ MHz}$	C_{iss}	-	3850	-	pF
Output Capacitance		C_{oss}	-	269	-	pF
Reverse Transfer Capacitance		C_{rss}	-	25	-	pF
Turn-on Delay Time(Note2)	$V_{DD} = 30\text{ V}$ $V_{GS} = 10\text{ V}$ $R_G = 2\Omega$ $I_D = 30\text{ A}$	$t_{d(ON)}$	-	18	-	ns
Rise Time(Note2)		t_r	-	170	-	ns
Turn-Off Delay Time(Note2)		$t_{d(OFF)}$	-	464	-	ns
Fall Time(Note2)		t_f	-	140	-	ns
Total Gate Charge(Note2)	$V_{DS} = 30\text{ V}$ $V_{GS} = 10\text{ V}$ $I_D = 30\text{ A}$	Q_G	-	12	-	nC
Gate to Source Charge(Note2)		Q_{GS}	-	13	-	nC
Gate to Drain Charge(Note2)		Q_{GD}	-	68	-	nC
Maximun Body-Diode Continuous Current		I_S	-	-	80	A
Maximun Body-Diode Pulsed Current(Note2)		I_{SM}	-	-	320	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(Note2)	$I_{SD} = 30\text{ A}, V_{GS} = 0\text{ V},$ $dI / dt = 100\text{ A}/\mu\text{s}$	t_{rr}	-	45	-	ns
Reverse Recovery Charge(Note2)		Q_{rr}	-	57	-	nC

