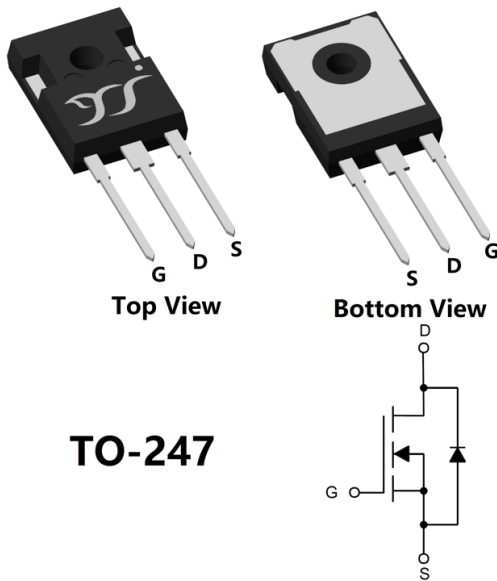


N-Channel Enhancement Mode Field Effect Transistor



TO-247

Product Summary

• V_{DS}	600V
• I_D	77A
• $R_{DS(ON)}$ (at $V_{GS}=10V$)	<35mΩ
• 100% EAS Tested	
• 100% ∇V_{DS} Tested	
• ESD Level(HBM)	H3A

General Description

- Super Junction High Voltage MOSFET technology
- Intrinsic fast-recovery body diode
- 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

- Microinverter

Limiting Values

Parameter	Conditions		Symbol	Min	Max	Unit
Drain-source Voltage			V_{DS}	-	600	V
Gate-source Voltage			V_{GS}	-30	30	
Continuous Drain Current (Note 1,2)	Steady-State	$T_A=25^{\circ}C, V_{GS}=10V$	I_D	-	5.8	A
		$T_A=100^{\circ}C, V_{GS}=10V$		-	3.7	
Continuous Drain Current (Note 1,3)	Steady-State	$T_C=25^{\circ}C, V_{GS}=10V$		-	77	
		$T_C=100^{\circ}C, V_{GS}=10V$		-	48.7	
Pulsed Drain Current	$T_C=25^{\circ}C, t_p \leq 10\mu s$		I_{DM}	-	308	A
Maximum Body-Diode Continuous Current	$T_C=25^{\circ}C$		I_S		77	
Maximum Body-Diode Pulsed Current	$T_C=25^{\circ}C, t_p \leq 10\mu s$		I_{SM}	-	308	
Avalanche Energy (non-repetitive)	$T_J=25^{\circ}C, V_G=10V, R_G=25\Omega, L=30mH, I_{AS}=9.1A$		EAS	-	1242	mJ
Total Power Dissipation (Note 1,2)	Steady-State	$T_A=25^{\circ}C$	P_D	-	2.84	W
		$T_A=100^{\circ}C$		-	1.13	
Total Power Dissipation (Note 1,3)	Steady-State	$T_C=25^{\circ}C$		-	500	
		$T_C=100^{\circ}C$		-	200	
MOSFET dv/dt Ruggedness	$V_{DS}=0 \dots 300V, I_D \leq 25A, R_G=2\Omega$		dv/dt	-	120.3	V/ns
Reverse Diode dv/dt	$V_{DS}=0 \dots 300V, I_D \leq 25A, di/dt=100A/\mu s$		dv/dt	-	49.1	
Maximum Diode Commutation Speed	$V_{DS}=0 \dots 300V, I_D \leq 25A, R_G=2\Omega$		dif/dt	-	3007	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)	Steady-State	$R_{\theta JA}$	-	44	$^{\circ}C/W$
Thermal Resistance Junction-to-Case	Steady-State	$R_{\theta JC}$	-	0.25	



