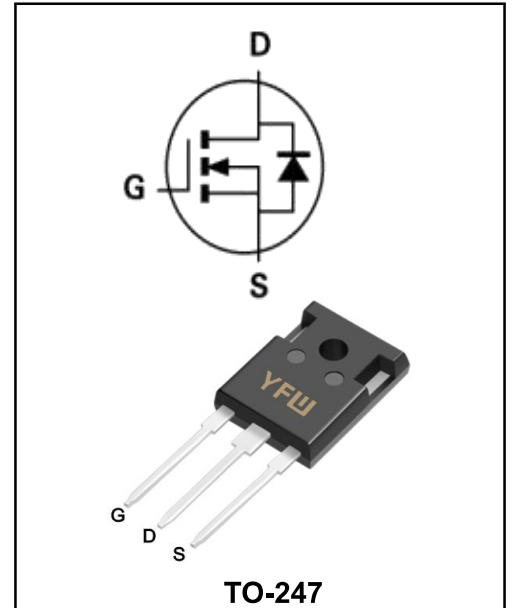


650V N-Channel Super Junction MOSFET with Fast Diode

MAIN CHARACTERISTICS

I_D	43A
V_{DS}	650V
$R_{DS(on)-typ}(@V_{GS}=10V)$	$<80m\Omega$ (Typ: 72mΩ)



FEATURES

- ♦Fast Switching
- ♦Low ON Resistance
- ♦Low Gate Charge
- ♦100% Single Pulse avalanche energy Test

APPLICATIONS

- ♦Switch Mode Power Supply(SMPS)
- ♦Uninterruptible Power Supply(UPS)
- ♦Power Factor Correction(PFC)

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}	650	V
Gate-Source Voltage	V_{GS}	± 30	V
Continue Drain Current	I_D	43	A
Pulsed Drain Current (Note1)	I_{DM}	172	A
Power Dissipation	P_D	335	W
Single Pulse Avalanche Energy (Note1)	E_{AS}	130	mJ
Operating Temperature Range	T_J	-50 to +150	$^\circ\text{C}$
Storage Temperature Range	T_{STG}	-50 to +150	$^\circ\text{C}$
Thermal Resistance, Junction to Case	$R_{\theta JC}$	0.36	$^\circ\text{C/W}$
Thermal Resistance, Junction to Ambient	$R_{\theta JA}$	62	$^\circ\text{C/W}$

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

Maximum Ratings at Tc=25°C unless otherwise specified

Characteristics	Test Condition	Symbo	Min	Typ	Max	Unit
Drain-Source Breakdown Voltage	$V_{GS} = 0\text{ V}, I_D = 250\text{ }\mu\text{A}$	BV_{DSS}	650	-	-	V
Drain-Source Leakage Current	$V_{DS} = 650\text{ V}, V_{GS} = 0\text{ V}$	I_{DSS}	-	-	5	μA
Gate Leakage Current	$V_{GS} = \pm 30\text{ V}, V_{DS} = 0\text{ V}$	I_{GSS}	-	-	± 100	nA
Gate-Source Threshold Voltage	$V_{DS} = V_{GS}, I_D = 250\text{ }\mu\text{A}$	$V_{GS(th)}$	3	-	4.5	V
Drain-Source On-State Resistance	$V_{GS} = 10\text{ V}, I_D = 21.5\text{ A}$	$R_{DS(ON)}$	-	72	80	m Ω
Input Capacitance	$V_{DS} = 200\text{ V}$ $V_{GS} = 0\text{ V}$ $f = 1.0\text{ MHz}$	C_{iss}	-	4100	-	pF
Output Capacitance		C_{oss}	-	106	-	pF
Reverse Transfer Capacitance		C_{rss}	-	6.1	-	pF
Turn-on Delay Time(Note2)	$V_{GS} = 10\text{ V}, R_G = 24\Omega,$ $V_{DS} = 325\text{ V}, I_D = 43\text{ A}$	$t_{d(on)}$	-	77	-	ns
Rise Time(Note2)		T_r	-	116	-	ns
Turn-Off Delay Time(Note2)		$t_{d(OFF)}$	-	193	-	ns
Fall Time(Note2)		t_f	-	78	-	ns
Total Gate Charge(Note2)	$V_{GS} = 10\text{ V}, V_{DS} = 520\text{ V},$ $I_D = 43\text{ A}$	Q_G	-	95	-	nC
Gate to Source Charge(Note2)		Q_{GS}	-	35	-	nC
Gate to Drain Charge(Note2)		Q_{GD}	-	42	-	nC
Maximum Continuous Drain -Source Diode Forward Current		I_S	-	-	43	A
Maximum Pulsed Drain-Source Diode Forward Current(Note2)		I_{SM}	-	-	172	A
Drain-Source Diode Forward Voltage	$V_{GS} = 0\text{ V}, I_S = 43\text{ A}, T_J = 25^\circ\text{C}$	V_{SD}	-	-	1.2	V
Reverse recovery time	$I_S = I_F, I_{SD} = 43\text{ A}, V_{ds} = 400\text{ V},$	t_{rr}	-	150	-	ns
Reverse recovery charge	$dI / dt = 100\text{ A}/\mu\text{s}$	Q_{rr}		1055		uC

