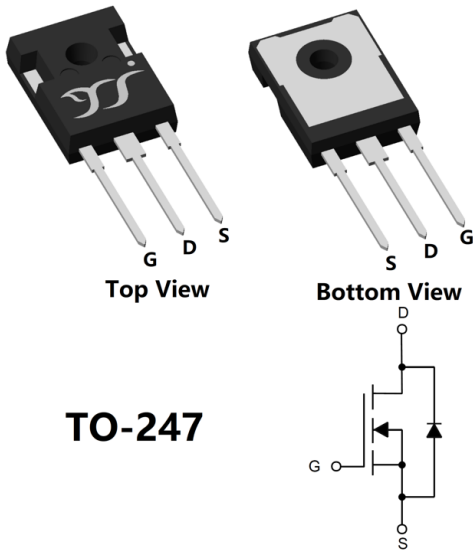


N-Channel Enhancement Mode Field Effect Transistor



Product Summary

- V_{DS} 600V
- I_D 102A
- $R_{DS(ON)}$ (at $V_{GS}=10V$) $< 18.5m\Omega$
- 100% EAS Tested
- 100% ∇V_{DS} Tested

General Description

- Excellent package for heat dissipation
- High density cell design for low $R_{DS(ON)}$
- Epoxy Meets UL 94 V-0 Flammability Rating
- Halogen Free

Applications

- EV Charger
- AC-DC Power Management
- Server/Telecom/PC Power

Limiting Values

Parameter	Conditions	Symbol	Min	Max	Unit	
Drain-source Voltage		V_{DS}	-	600	V	
Gate-source Voltage		V_{GS}	-20	20		
Continuous Drain Current (Note 1,2)	Steady-State	I_D	$T_A=25^\circ C, V_{GS}=10V$	-	8.2	A
			$T_A=100^\circ C, V_{GS}=10V$	-	5.2	
Continuous Drain Current (Note 1,3)	Steady-State		$T_C=25^\circ C, V_{GS}=10V, \text{Chip limitation}$	-	102	
			$T_C=100^\circ C, V_{GS}=10V$	-	64.5	
Pulsed Drain Current	$T_C=25^\circ C, t_p \leq 10\mu s$	I_{DM}	-	408		
Maximum Body-Diode Continuous Current	$T_C=25^\circ C$	I_S		102		
Maximum Body-Diode Pulsed Current	$T_C=25^\circ C, t_p \leq 10\mu s$	I_{SM}	-	408		
Avalanche energy (non-repetitive)	$T_J=25^\circ C, V_G=10V, R_G=25\Omega, L=30mH, I_{AS}=12A$	EAS	-	2160	mJ	
Total Power Dissipation (Note 1,2)	Steady-State	P_D	$T_A=25^\circ C$	-	3.1	W
			$T_A=100^\circ C$	-	1.2	
Total Power Dissipation (Note 1,3)	Steady-State		$T_C=25^\circ C$	-	480	
			$T_C=100^\circ C$	-	192	
MOSFET dv/dt ruggedness	$V_{DS}=0 \dots 300V, R_G=0\Omega$	dv/dt	-	50	V/ns	
Reverse diode dv/dt	$V_{DS}=0 \dots 300V, I_D \leq 100A, di/dt=200A/\mu s$	dv/dt	-	28		
Maximum diode commutation speed	$V_{DS}=0 \dots 300V, I_D \leq 100A, R_G=0\Omega$	dif/dt	-	6940	A/ μs	
Junction and Storage Temperature Range		T_J, T_{STG}	-55	150	$^\circ C$	

Thermal resistance

Parameter	Symbol	Typ	Max	Units
Thermal Resistance Junction-to-Ambient (Note 2)	$R_{\theta JA}$	-	40	$^\circ C/W$
Thermal Resistance Junction-to-Case	$R_{\theta JC}$	-	0.26	

Ordering Information (Example)

PREFERRED P/N	PACKING CODE	Marking	MINIMUM PACKAGE(pcs)	INNER BOX QUANTITY(pcs)	OUTER CARTON QUANTITY(pcs)	DELIVERY MODE
YJW018C60CF	B1	YJW018C60CF	30	360	1800	Tube