YJW035C60DF

■ 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℃	600	-	-	V
Zero Gate Voltage Drain Current	I _{DSS}	V _{DS} =600V, V _{GS} =0V, T _J =25℃	-	-	1	μA
		V _{DS} =600V, V _{GS} =0V, T _J =125℃	-	-	100	
Gate-Source Leakage Current	I _{GSS}	V _{GS} =±30V, V _{DS} =0V, T _J =25℃	-	-	±100	nA
Gate Threshold Voltage	V _{GS(th)}	V _{DS} =V _{GS} , I _D =250μA, T _J =25℃	3	4	5	V
Static Drain-Source On-Resistance	R _{DS(on)}	V _{GS} =10V, I _D =25A, T _J =25℃	-	29	35	mΩ
		V _{GS} =10V, I _b =25A, T _J =150℃	-	69	83	
Diode Forward Voltage	V _{SD}	I _S =25A, V _{GS} =0V, T _J =25℃	-	0.89	1.2	V
Gate Resistance	R _G	f=1MHz, T _J =25℃	-	4	-	Ω
Dynamic Parameters						
Input Capacitance	C _{iss}	V _{DS} =300V, V _{GS} =0V, f=1MHz, T _J =25℃	-	5213	-	pF
Output Capacitance	C _{oss}		-	103	-	
Reverse Transfer Capacitance	C _{rss}		-	11	-	
Effective Output capacitance, Energy Related	C _{o(er)}	V _{DS} =0...300V, V _{GS} =0V, f=1MHz, T _J =25℃	-	291	-	
Effective Output Capacitance, Time Related	C _{o(tr)}		-	2375	-	
Switching Parameters						
Total Gate Charge	Q _g	V _{GS} =10V, V _{DS} =300V, I _b =25A, T _J =25℃	-	135.3	-	nC
Gate-Source Charge	Q _{gs}		-	34.3	-	
Gate-Drain Charge	Q _{gd}		-	66.5	-	
Reverse Recovery Charge	Q _{rr}	I _F =25A, di/dt=100A/μs, V _{GS} =0V, V _R =300V, T _J =25℃	-	1463	-	nC
Reverse Recovery Time	t _{rr}		-	172.5	-	ns
Peak Reverse Recovery Current	I _{rrm}		-	14.6	-	A
Turn-on Delay Time	t _{D(on)}	V _{GS} =10V, V _{DS} =300V, I _b =25A, R _{GEN} =3Ω, T _J =25℃	-	176.3	-	ns
Turn-on Rise Time	t _r		-	36.8	-	
Turn-off Delay Time	t _{D(off)}		-	108	-	
Turn-off Fall Time	t _f		-	17.6	-	

Note:

1. The entire application environment impacts the thermal resistance values shown, they are not constants and are only valid for the particular conditions noted.
2. 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 $150^{\circ}C$.
3. Thermal resistance from junction to soldering point (on the exposed drain pad).



