

60V P-Channel Enhancement Mode MOSFET

MAIN CHARACTERISTICS

I_D	-50A
V_{DSS}	-60V
$R_{DS(on)-typ}(@V_{GS}=10V)$	<30mΩ (Type:25 mΩ)

FEATURES

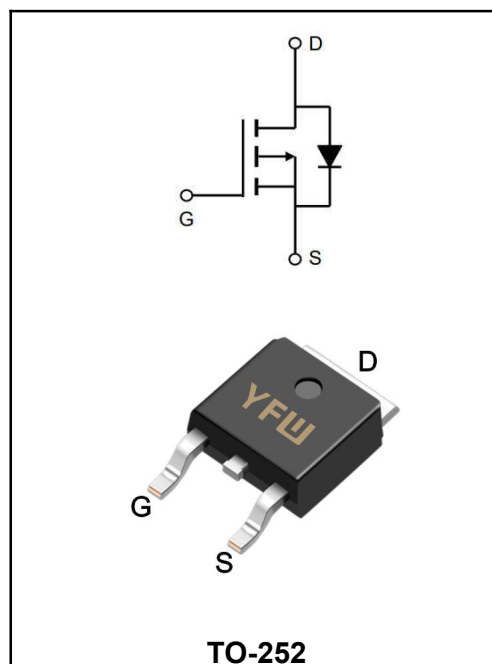
Adopt advanced trench technology to provide excellent $R_{DS(on)}$, low gate charge and operation with gate voltages as low as 4.5V. This device is suitable for use as a Battery protection or in other Switching application.

APPLICATIONS

- ◆ Battery protection
- ◆ Load switch
- ◆ Uninterruptible power supply

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 $T_c=25^{\circ}\text{C}$ 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	-50	A
Pulsed Drain Current (Note1)	I_{DM}	-200	A
Single Pulsed Avalanche Energy	E_{AS}	195	mJ
Power Dissipation	P_D	95	W
Operating Temperature Range	T_J	150	$^{\circ}\text{C}$
Storage Temperature Range	T_{STG}	-55 to +150	$^{\circ}\text{C}$
Thermal Resistance, Junction to Case	$R_{\theta JC}$	1.3	$^{\circ}\text{C/W}$
Thermal Resistance, Junction to Ambient	$R_{\theta JA}$	100	$^{\circ}\text{C/W}$

