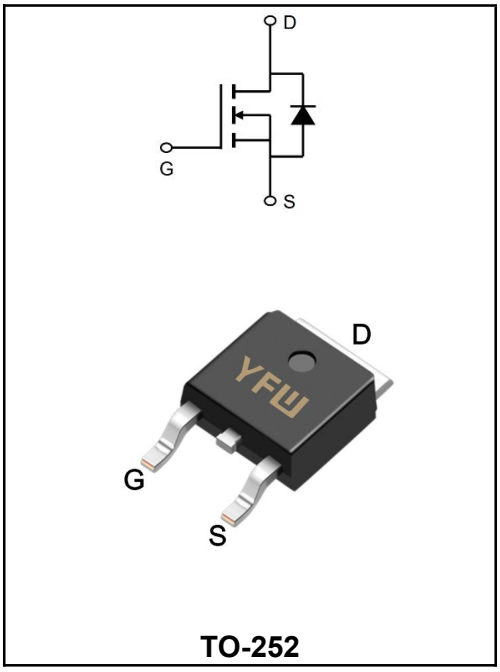
40V N-Channel Enhancement Mode MOSFET

MAIN CHARACTERISTICS

I_D	140A
V_{DSS}	40V
R_{DSON}-typ(@V_{GS}=10V)	＜2.7mΩ(Type:1.85 mΩ)



TO-252

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℃ maximum,10s per JESD 22-B106

Maximum Ratings at Tc=25°C unless otherwise specified

Characteristics	Symbols	Value	Units
Drain-Source Voltage	V_{DS}	40	V
Gate - Source Voltage	V_{GS}	±20	V
Continue Drain Current	I_D	140	A
Pulsed Drain Current (Note1)	I_{DM}	380	A
Single Pulse Avalanche Energy (Note1)	E_{AS}	500	mJ
Total Power Dissipation	P_D	96	W
Storage Temperature Range	T_{STG}	-55 to +150	°C
Operating Junction Temperature Range	T_J	150	°C
Thermal Resistance, Junction to Ambient	$R_{\theta JA}$	62	°C/W
Thermal Resistance, Junction to Case	$R_{\theta JC}$	1.3	°C/W

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

Maximum Ratings at Tc=25°C unless otherwise specified

Characteristics	Test Condition	Symbols	Min	Typ	Max	Units
Drain-Source Breakdown Voltage	V_{GS}=0V, I_D=250μA	BV_{DSS}	40	-	-	V
Gate Body Leakage Current	V_{GS}=±20V, V_{DS}=0V	I_{GSS}	-	-	±100	nA
Drain-Source Leakage Current	V_{DS} = 40 V, V_{GS} = 0 V	I_{DSS}	-	-	1	μA
Gate Threshold Voltage	V_{DS}= V_{GS}, I_D=250μA	$V_{GS(th)}$	1	-	2.2	V
Drain-Source on-Resistance (Note 2)	V_{GS}=10V, I_D=20A	$R_{DS(ON)}$	-	1.85	2.7	mΩ
	V_{GS}=4.5V, I_D=15A		-	2.5	3.5	mΩ
Input Capacitance	V_{DS}=25V V_{GS}=0V f=1MHz	C_{iss}	-	7800	-	pF
Output Capacitance		C_{oss}	-	1256	-	
Reverse Transfer Capacitance		C_{rss}	-	780	-	
Total Gate Charge (Note 2)	V_{GS}=4.5V V_{DS}=20V I_D=70A	Q_g	-	170	-	nC
Gate-Source Charge (Note 2)		Q_{gs}	-	52	-	
Gate-Drain Charge (Note 2)		Q_{gd}	-	70	-	
Turn-on delay time (Note 2)	V_{DD}=20 V V_{GS}=10 V , RG=3.7 Ω ID=70A	$t_{d(on)}$	-	25	-	ns
Rise Time (Note 2)		T_r	-	80	-	
Turn-Off Delay Time (Note 2)		$t_{d(OFF)}$	-	85	-	
Fall Time (Note 2)		t_f	-	42	-	
Body Diode Reverse Recovery Time(Note2)	T_J = 25℃, I_F= 40A di / dt = 100 A/μs	t_{rr}	-	31	-	ns
Body Diode Reverse Recovery Charge(Note2)		Q_{rr}	-	27	-	nC
Drain-Source Diode Forward Voltage	V_{GS}=0V , I_S=20A , T_J=25℃	V_{SD}	-	-	1.2	V
Maximun Body-Diode Continuous Current		I_S	-	-	140	A