■ Typical Electrical and Thermal Characteristics Diagrams

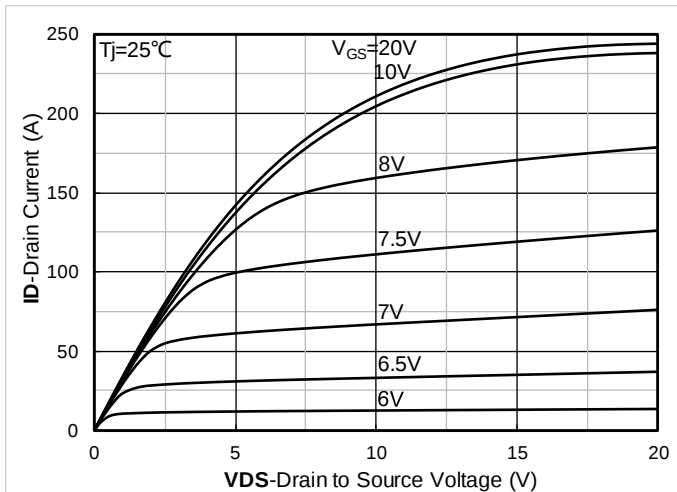


Figure 1. Output Characteristics; typical values

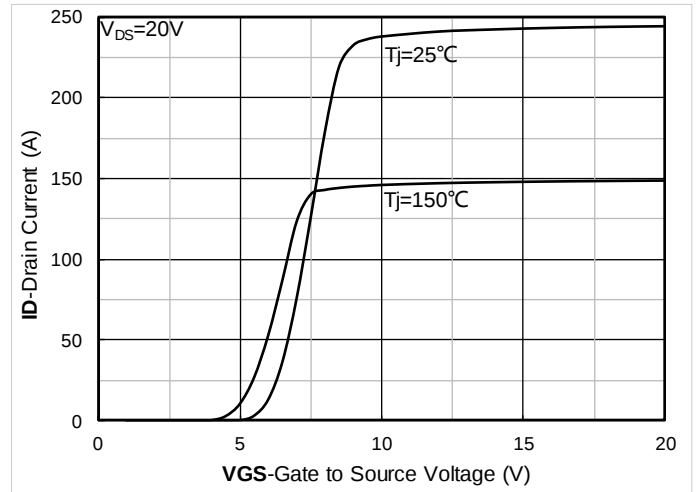


Figure 2. Transfer Characteristics; typical values

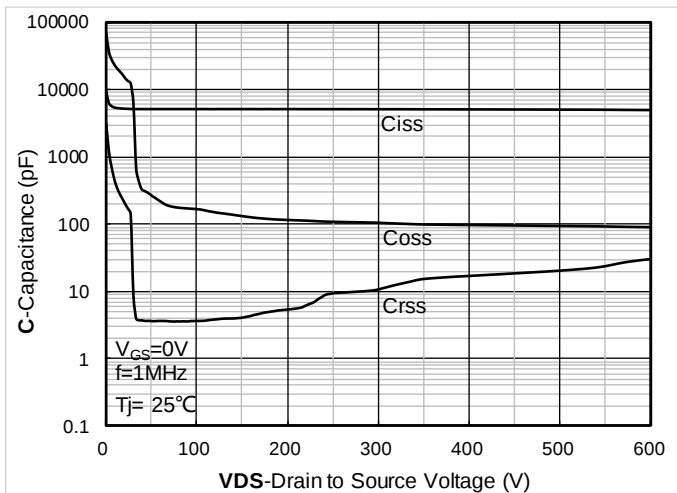


