

40V N-Channel Enhancement Mode MOSFET

MAIN CHARACTERISTICS

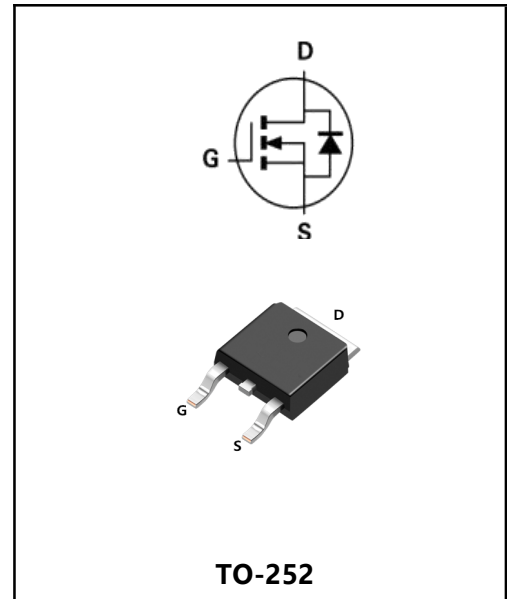
I_D	140A
V_{DSS}	40V
R_{DS(on)-typ}(@V_{GS}=10V)	<2.7mΩ(Type:1.85 mΩ)

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



Product Specification Classification

Part Number	Package	Marking	Pack
YFW140N04AD	TO-252	YFW 140N04AD XXXXX	2500 pcs /reel/5000pcs/box

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 _{θJA}	62	°C/W
Thermal Resistance, Junction to Case	R _{θJC}	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	$V_{GS}=0V, I_D=250\mu A$	BV_{DSS}	40	-	-	V
Gate Body Leakage Current	$V_{GS}=\pm 20V, V_{DS}=0V$	I_{GSS}	-	-	± 100	nA
Drain-Source Leakage Current	$V_{DS} = 40V, V_{GS} = 0V$	I_{DSS}	-	-	1	μA
Gate Threshold Voltage	$V_{DS}=V_{GS}, I_D=250\mu A$	$V_{GS(th)}$	1	-	2.2	V
Drain-Source on-Resistance (Note 2)	$V_{GS}=10V, I_D=20A$	$R_{DS(ON)}$	-	1.85	2.7	m Ω
	$V_{GS}=4.5V, I_D=15A$		-	2.5	3.5	m Ω
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)	$V_{DD}=20V$ $V_{GS}=10V$, $RG=3.7\Omega$ $ID=70A$	$t_{d(on)}$	-	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)	$T_J = 25^\circ C, I_F = 40A$ $di / dt = 100 A/\mu s$	t_{rr}	-	31	-	ns
Body Diode Reverse Recovery Charge(Note2)		Q_{rr}	-	27	-	nC
Drain-Source Diode Forward Voltage	$V_{GS}=0V, I_S=20A, T_J=25^\circ C$	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