YJW018C60CF

■ Electrical Characteristics

Parameter	Symbol	Conditions	Min	Typ	Max	Units
Static Parameter						
Drain-Source Breakdown Voltage	BV_{DSS}	$V_{GS}=0V, I_D=1mA, T_j=25^\circ C$	600	-	-	V
		$V_{GS}=0V, I_D=30mA, T_j=25^\circ C$	600	-	-	V
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS}=600V, V_{GS}=0V, T_j=25^\circ C$	-	-	10	μA
Gate-Source Leakage Current	I_{GSS}	$V_{GS}=\pm 20V, V_{DS}=0V, T_j=25^\circ C$	-	-	± 100	nA
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS}=V_{GS}, I_D=1mA, T_j=25^\circ C$	3	-	5	V
Static Drain-Source On-Resistance	$R_{DS(on)}$	$V_{GS}=10V, I_D=58A, T_j=25^\circ C$	-	15.5	18.5	m Ω
		$V_{GS}=10V, I_D=58A, T_j=150^\circ C$	-	38.64	46.12	
Diode Forward Voltage	V_{SD}	$I_S=58A, V_{GS}=0V, T_j=25^\circ C$	-	0.99	1.3	V
Gate resistance	R_G	$f=1MHz, T_j=25^\circ C$	-	0.9	-	Ω
Dynamic Parameters						
Input Capacitance	C_{iss}	$V_{DS}=300V, V_{GS}=0V, f=1MHz, T_j=25^\circ C$	-	11085	-	pF
Output Capacitance	C_{oss}		-	190	-	
Reverse Transfer Capacitance	C_{rss}		-	10	-	
Effective output capacitance, energy related	$C_{o(er)}$	$V_{DS}=0\dots 300V, V_{GS}=0V, f=1MHz, T_j=25^\circ C$	-	546	-	
Effective output capacitance, time related	$C_{o(tr)}$		-	5340	-	
Switching Parameters						
Total Gate Charge	Q_g	$V_{GS}=10V, V_{DS}=300V, I_D=58A, T_j=25^\circ C$	-	278.3	-	nC
Gate-Source Charge	Q_{gs}		-	69.5	-	
Gate-Drain Charge	Q_{gd}		-	132.7	-	
Reverse Recovery Charge	Q_{rr}	$I_F=58A, di/dt=100A/\mu s, V_{GS}=0V, V_R=300V, T_j=25^\circ C$	-	1588	-	nC
Reverse Recovery Time	t_{rr}		-	200	-	ns
Peak Reverse Recovery Current	I_{rrm}		-	12	-	A
Turn-on Delay Time	$t_{D(on)}$	$V_{GS}=10V, V_{DS}=300V, I_D=58A, R_{GEN}=3\Omega, T_j=25^\circ C$	-	140	-	ns
Turn-on Rise Time	t_r		-	32	-	
Turn-off Delay Time	$t_{D(off)}$		-	137	-	
Turn-off fall Time	t_f		-	6.5	-	

Note:

- The entire application environment impacts the thermal resistance values shown, they are not constants and are only valid for the particular conditions noted.
- The value of $R_{\theta JA}$ is measured in the still air environment with $T_A=25^\circ C$. The maximum allowed junction temperature of $150^\circ C$.
- Thermal resistance from junction to soldering point (on the exposed drain pad)



