

600V N-channel Super Junction MOSFET

MAIN CHARACTERISTICS

I_D	30A
V_{DS}	600V
$R_{DS(on)-typ}(@V_{GS}=10V)$	$< 130m\Omega$ (Typ:120mΩ)

FEATURES

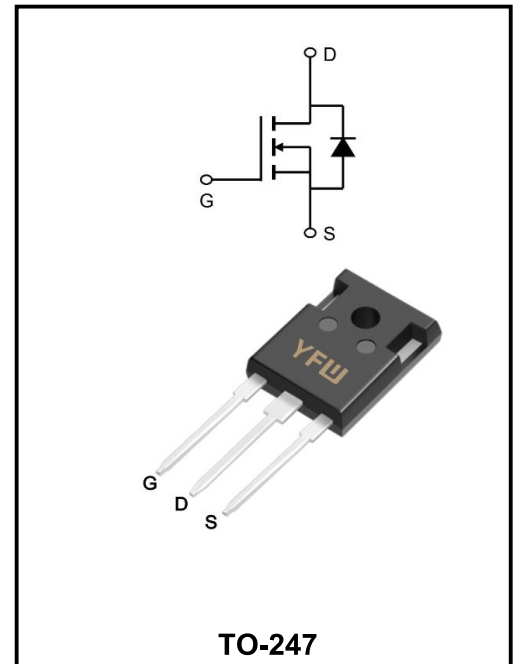
- ◆ Low gate charge
- ◆ Low RDS(on) per chip area (Low FOM)
- ◆ Very low switching and conduction loss
- ◆ Extremely high commutation ruggedness

APPLICATIONS

- ◆ Solar inverters
- ◆ LCD/LED/PDP TV
- ◆ Telecom/Server Power supplies
- ◆ AC-DC Power Supply

MECHANICAL DATA

- ◆ Case: TO-247/AP
- ◆ 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	Symbols	Value	Units
Drain-Source Voltage	V_{DS}	600	V
Gate - Source Voltage	V_{GS}	± 30	V
Continue Drain Current	I_D	30	A
Pulsed Drain Current (Note1)	I_{DM}	90	A
Power Dissipation	P_D	34	W
Single Pulse Avalanche Energy(Note1)	E_{AS}	330	mJ
Operating Temperature Range	T_J	-55 to +150	°C
Storage Temperature Range	T_{STG}	-55 to +150	°C
Thermal Resistance, Junction-case	$R_{\theta JC}$	3.7	°C/W
Thermal Resistance, Junction-ambient	$R_{\theta JA}$	80	°C/W

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

Electrical Characteristics 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}	600	-	-	V
Drain-Source Leakage Current	$V_{DS}=600V, V_{GS}=0V$	I_{DSS}	-	-	1	μA
Gate Leakage Current	$V_{GS}=\pm 30V, V_{DS}=0V$	I_{GSS}			± 100	nA
Gate-Source Threshold Voltage	$V_{DS}=V_{GS}, I_D=250\mu A$	$V_{GS(th)}$	2	-	4	V
Drain-source on-state resistance	$V_{GS}=10V, I_D=15A$	$R_{DS(on)}$	-	120	130	m Ω
Input Capacitance	$V_{DS}=50V$ $V_{GS}=0V$ $f=1.0MHz$	C_{iss}	-	1950	-	pF
Output Capacitance		C_{oss}	-	245	-	
Reverse Transfer Capacitance		C_{rss}	-	29	-	
Turn-on Delay Time(Note2)	$V_{DS}=300V$ $I_D=30A$ $R_G=25\Omega$	$t_{d(on)}$	-	30	-	ns
Rise Time(Note2)		T_r	-	45	-	
Turn-Off Delay Time(Note2)		$t_{d(OFF)}$	-	145	-	
Fall Time(Note2)		t_f	-	36	-	
Total Gate Charge(Note2)	$V_{DS}=480V,$ $V_{GS}=10V,$ $I_D=30A$	Q_g	-	50	-	nC
Gate to Source Charge(Note2)		Q_{gs}	-	10	-	
Gate to Source Charge(Note2)		Q_{gd}	-	14	-	
Maximun Body-Diode Continuous Current		I_S	-	-	30	A
Maximun Body-Diode Pulsed Current(Note2)		I_{SM}	-	-	90	A
Drain-Source Diode Forward Voltage	$V_{GS}=0V, I_S=30A, T_J=25^\circ C$	V_{SD}	-	-	1.4	V
Reverse Recovery Time	$V_R=100V$ $I_S=30A, di/dt=100A/\mu s$	trr	-	370	-	nS
Reverse Recovery Charge		Q_{rr}	-	6.4	-	μC