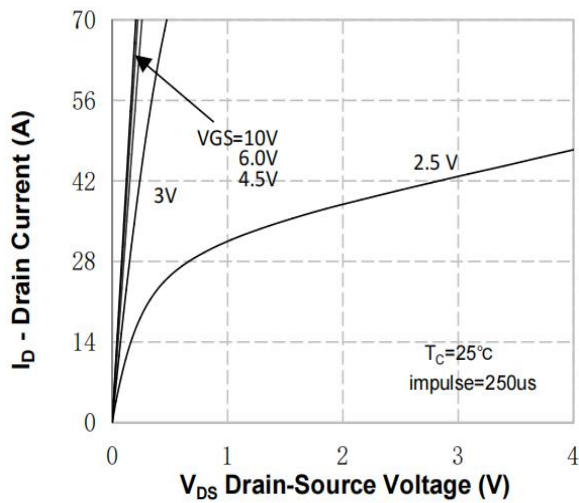


Figure 1. On-Region Characteristics

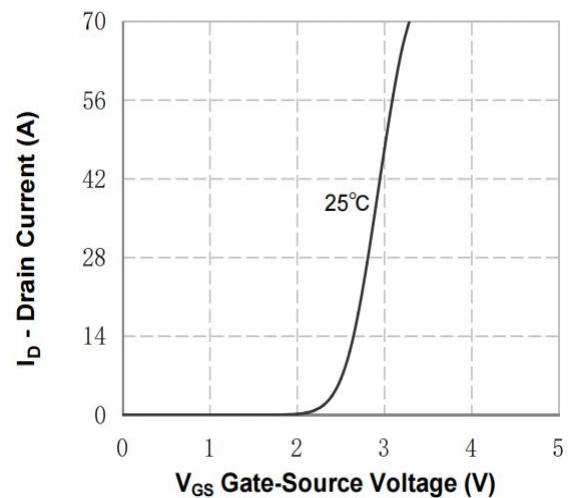


Figure 2. Transfer Characteristics

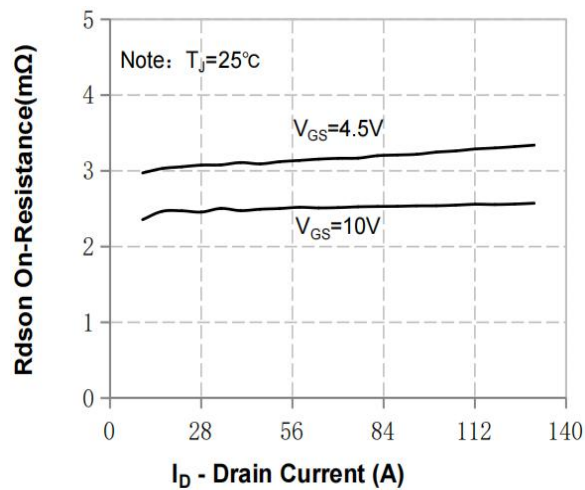


Figure 3. On-Resistance Variation vs Drain Current and Gate Voltage

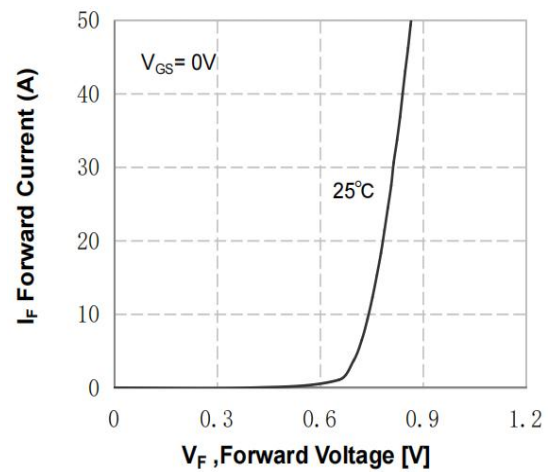


Figure 4. Body Diode Forward Voltage Variation with Source Current and Temperature