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

Electrical Characteristics at Tc=25°C unless otherwise specified

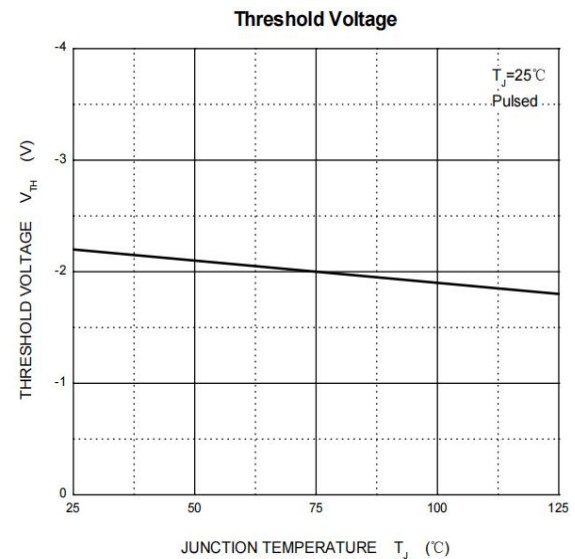
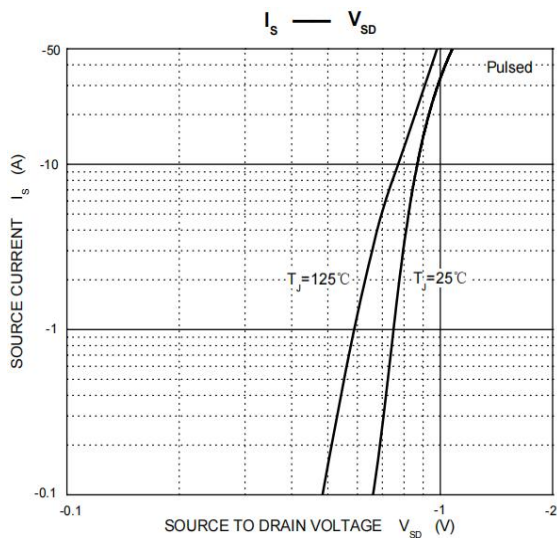
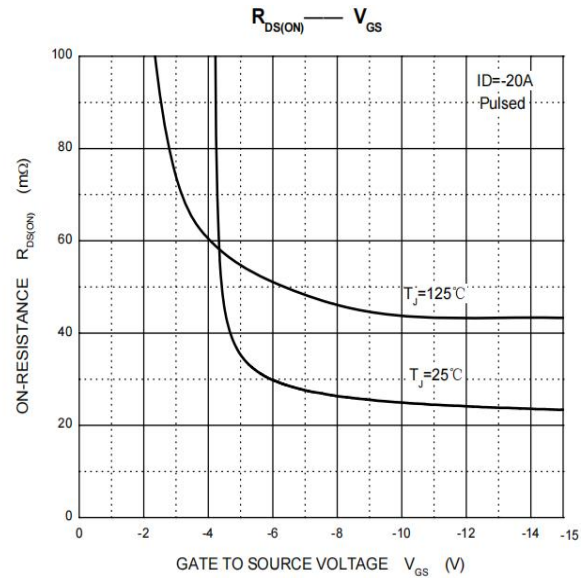
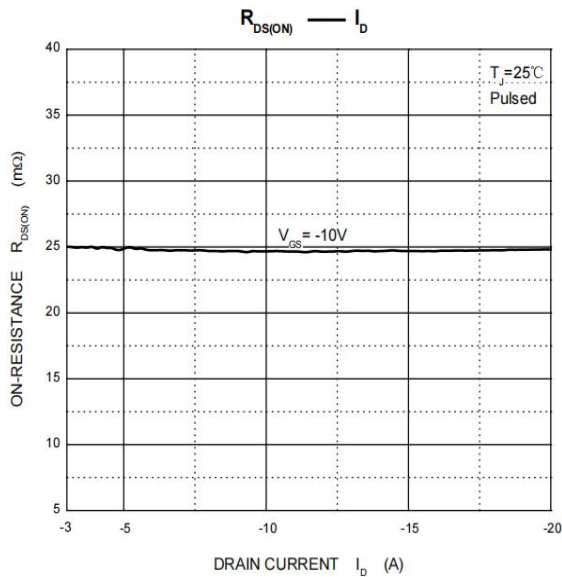
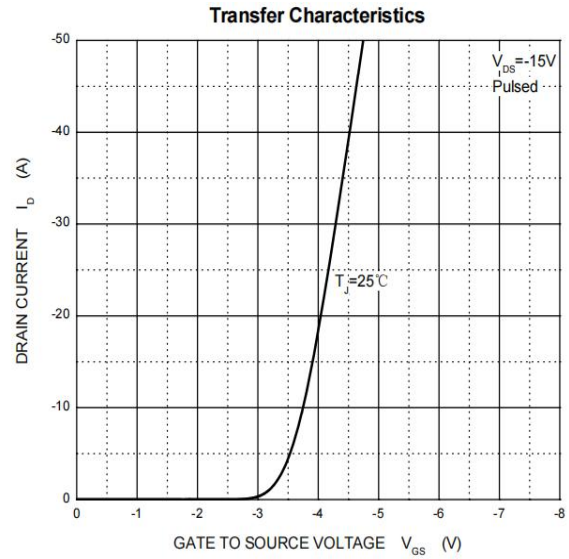
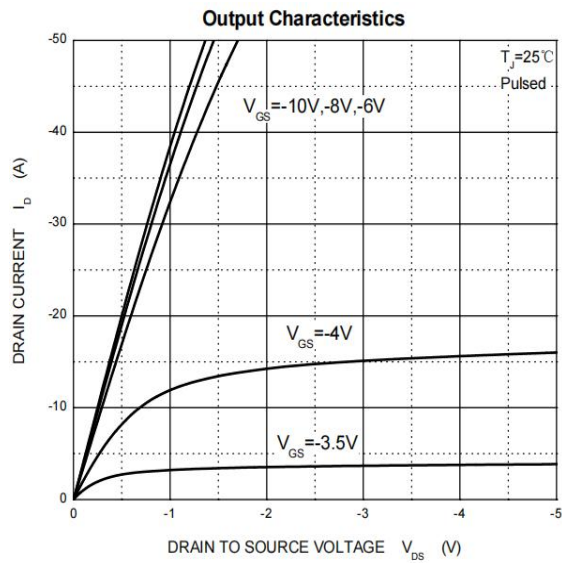
Characteristics	Test Condition	Symbol	Min	Typ	Max	Unit
Drain-Source Breakdown Voltage	$V_{GS} = 0\text{ V}, I_D = -250\text{ }\mu\text{A}$	BV_{DSS}	-60	-	-	V
Drain-Source Leakage Current	$V_{DS} = -60\text{ V}, V_{GS} = 0\text{ V}$	I_{DSS}	-	-	-1	μA
Gate Leakage Current	$V_{GS} = \pm 20\text{ V}, V_{DS} = 0\text{ V}$	I_{GSS}	-	-	± 100	nA
Gate-Source Threshold Voltage	$V_{DS} = V_{GS}, I_D = -250\text{ }\mu\text{A}$	$V_{GS(th)}$	-1	-	-2.5	V
Drain-Source On-State Resistance	$V_{GS} = -10\text{ V}, I_D = -20\text{ A}$	$R_{DS(on)}$	-	25	30	m Ω
Input Capacitance	$V_{DS} = -25\text{ V}, V_{GS} = 0\text{ V}, f = 1.0\text{ MHz}$	C_{iss}	-	4500	-	pF
Output Capacitance		C_{oss}	-	700	-	pF
Reverse Transfer Capacitance		C_{rss}	-	513	-	pF
Turn-on Delay Time(Note2)	$V_{DS} = -30\text{ V}, V_{GS} = -10\text{ V}, R_G = 3\text{ }\Omega, R_L = 1.5\text{ }\Omega$	$t_{d(ON)}$	-	15	-	ns
Rise Time(Note2)		t_r	-	17	-	ns
Turn-Off Delay Time(Note2)		$t_{d(OFF)}$	-	40	-	ns
Fall Time(Note2)		t_f	-	42	-	ns
Total Gate Charge(Note2)	$V_{DS} = -30\text{ V}, V_{GS} = -10\text{ V}, I_D = -20\text{ A}$	Q_G	-	73	-	nC
Gate to Source Charge(Note2)		Q_{GS}	-	15	-	nC
Gate to Drain Charge(Note2)		Q_{GD}	-	18	-	nC