Typical Electrical and Thermal Characteristics Diagrams

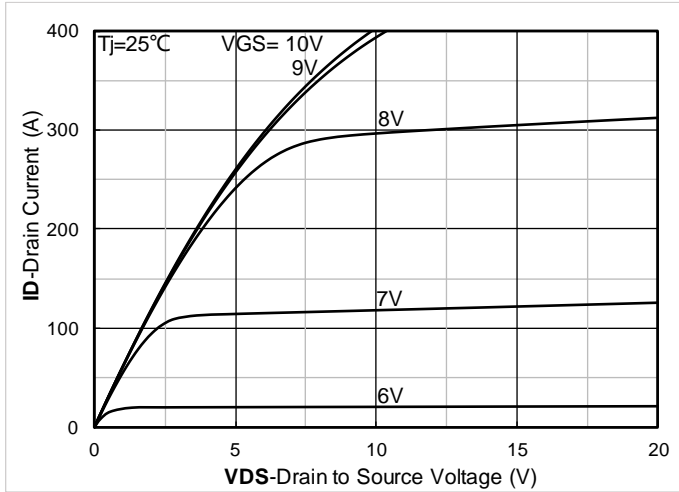


Figure 1. Output Characteristics; typical values

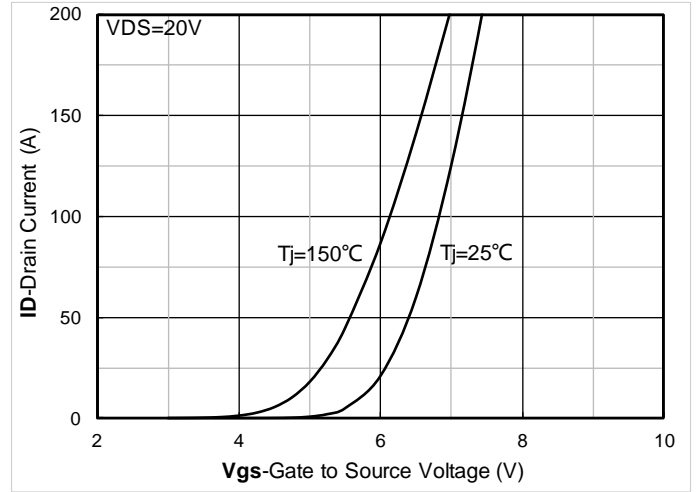


Figure 2. Transfer Characteristics; typical values

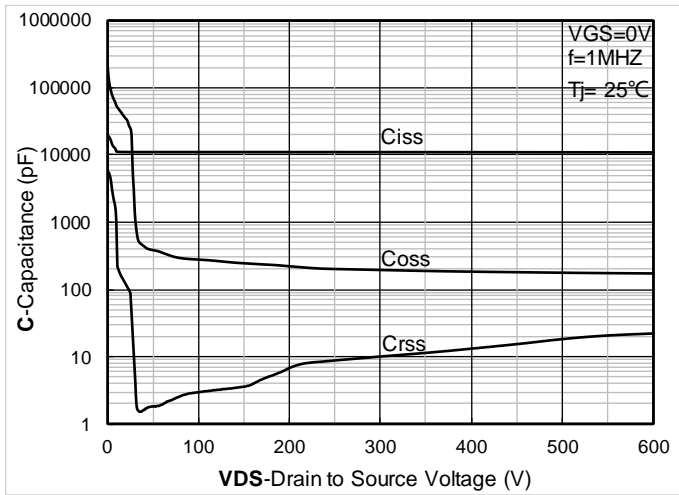


Figure 3. Capacitance Characteristics; typical values

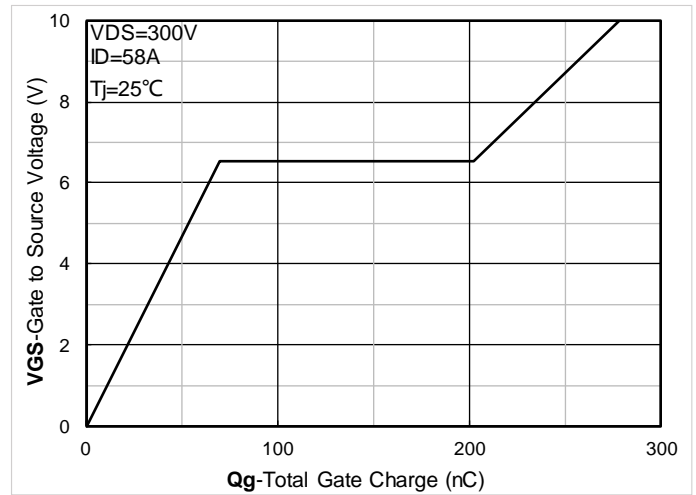


Figure 4. Gate Charge; typical values

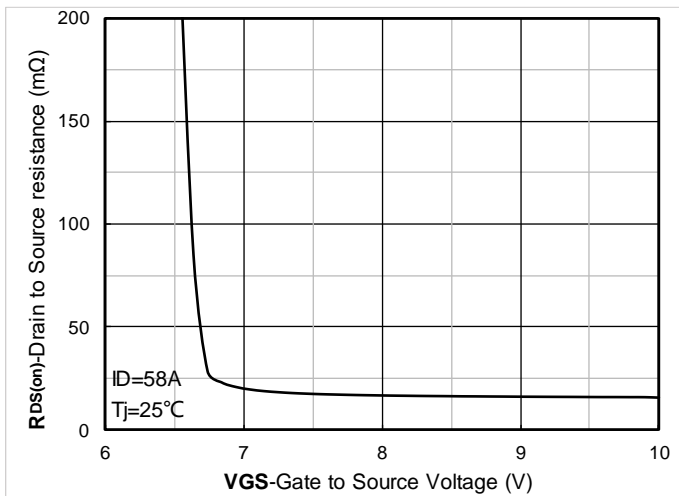


Figure 5. On-Resistance vs Gate to Source Voltage; typical values