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

Ratings and Characteristic Curves

Figure1. Output Characteristics

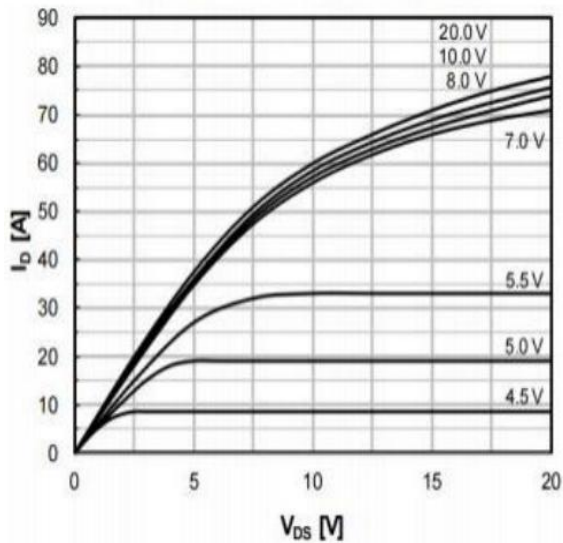


Figure2. Transfer Characteristics

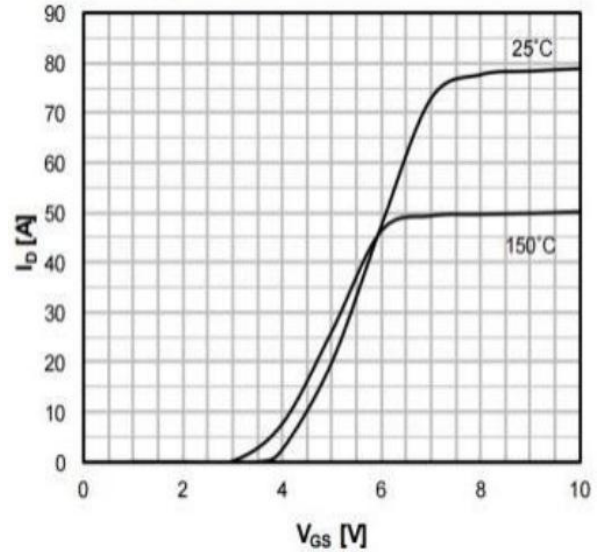


Figure 3. On-Resistance VS.Drain Current

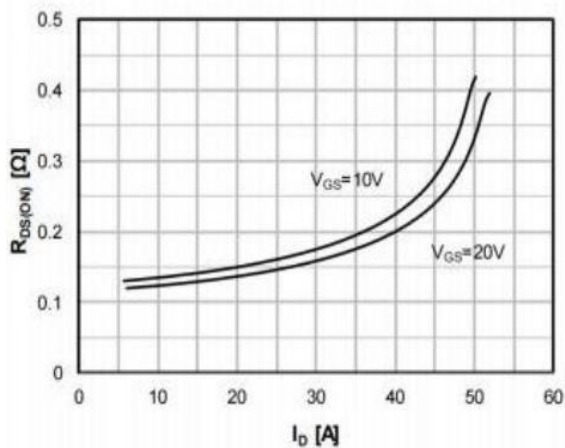


Figure 4. Capacitance

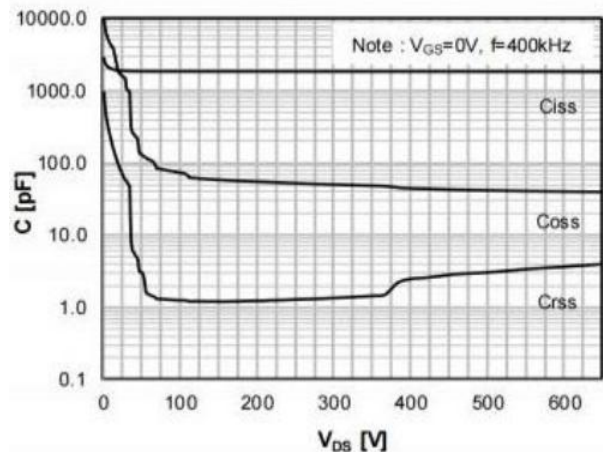


Figure 5. Gate Charge

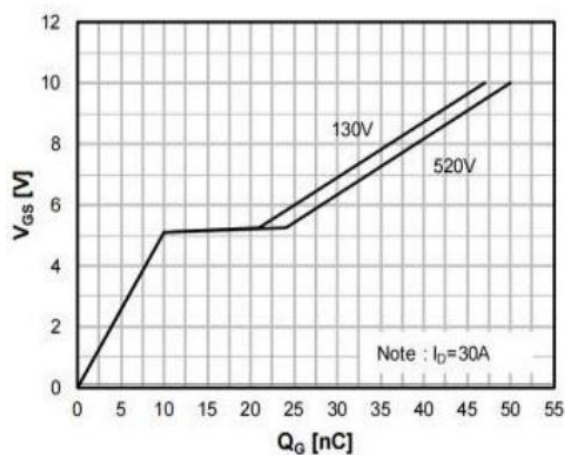
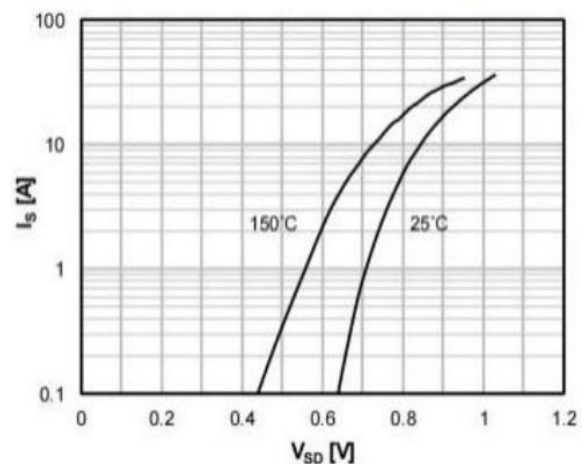