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

Ratings and Characteristic Curves

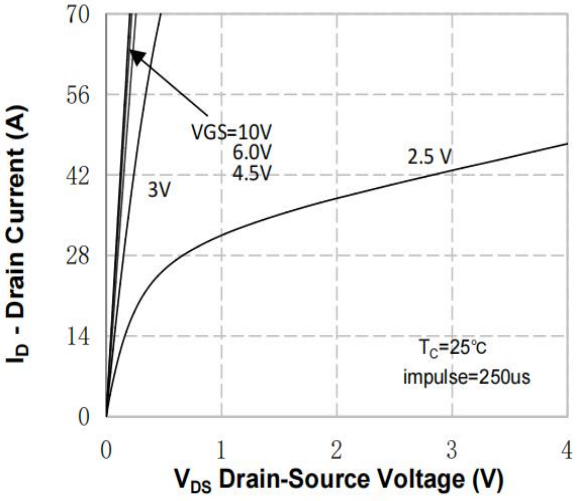


Figure 1. On-Region Characteristics

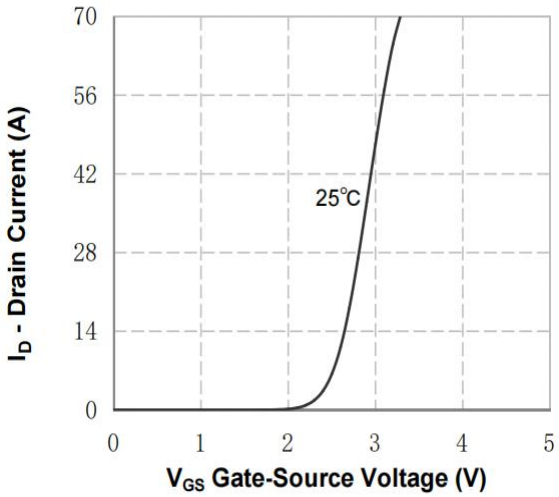


Figure 2. Transfer Characteristics

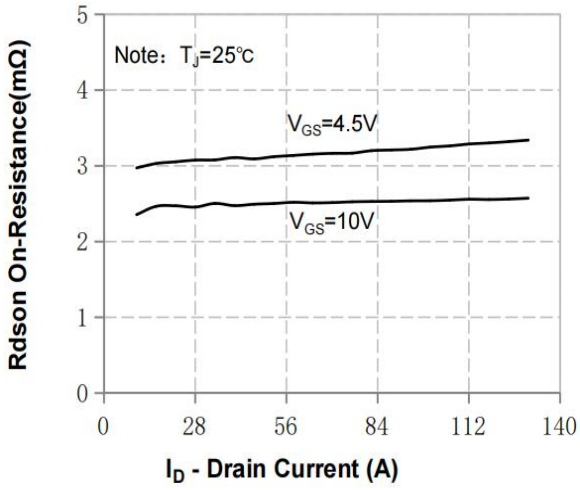


Figure 3. On-Resistance Variation vs Drain Current and Gate Voltage

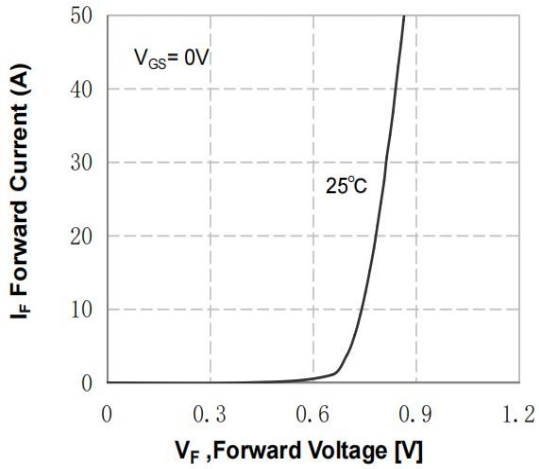


Figure 4. Body Diode Forward Voltage Variation with Source Current and Temperature