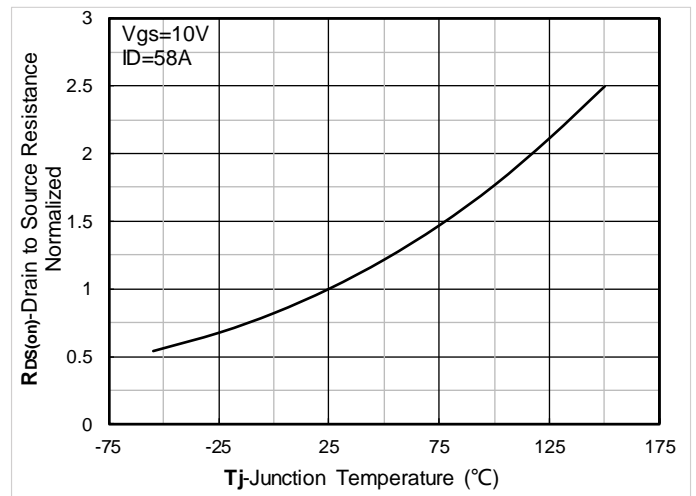


Figure 6. Normalized On-Resistance



YJW018C60CF

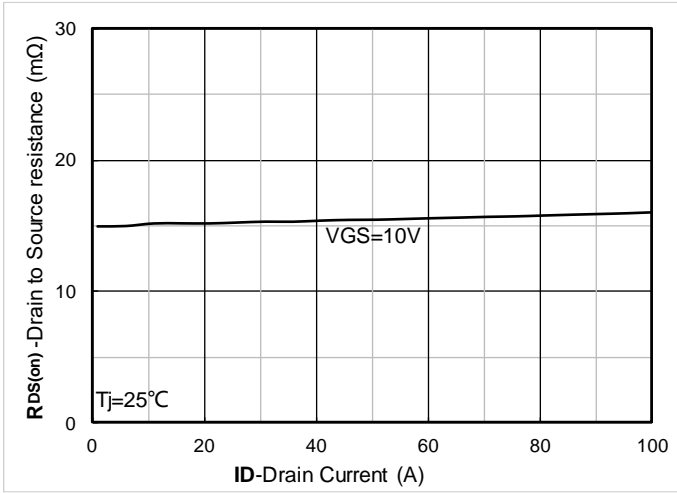


Figure 7. RDS(on) VS Drain Current; typical values

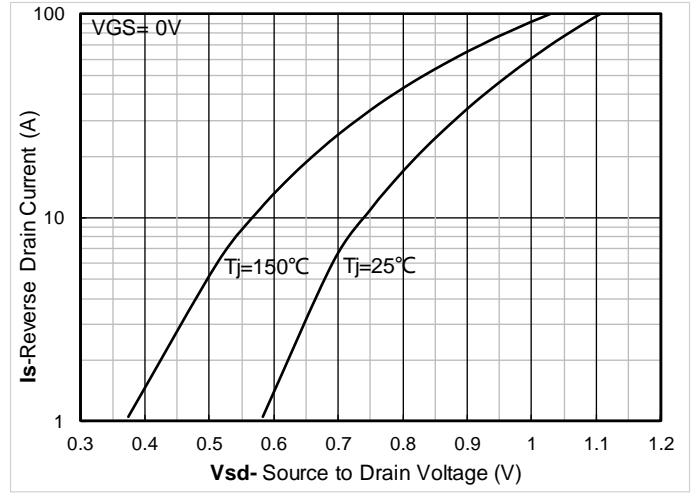


Figure 8. Forward characteristics of reverse diode; typical values

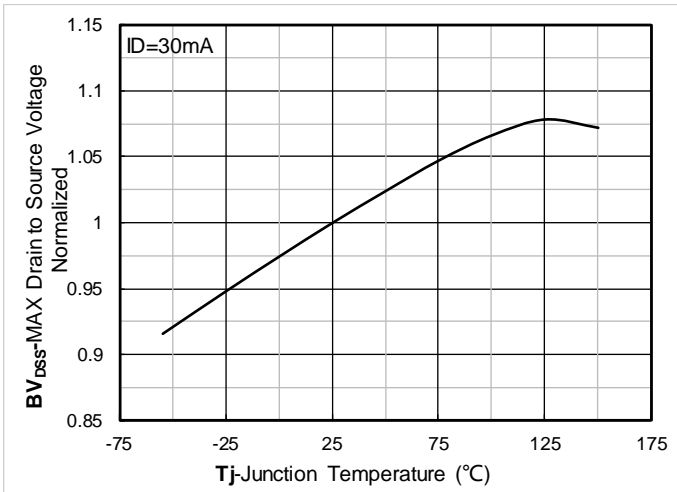


Figure 9. Normalized breakdown voltage

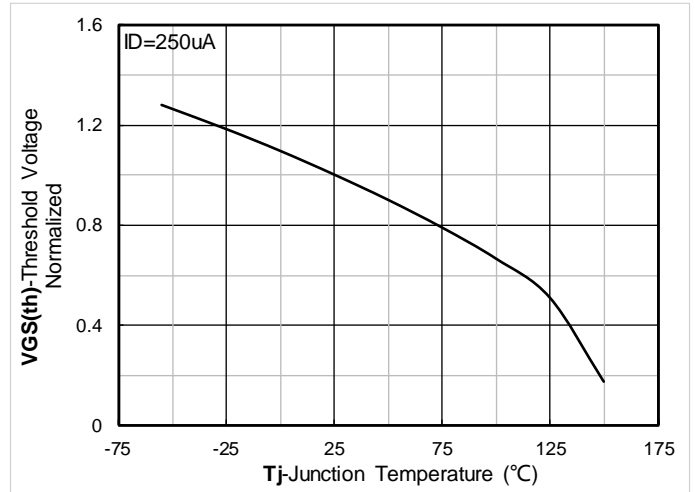


Figure 10. Normalized Threshold voltage

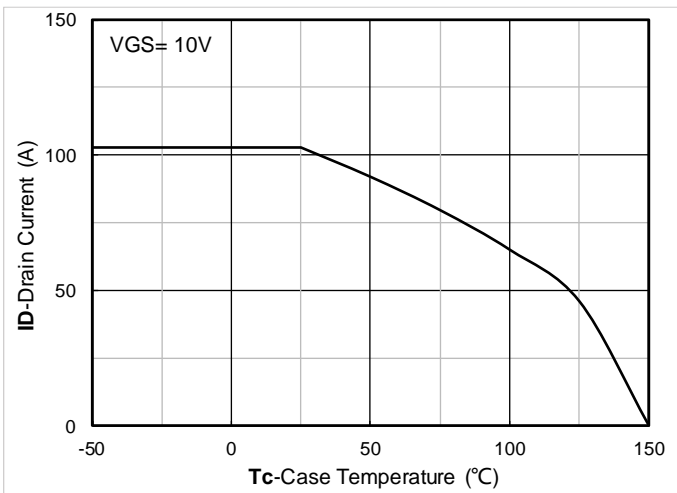