Figure 6. Body Diode Forward Voltage



Ratings and Characteristic Curves

Figure 7. On-Resistance vs. Junction Temperature

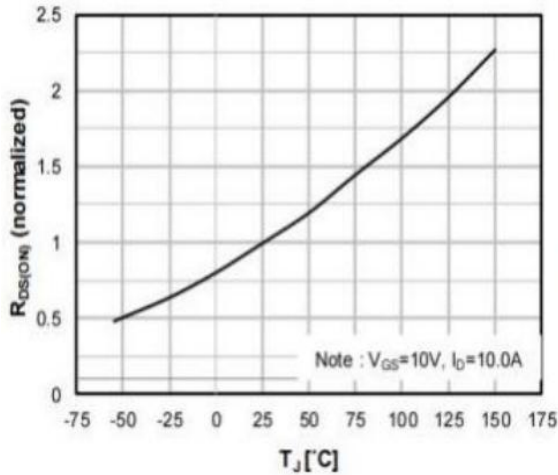


Figure 8. Breakdown Voltage vs. Junction Temperature

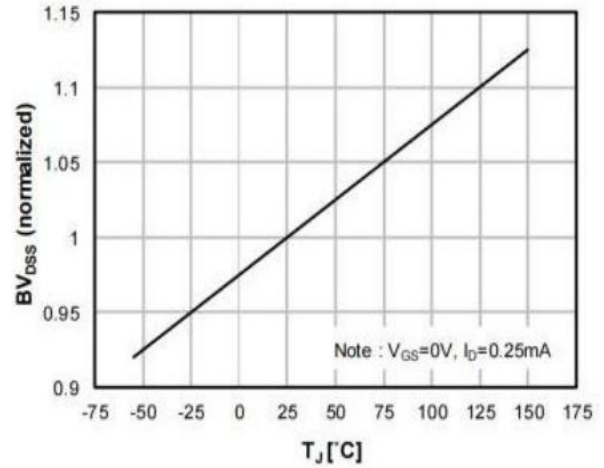


Figure 9. Safe operation area

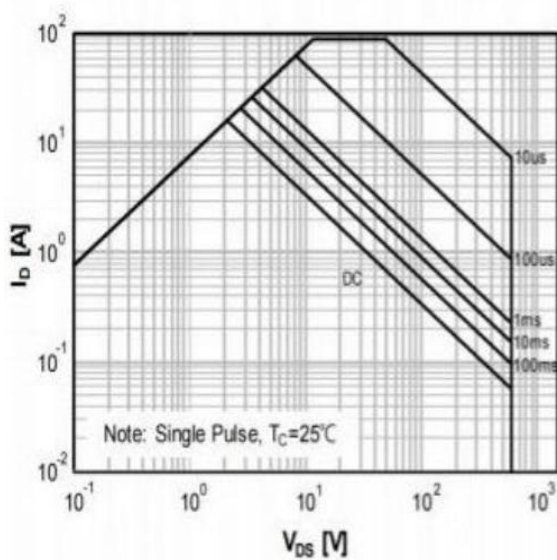