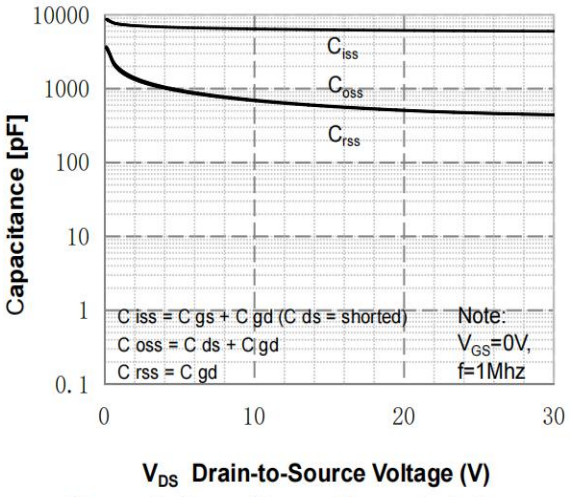


Figure 5. Capacitance Characteristics

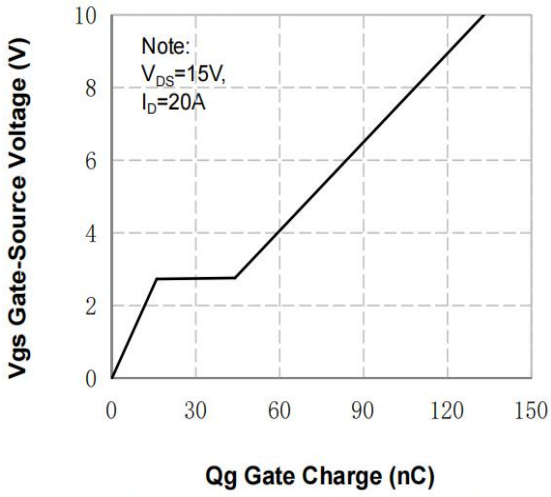


Figure 6. Gate Charge Characteristics

Ratings and Characteristic Curves

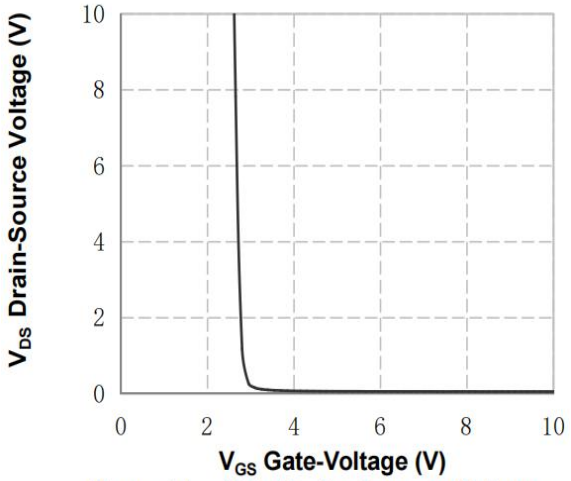


Figure 7. Vds Drain-Source Voltage vs Gate Voltage

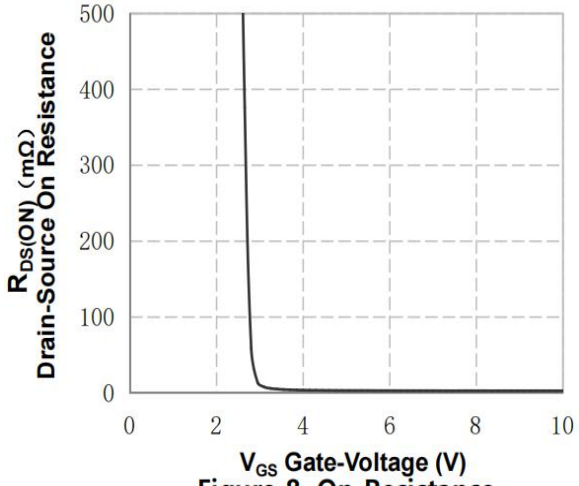


Figure 8. On-Resistance vs Gate Voltage

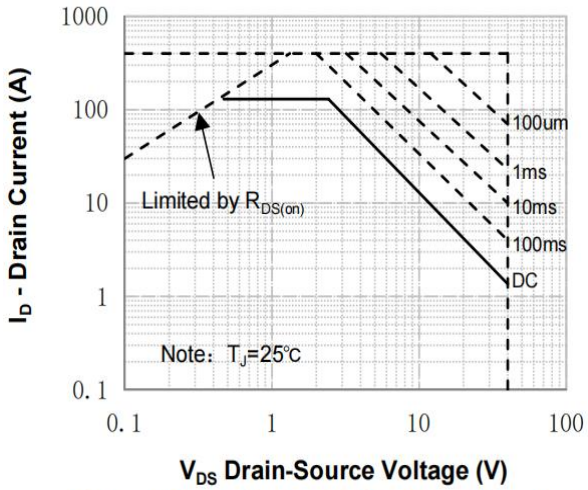


Figure 9. Maximum Safe Operating Area

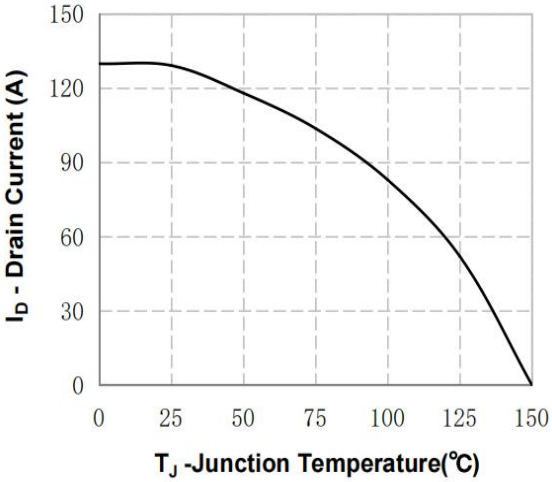