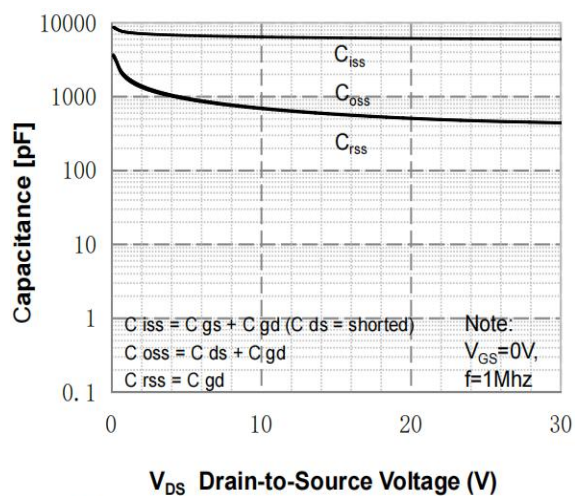


Figure 5. Capacitance Characteristics

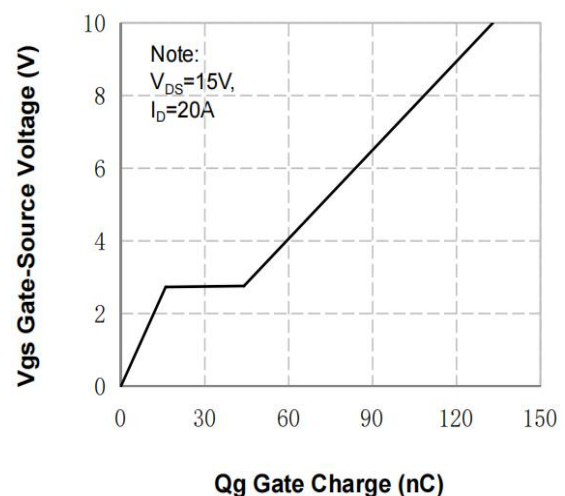


Figure 6. Gate Charge Characteristics

Ratings and Characteristic Curves

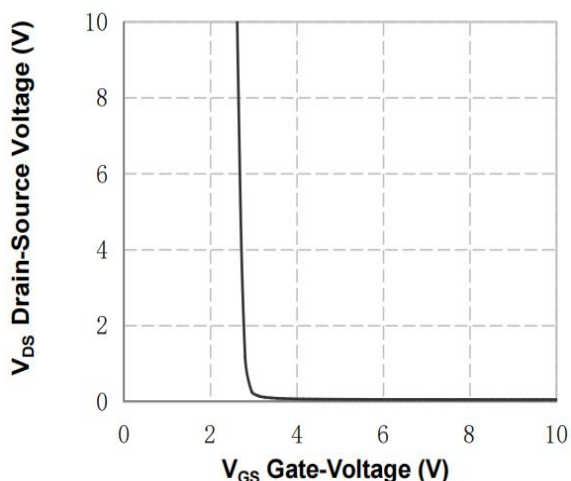


Figure 7. Vds Drain-Source Voltage vs Gate Voltage

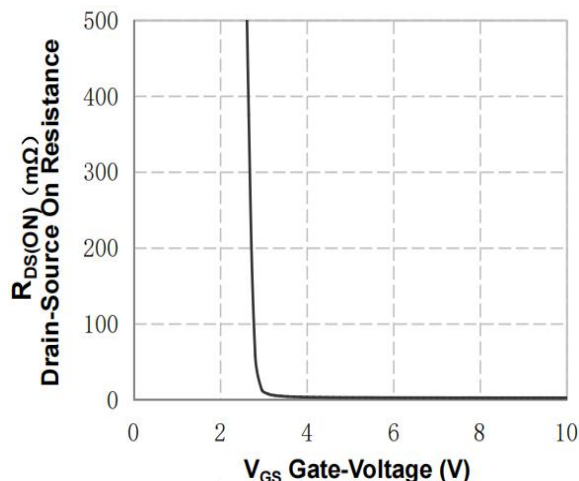


Figure 8. On-Resistance vs Gate Voltage

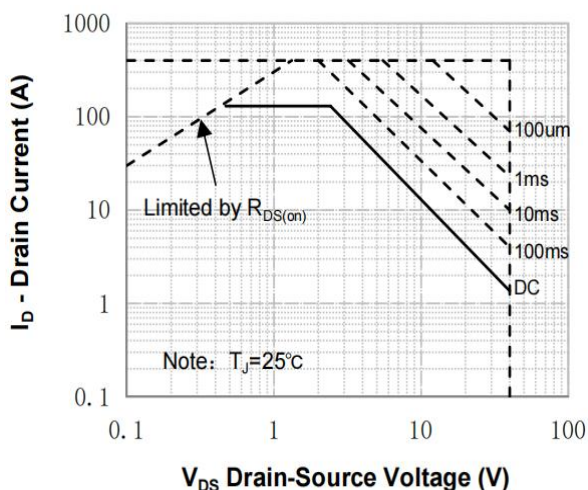


Figure 9. Maximum Safe Operating Area

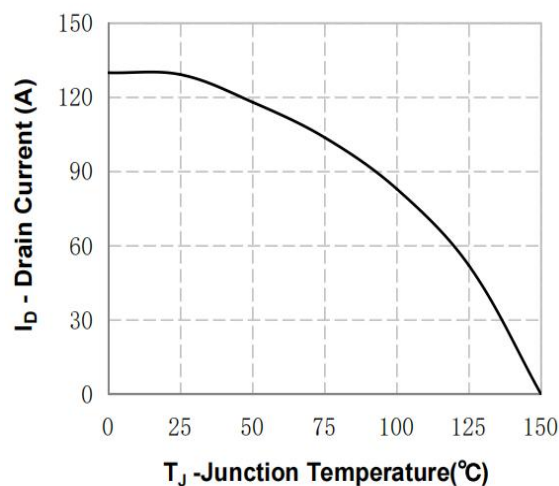