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

Figure 1. Output characteristics

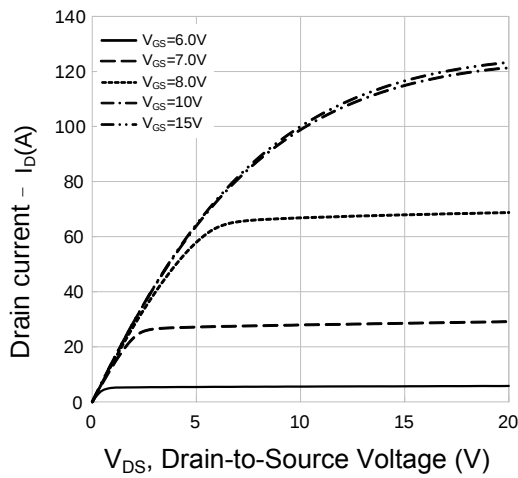


Figure 2. Output Characteristics

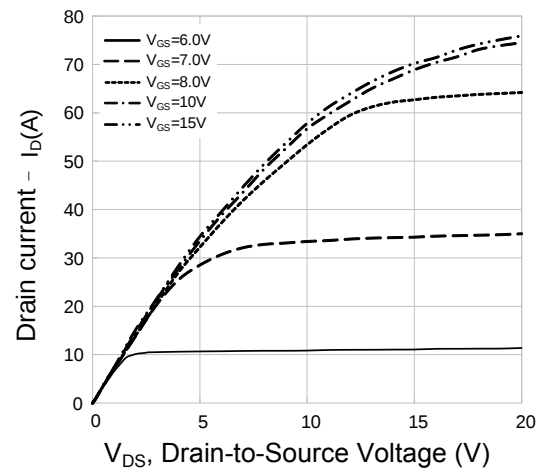


Figure 3. Transmission characteristics

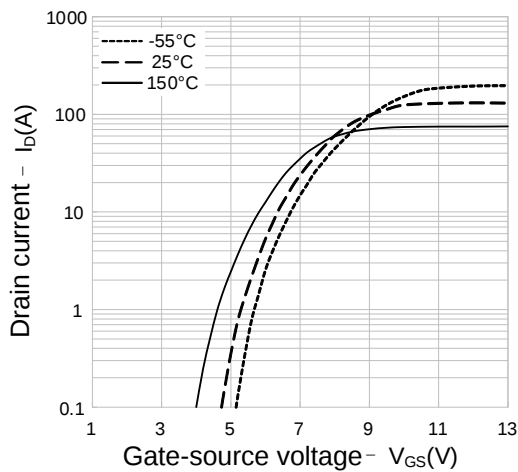


Figure 4. On-resistance vs. drain current

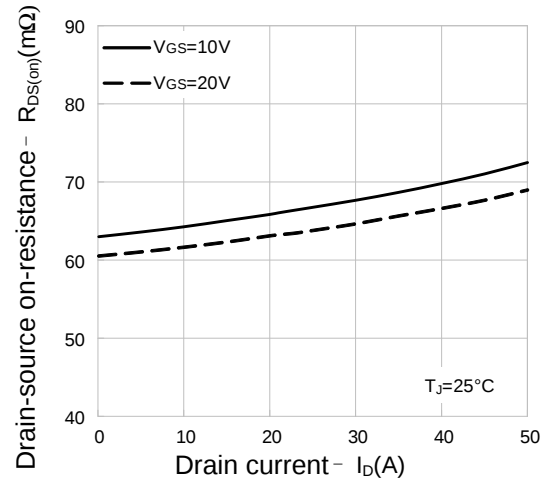