Figure 3. Capacitance Characteristics; typical values

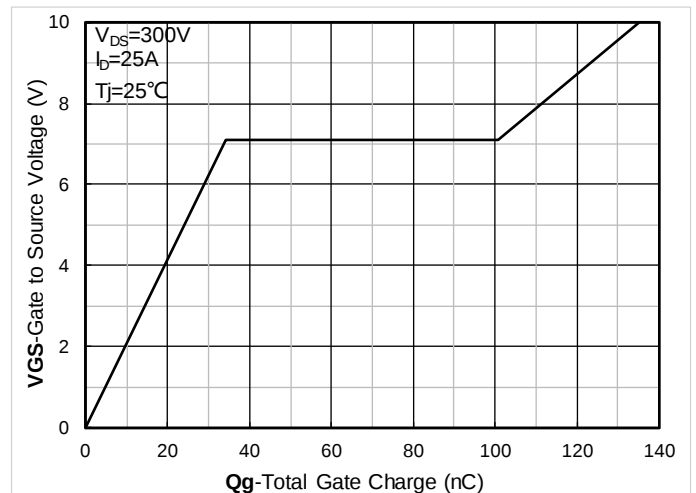


Figure 4. Gate Charge; typical values

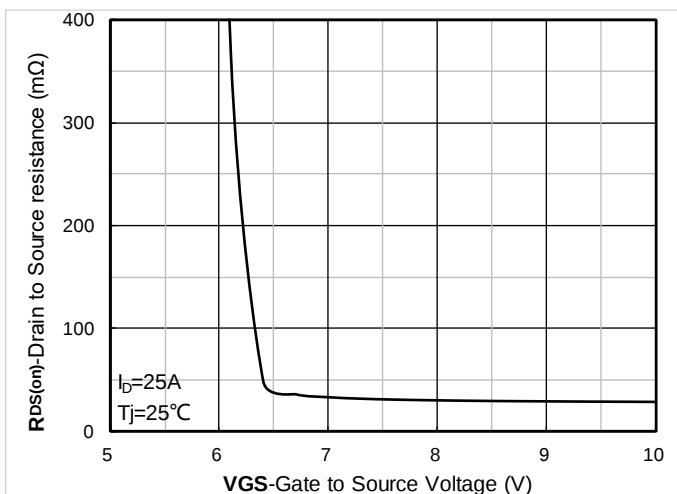


Figure 5. On-Resistance vs. Gate to Source Voltage; typical values

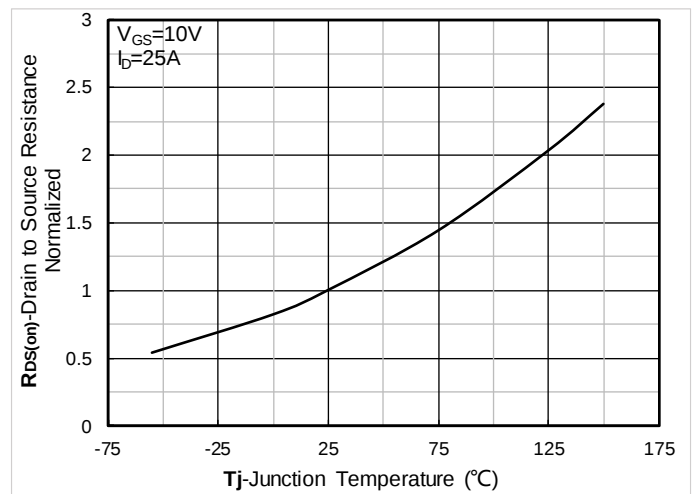


Figure 6. Normalized On-Resistance