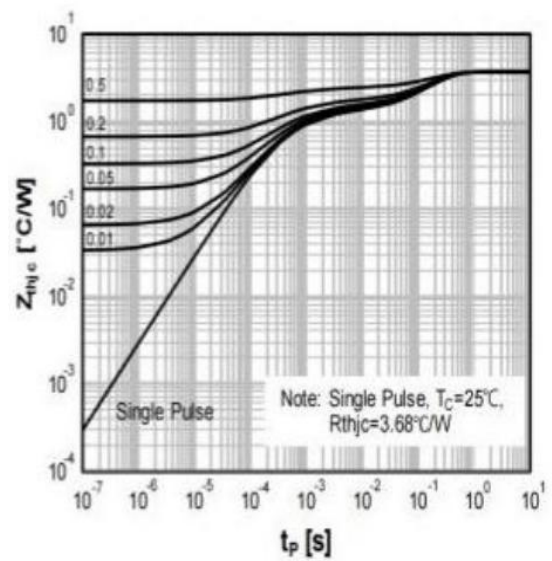
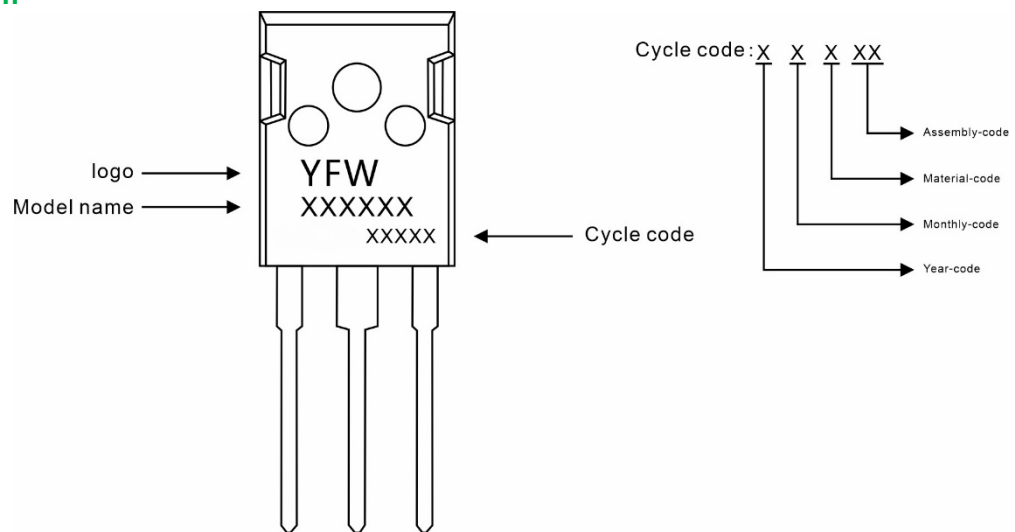


Figure 10. Transient Thermal Impedance



Marking Diagram



Ordering information

Model name	Package	Unit Weight	Base Quantity	Packing Quantity
YFW60R130AP	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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