Figure 5. On-resistance vs. drain current

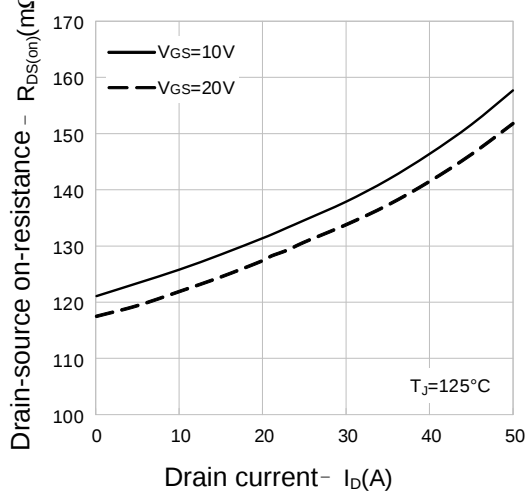
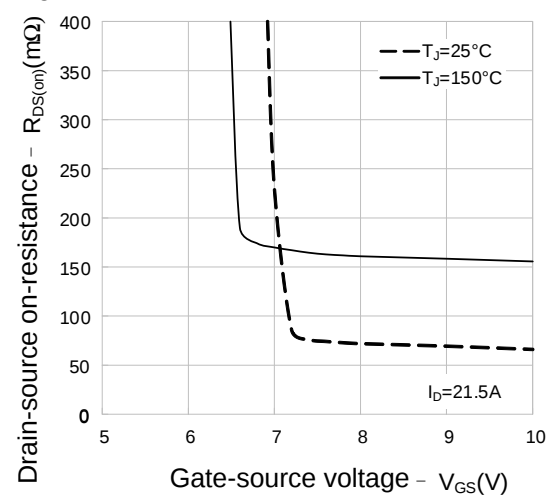


Figure 6. On-resistance VS. Gate-source voltage



Ratings and characteristic curves

Figure 7. Turn-on voltage vs. temperature characteristics

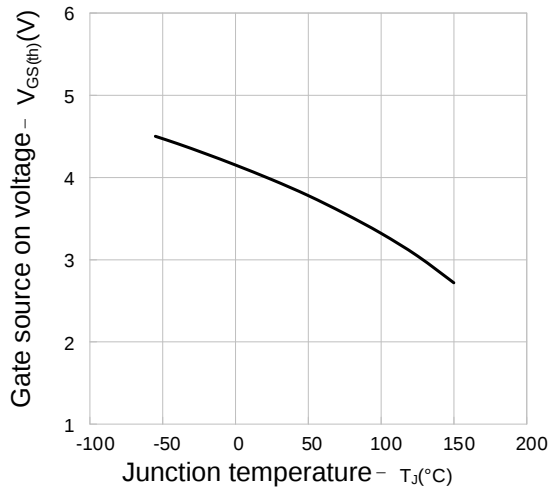


Figure 8. Forward voltage drop of the body diode vs. source current and temperature