Figure 11. Current dissipation

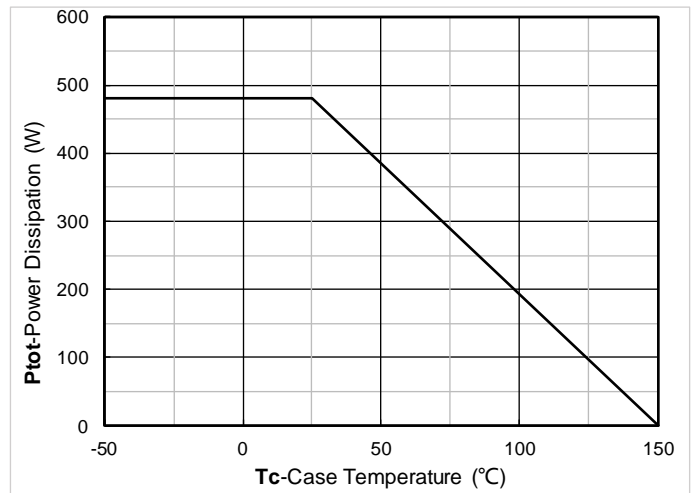


Figure 12. Power dissipation



YJW018C60CF

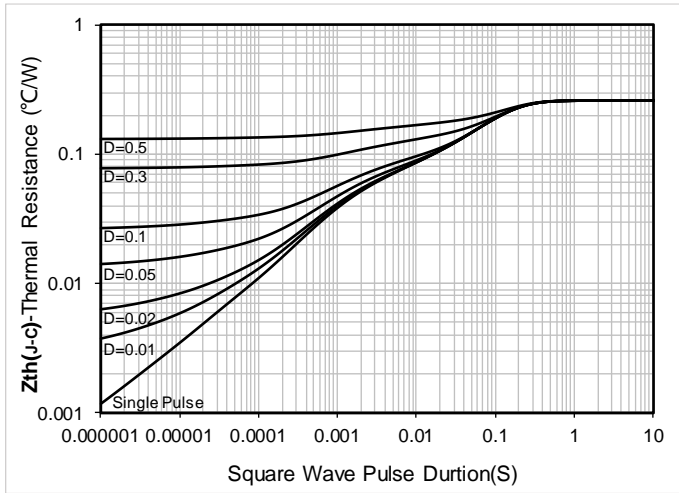


Figure 13. Maximum Transient Thermal Impedance

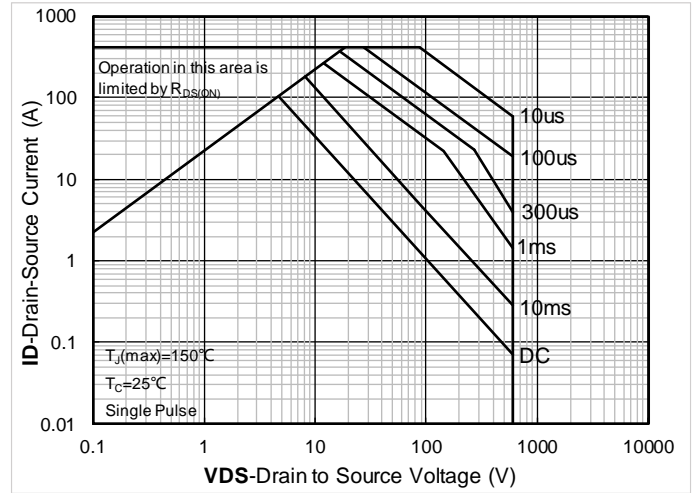


Figure 14. Safe Operation Area

■ Test Circuits & Waveforms

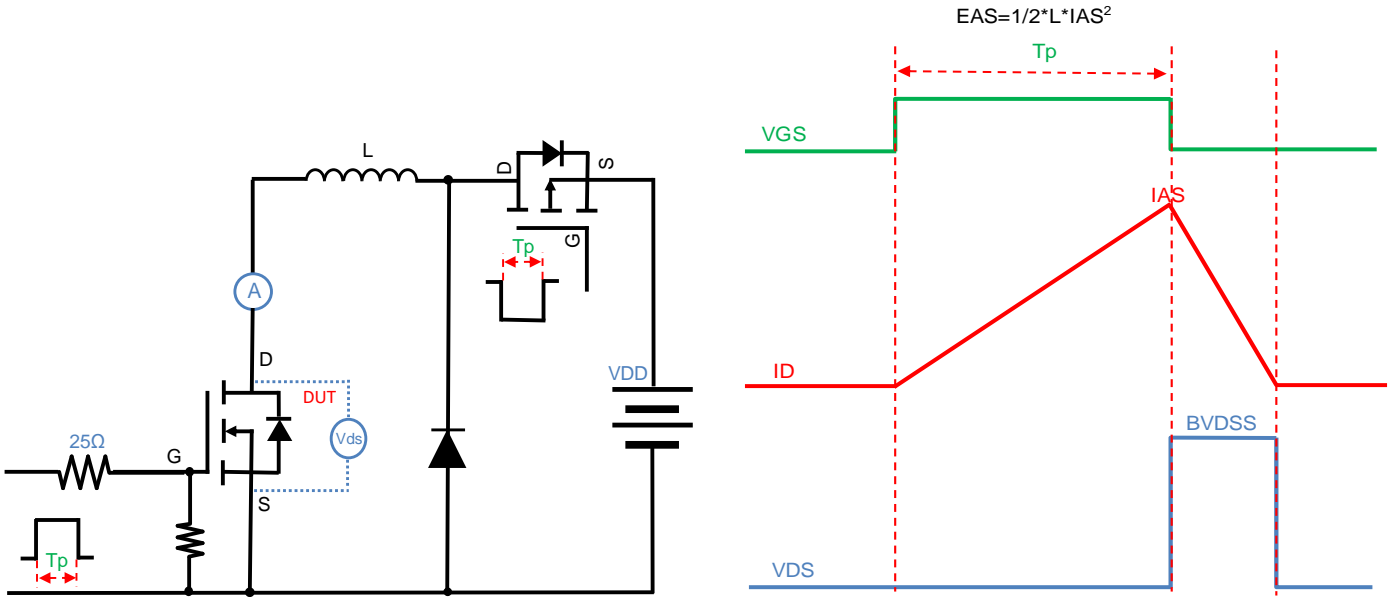


Figure A. Unclamped Inductive Switching (UIS) Test Circuit & Waveform

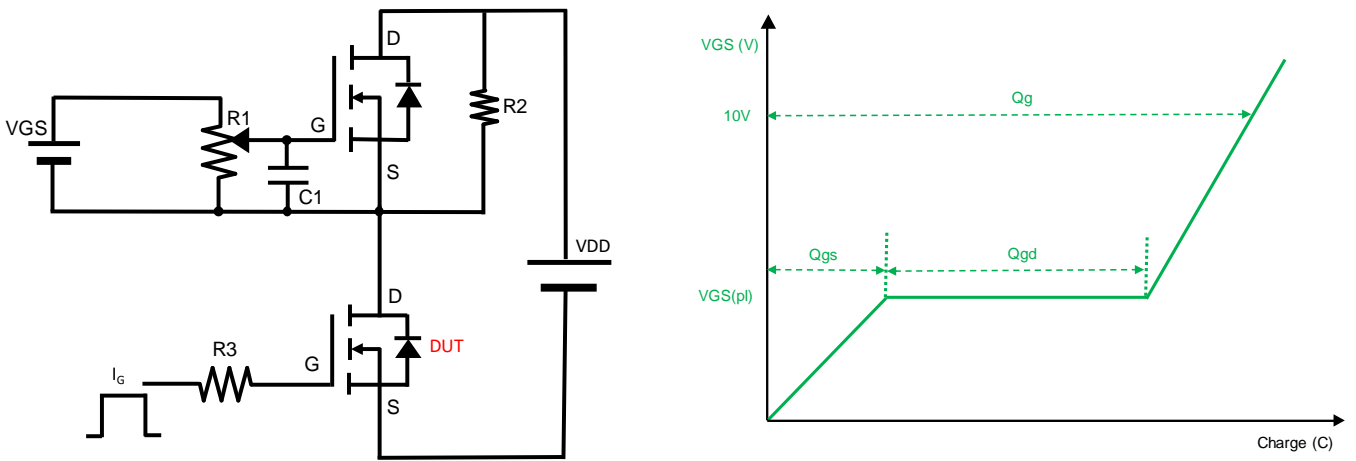


Figure B. Gate Charge Test Circuit & Waveform

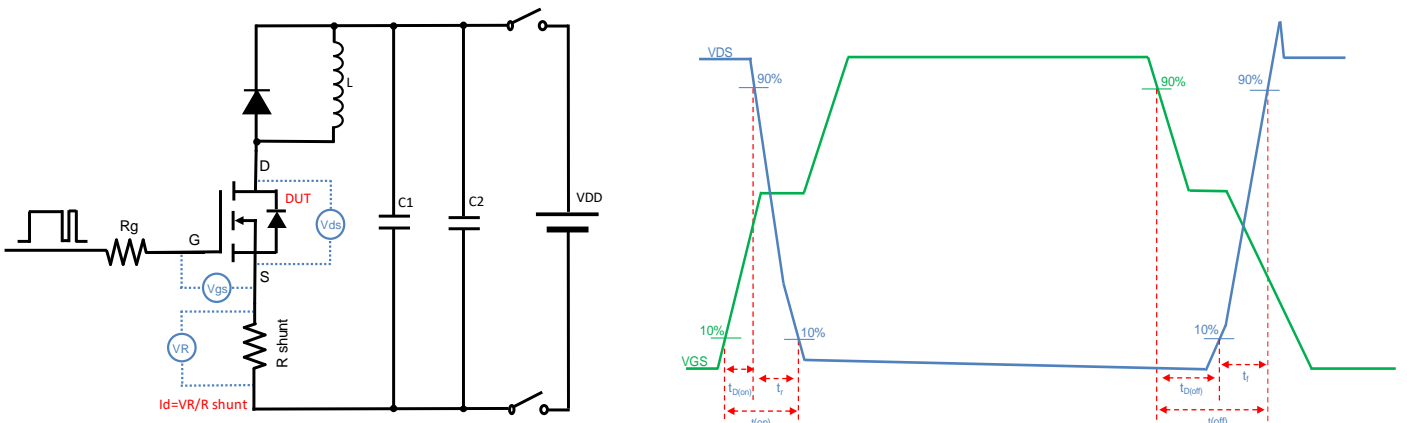