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

RATINGS AND CHARACTERISTIC CURVES

Figure 1. Typ. Output Characteristics

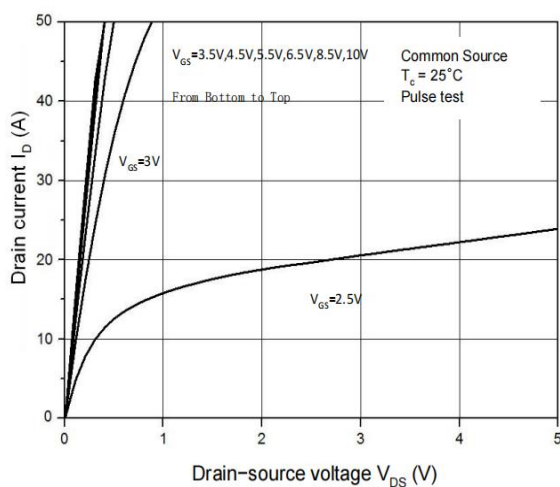


Figure 2. Transfer Characteristics

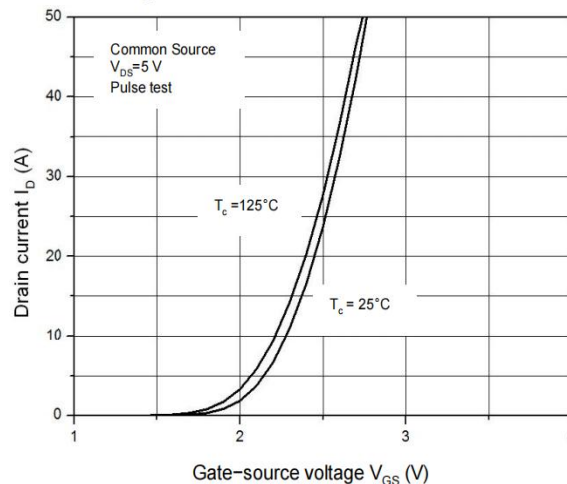


Figure 3. Capacitance Characteristics

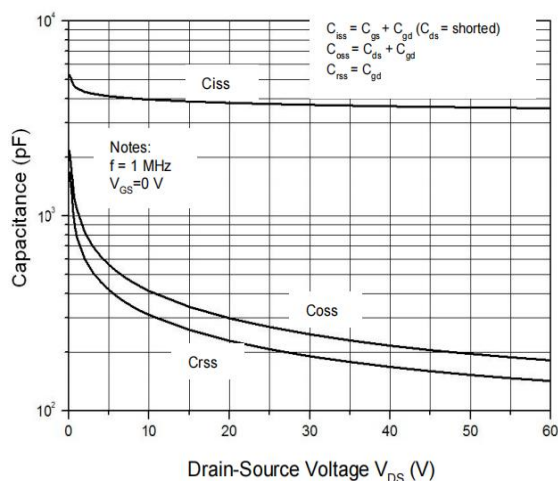


Figure 4. Gate Charge Waveform

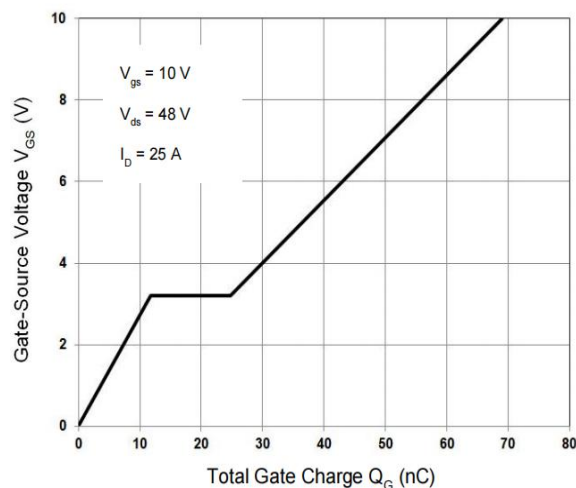


Figure 5. Body-Diode Characteristics

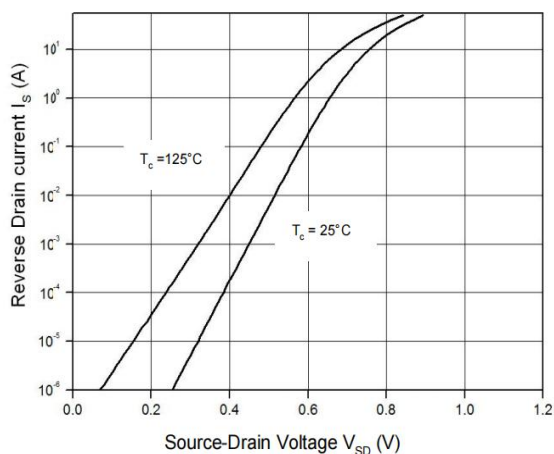
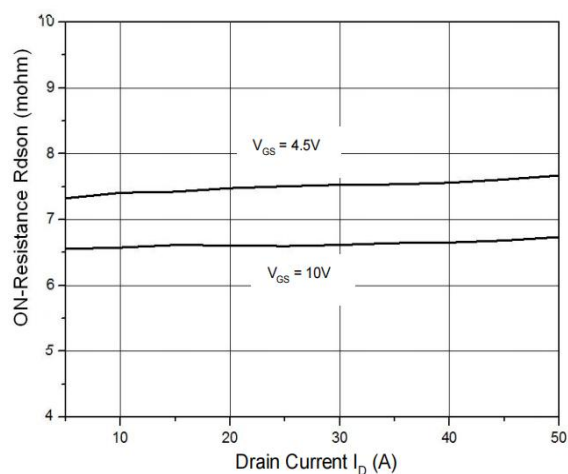


Figure 6. Rdson-Drain Current



RATINGS AND CHARACTERISTIC CURVES

Figure 7. $R_{DS(on)}$ -Junction Temperature($^{\circ}\text{C}$)