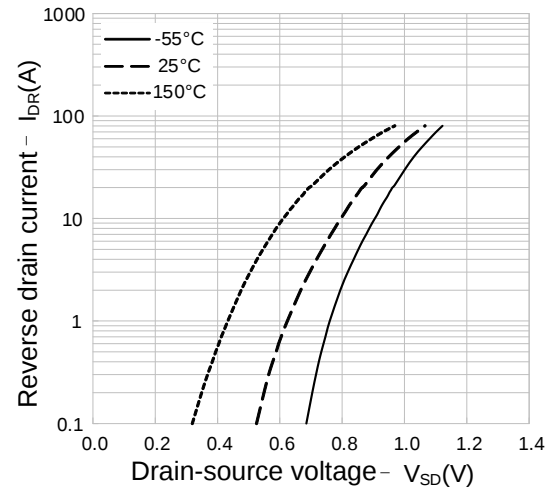


Figure 9: Capacitance characteristics

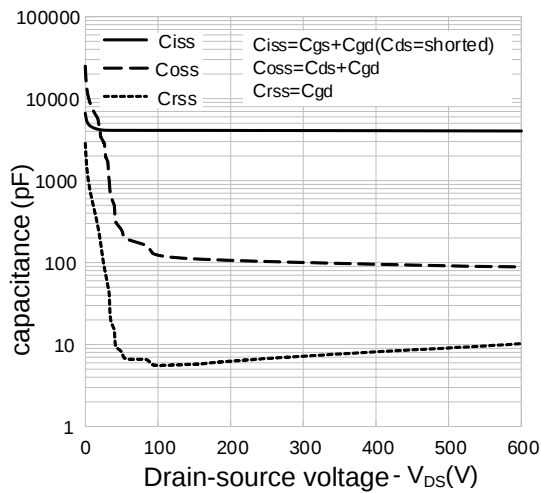


Figure 10. Charge quantity characteristics

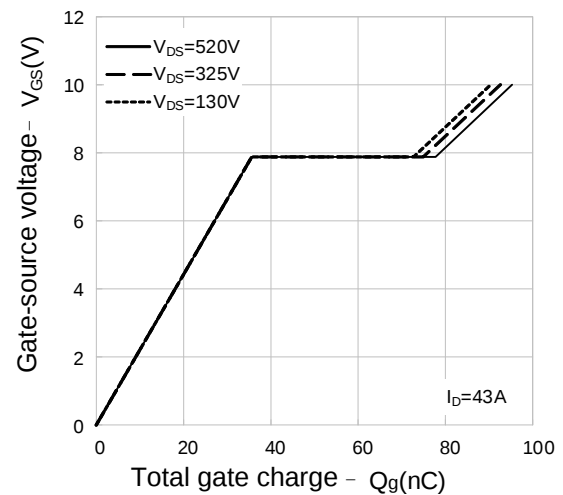
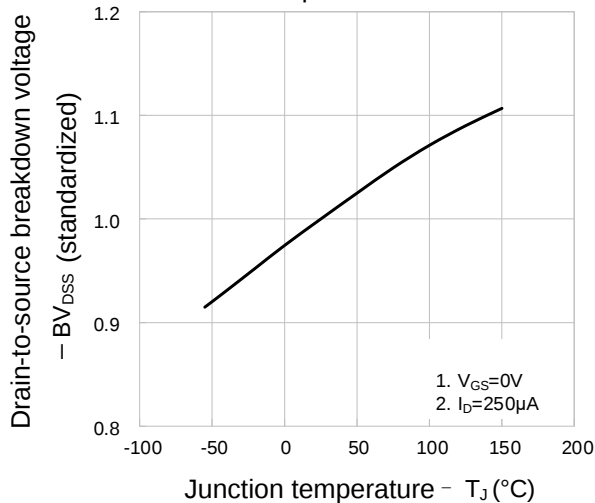
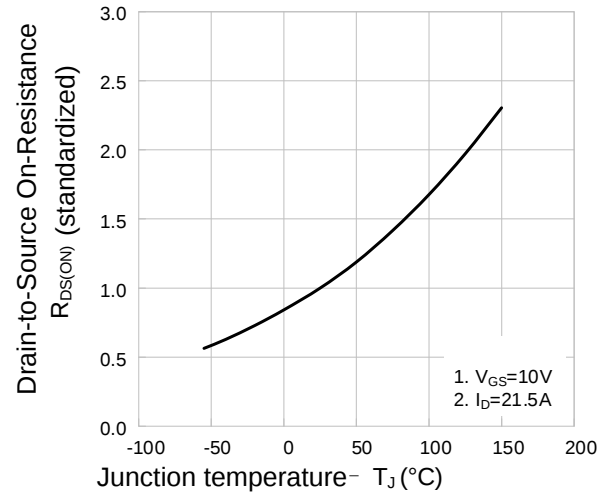