Figure C. Resistive Switching Test Circuit & Waveform

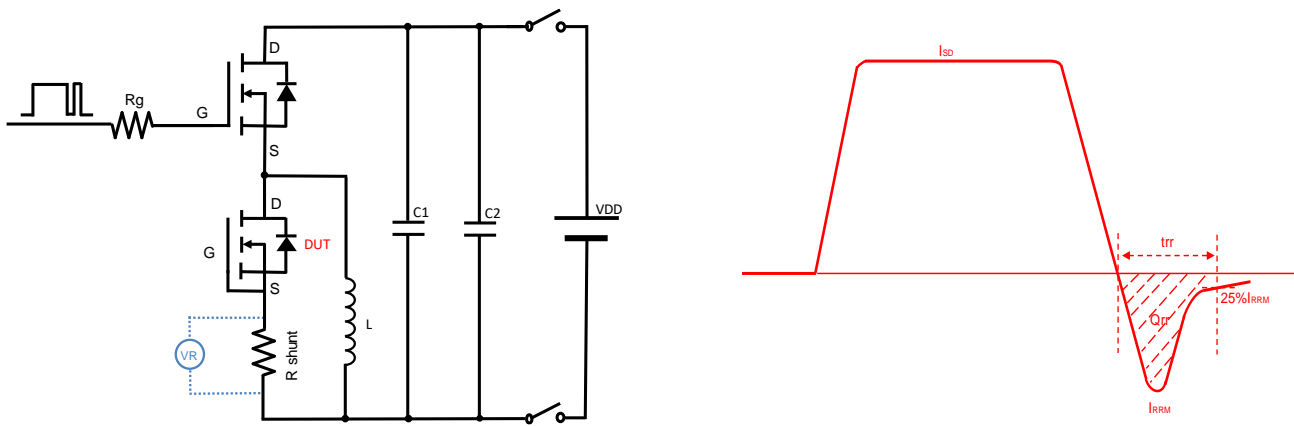
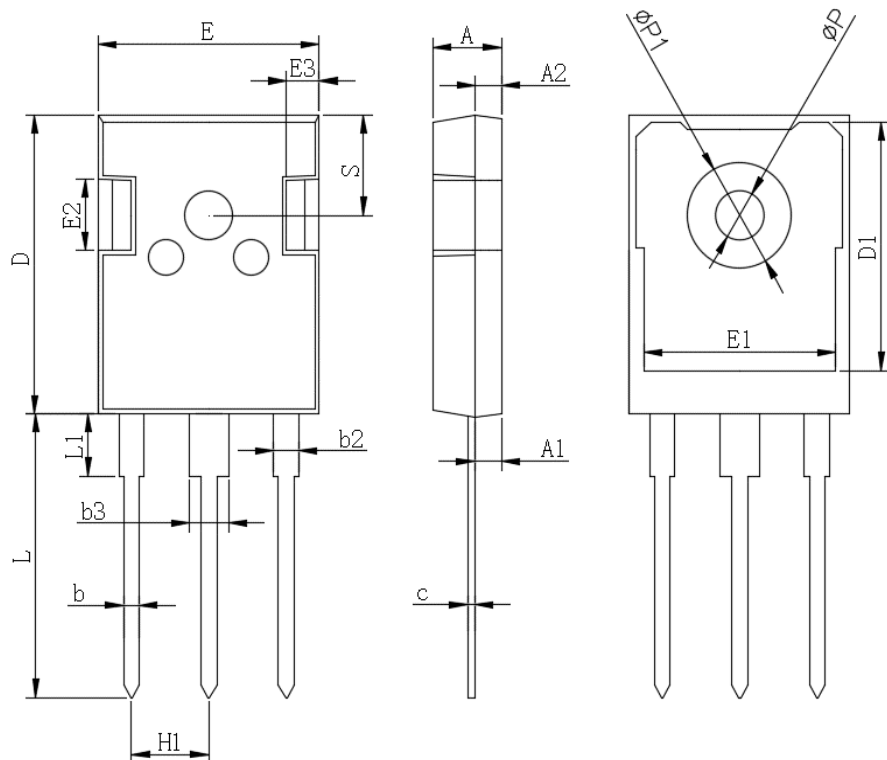


Figure D. Diode Recovery Test Circuit & Waveform

■ TO-247AB Package information

TO-247AB



TO-247AB		
Dim	Min	Max
A	4.80	5.20
A1	2.21	2.61
A2	1.85	2.15
b	1.0	1.4
b2	1.91	2.21
c	0.5	0.7
D	20.70	21.30
D1	16.25	16.85
E	15.50	16.10
E1	13.0	13.6
E2	4.80	5.20
E3	2.30	2.70
L	19.62	20.22
L1	-	4.30
ϕP	3.40	3.80
$\phi P1$	-	7.30
S	6.15TYP	
H1	5.44TYP	
b3	2.80	3.20



YJW018C60CF

Disclaimer

The information presented in this document is for reference only. Yangzhou Yangjie Electronic Technology Co., Ltd. reserves the right to make changes without notice for the specification of the products displayed herein to improve reliability, function or design or otherwise.

The product listed herein is designed to be used with ordinary electronic equipment or devices, and not designed to be used with equipment or devices which require high level of reliability and the malfunction of which would directly endanger human life (such as medical instruments, transportation equipment, aerospace machinery, nuclear-reactor controllers, fuel controllers and other safety devices), Yangjie or anyone on its behalf, assumes no responsibility or liability for any damages resulting from such improper use of sale.

This publication supersedes & replaces all information previously supplied. For additional information, please visit our website <http://www.21yangjie.com> , or consult your nearest Yangjie's sales office for further assistance.