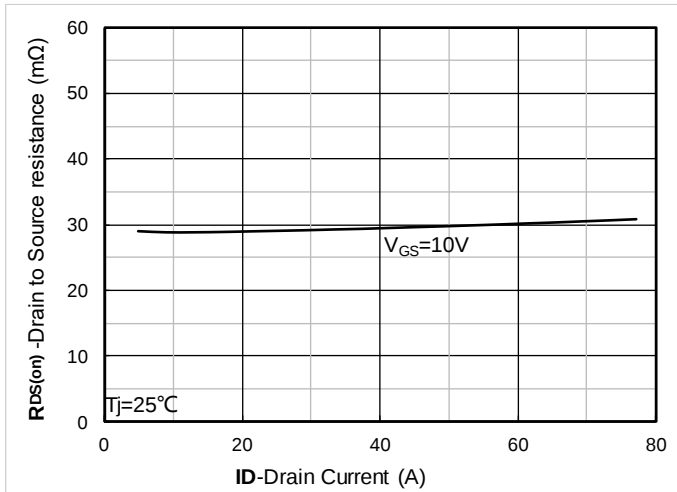


Figure 7. RDS(on) vs. Drain Current; typical values

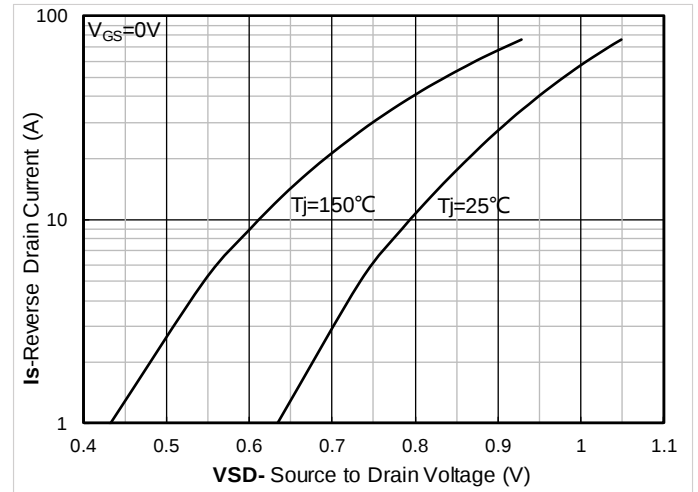


Figure 8. Forward characteristics of reverse diode; typical values

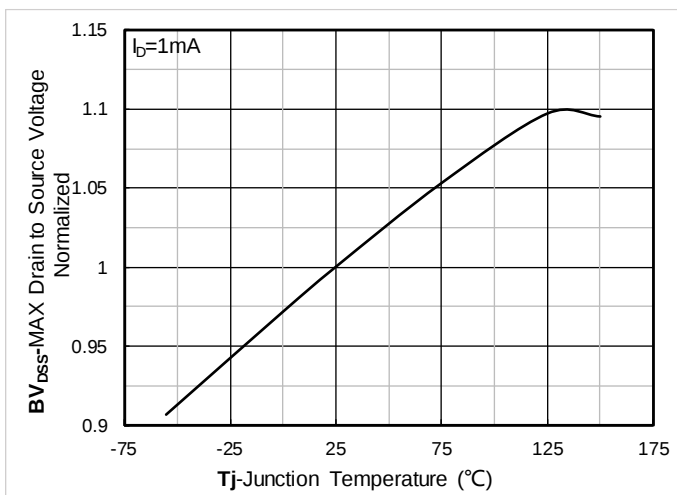


Figure 9. Normalized breakdown voltage

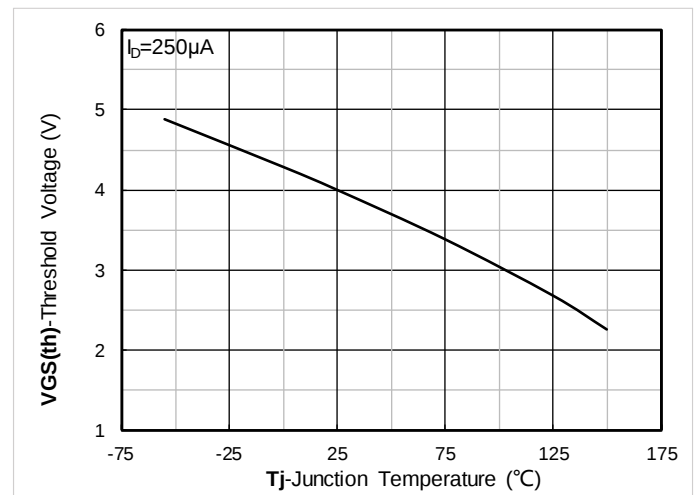