Figure 10. Maximum Continuous Drain Current vs Case Temperature

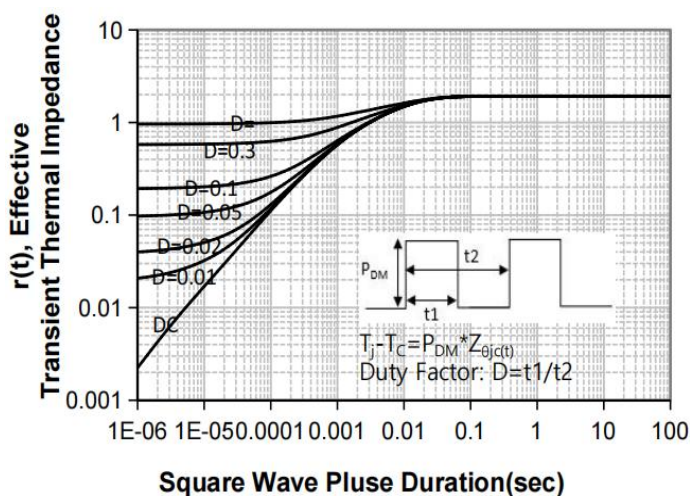
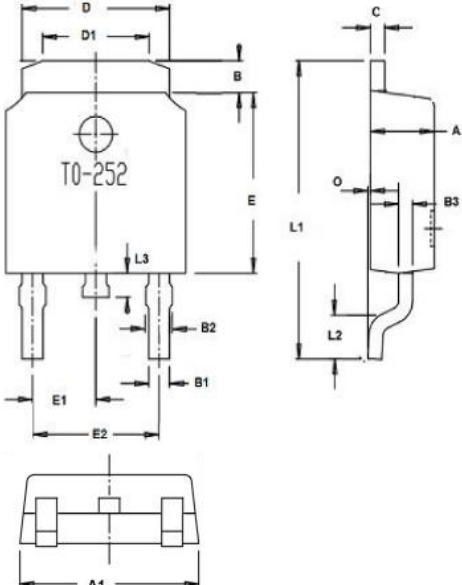


Figure 11. Transient Thermal Response Curve

Package Outline Dimensions Millimeters

TO-252

	Dim.	Min.	Max.
	A	2.1	2.5
	A1	6.3	6.9
	B	0.95	1.55
	B1	0.6	0.8
	B2	0.75	0.95
	C	Typ0.5	
	D	5.3	5.5
	D1	3.65	4.05
	E	5.8	6.4
	E1	Typ2.3	
	E2	Typ4.6	
	O	0	0.15
	L1	10	11
	L2	Typ1.5	
	L3	0.7	1
All Dimensions in millimeter			