Source-Drain Diode Characteristics at Ta=25°C unless otherwise specified

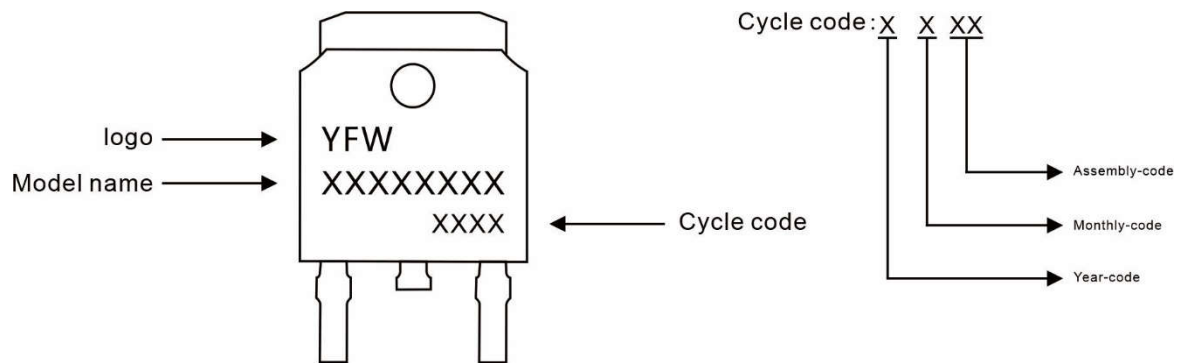
Characteristics	Test Condition	Symbol	Min.	Typ.	Max.	Unit
Maximun Body-Diode Continuous Current		I_S	-	-	-50	A
Maximun Body-Diode Pulsed Current(Note2)		I_{SM}	-	-	-200	A
Drain-Source Diode Forward Voltage	$V_{GS} = 0\text{ V}, I_S = -20\text{ A}, T_J = 25$	V_{SD}	-	-	-1.2	V

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

RATINGS AND CHARACTERISTIC CURVES



Marking Diagram



Ordering information

Model name	Package	Unit Weight	Base Quantity	Packing Quantity
YFW50P06AD	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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