Figure 10. Gate Threshold voltage; typical values

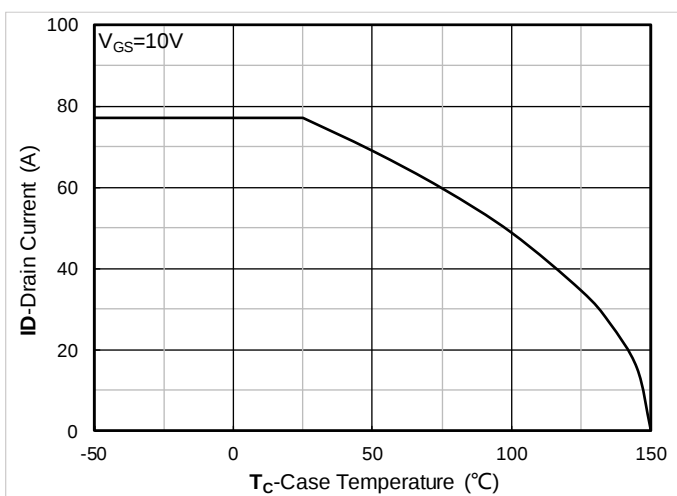


Figure 11. Current dissipation

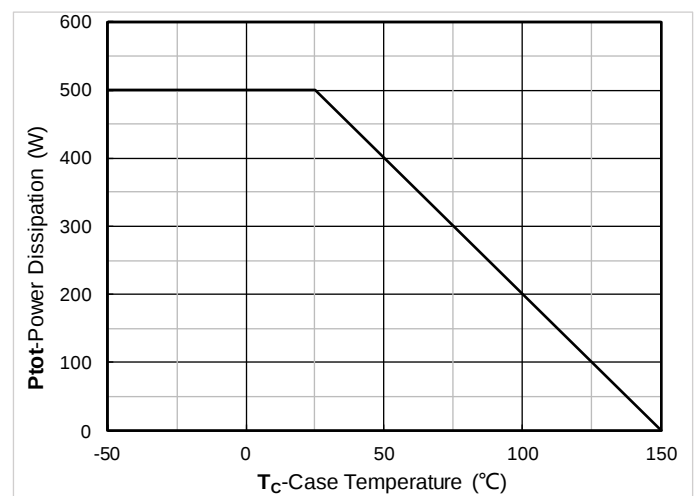


Figure 12. Power dissipation

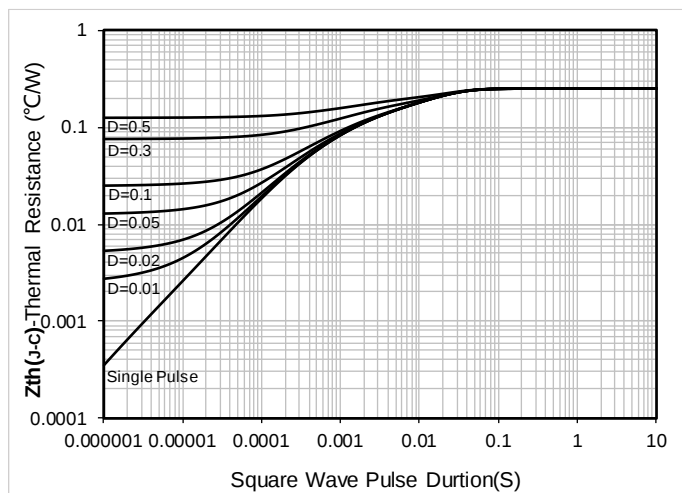


Figure 13. Maximum Transient Thermal Impedance