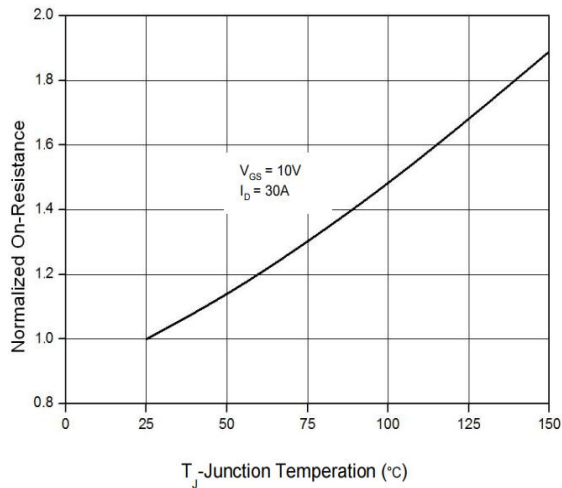


Figure 8. Maximum Safe Operating Area

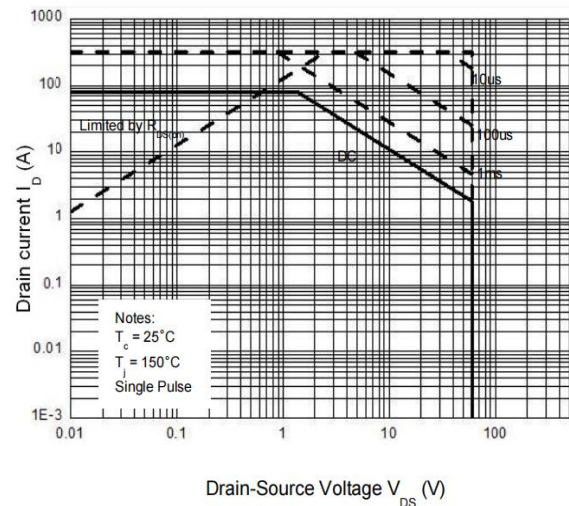
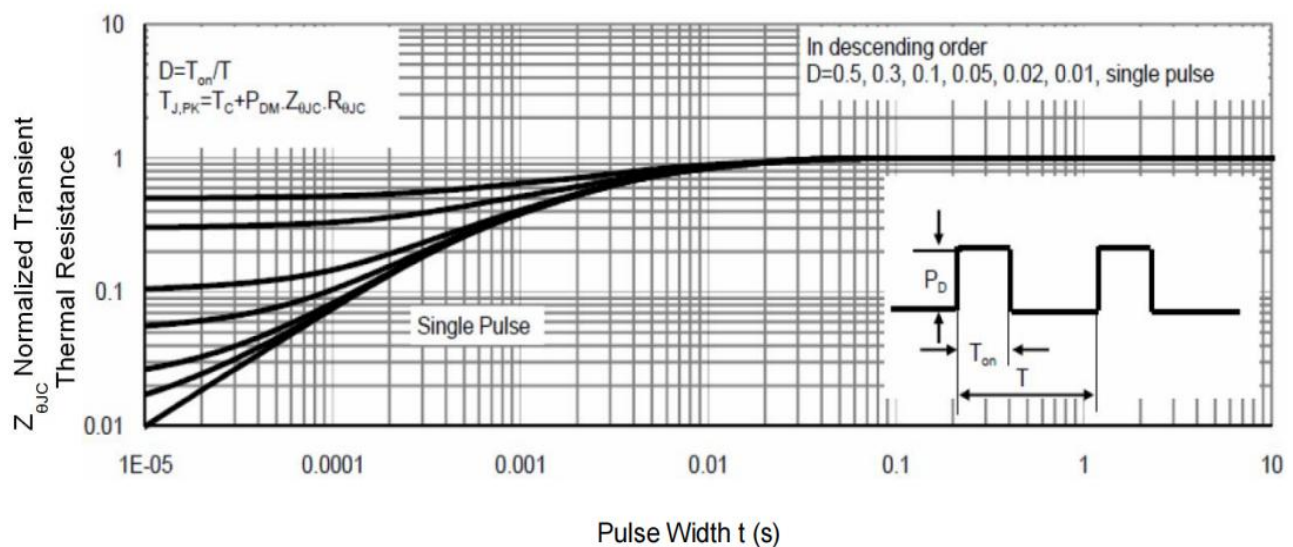
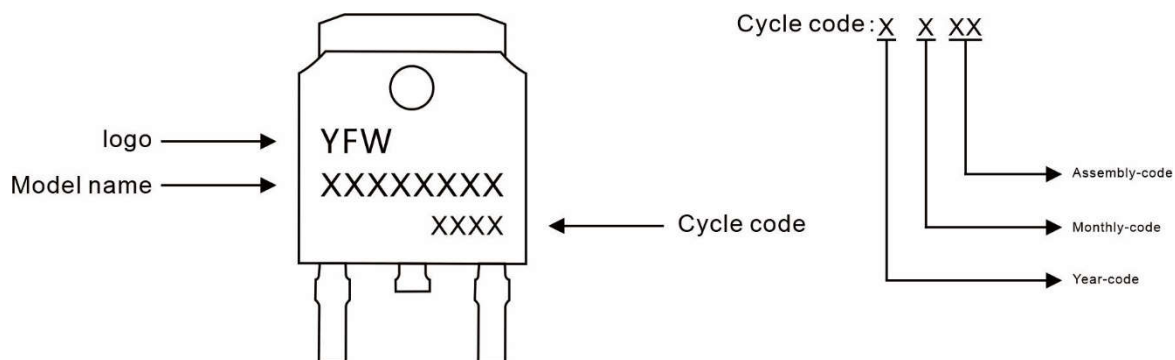


Figure 6. Normalized Maximum Transient Thermal Impedance (R_{thJC})



Marking Diagram



Ordering information

Model name	Package	Unit Weight	Base Quantity	Packing Quantity
YFWG80N06AD	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

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