Figure 10. Maximum Continuous Drain Current vs Case Temperature

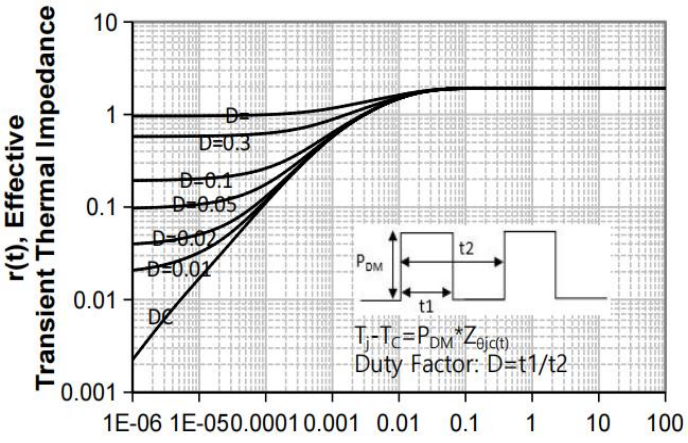
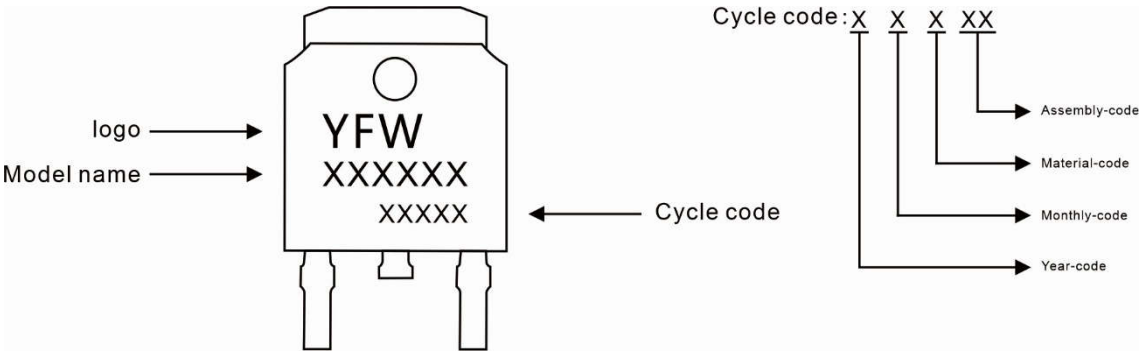


Figure 11. Transient Thermal Response Curve

Marking Diagram

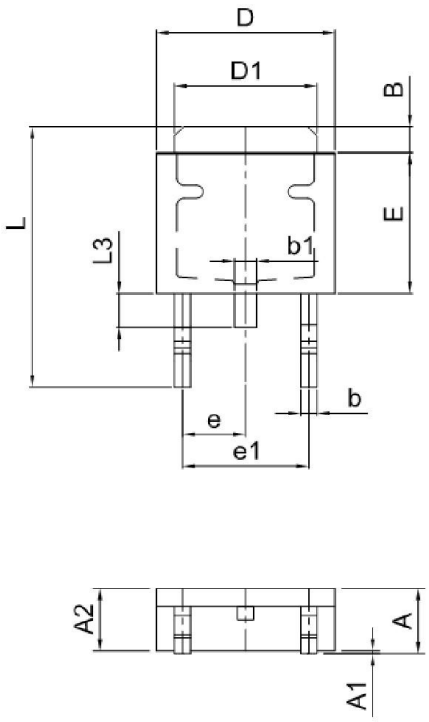


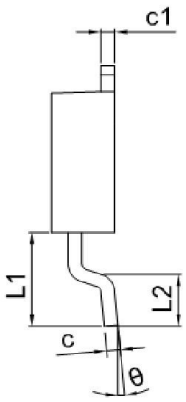
Ordering information

Model name	Package	Unit Weight	Base Quantity	Packing Quantity
YFW140N04AD	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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