Figure 11. Breakdown voltage vs. temperature characteristics



12. On-resistance vs. temperature characteristics



Ratings And Characteristic Curves

Figure 13. Maximum safe working area

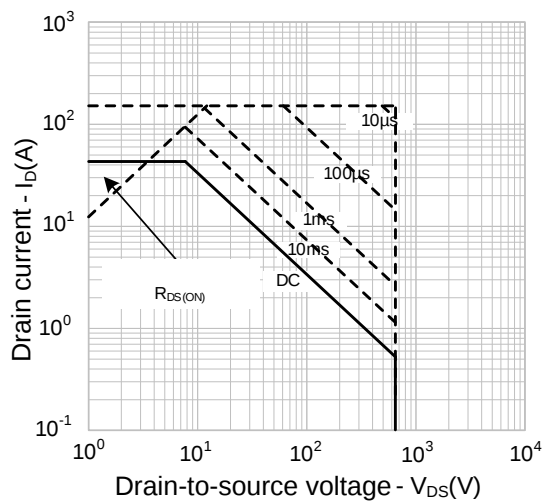


Figure 14. Dissipated power vs. temperature

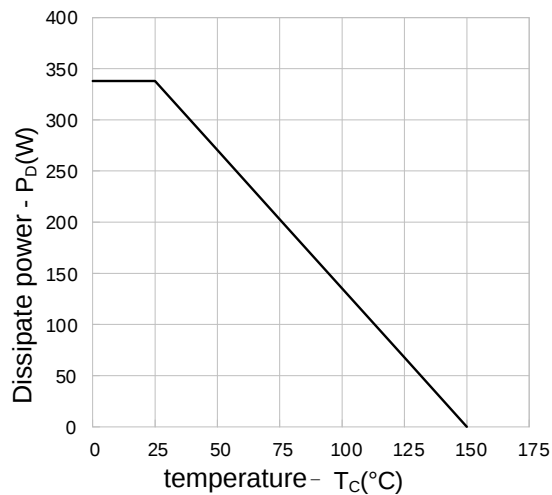


Figure 15. Drain current vs. case temperature

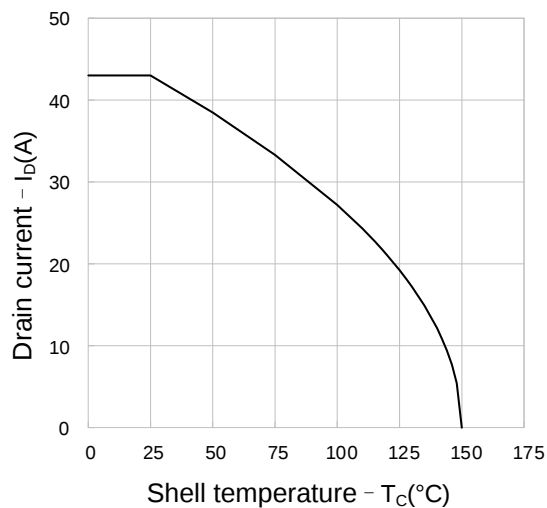
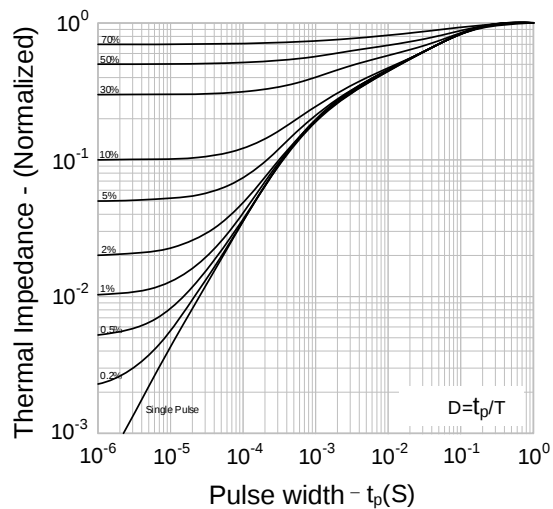
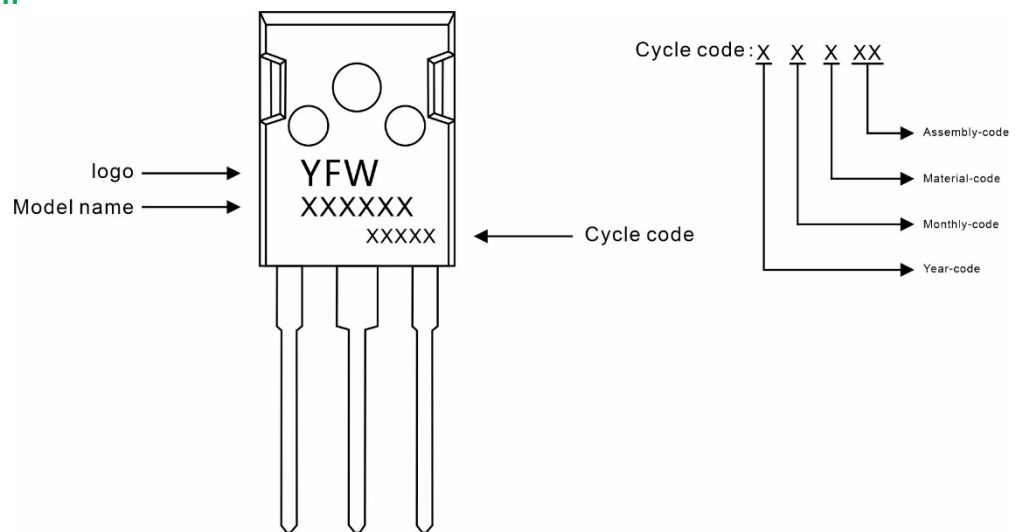


Figure 16. Transient thermal impedance vs. pulse width



Marking Diagram



Ordering information

Model name	Package	Unit Weight	Base Quantity	Packing Quantity
YFWF65R075AP	TO-247	0.209oz(5.93g)	30pcs/tube	600PCS/Box 2400PCS/Carton

Package Dimensions

TO-247

Symbol	Dimensions in mm		Dimensions in Inch	
	Min.	Max.	Min.	Max.
A	4.90	5.10	0.193	0.201
A1	1.90	2.10	0.075	0.083
A2	2.29	2.54	0.090	0.100
b	1.00	1.40	0.039	0.055
b1	2.00	2.20	0.079	0.087
b2	3.00	3.20	0.118	0.126
c	0.50	0.70	0.020	0.028
D	15.75	16.05	0.620	0.632
E	20.20	20.80	0.795	0.819
e	5.45 (BSC)		0.215 (BSC)	
e1	10.90 (BSC)		0.429 (BSC)	
F	6.05	6.25	0.238	0.246
F1	5.80	6.00	0.228	0.236
L	20.10	20.40	0.791	0.803
L1	4.05	4.35	0.159	0.171
Φ	3.50	3.70	0.138	0.146

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