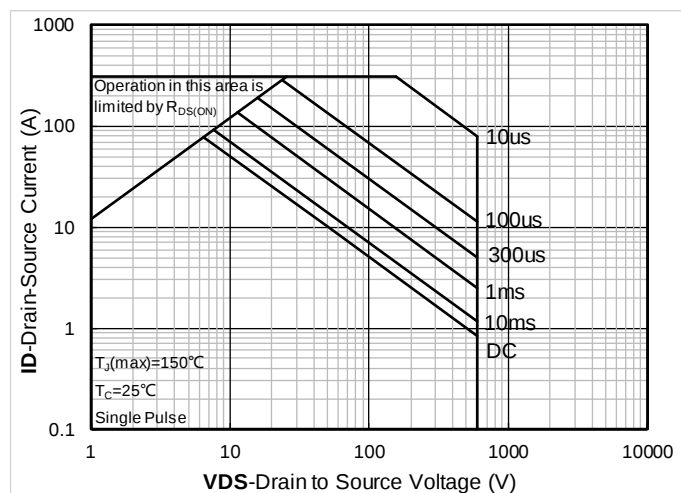


Figure 14. Safe Operation Area

■ Test Circuits & Waveforms

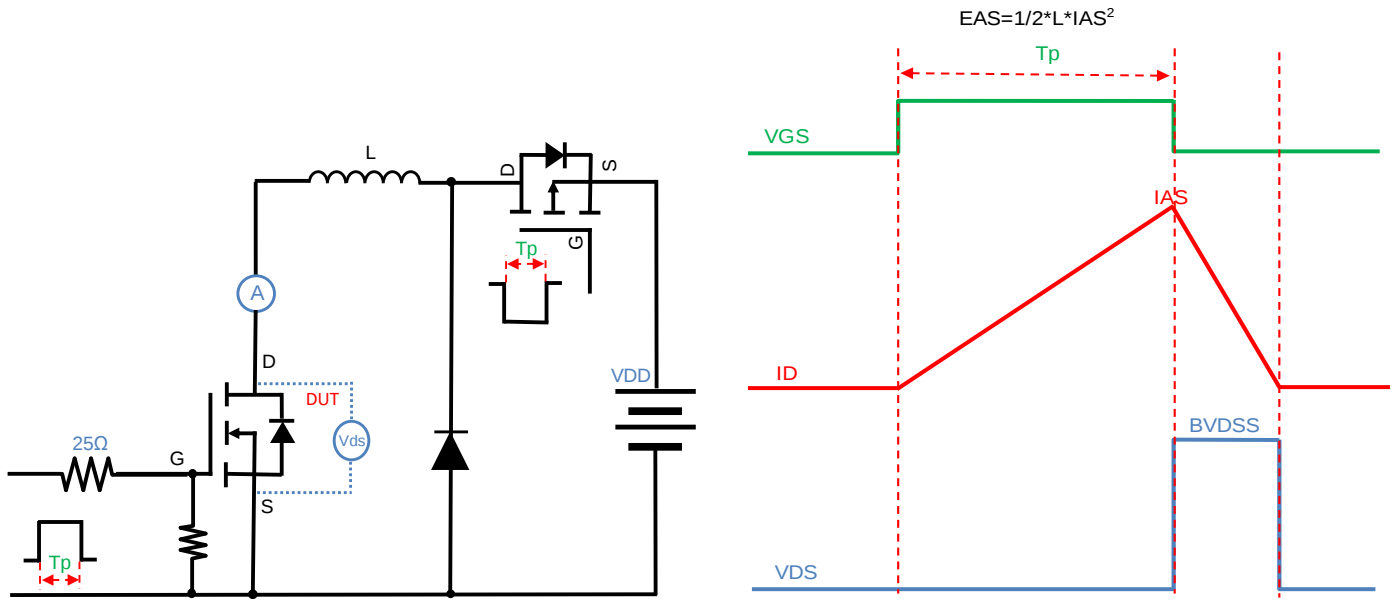


Figure A. Unclamped Inductive Switching (UIS) Test Circuit & Waveform

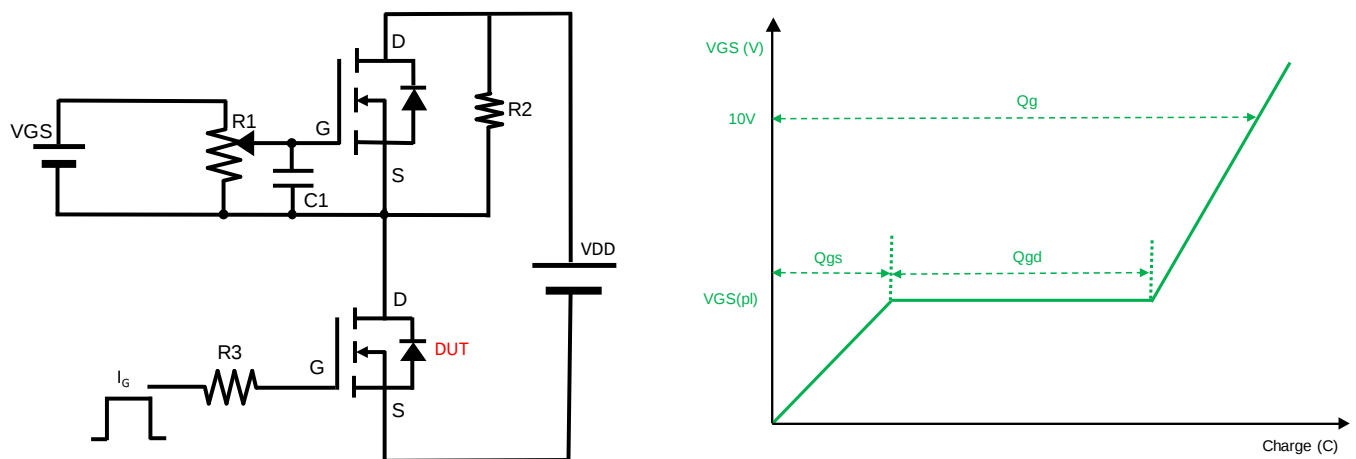


Figure B. Gate Charge Test Circuit & Waveform

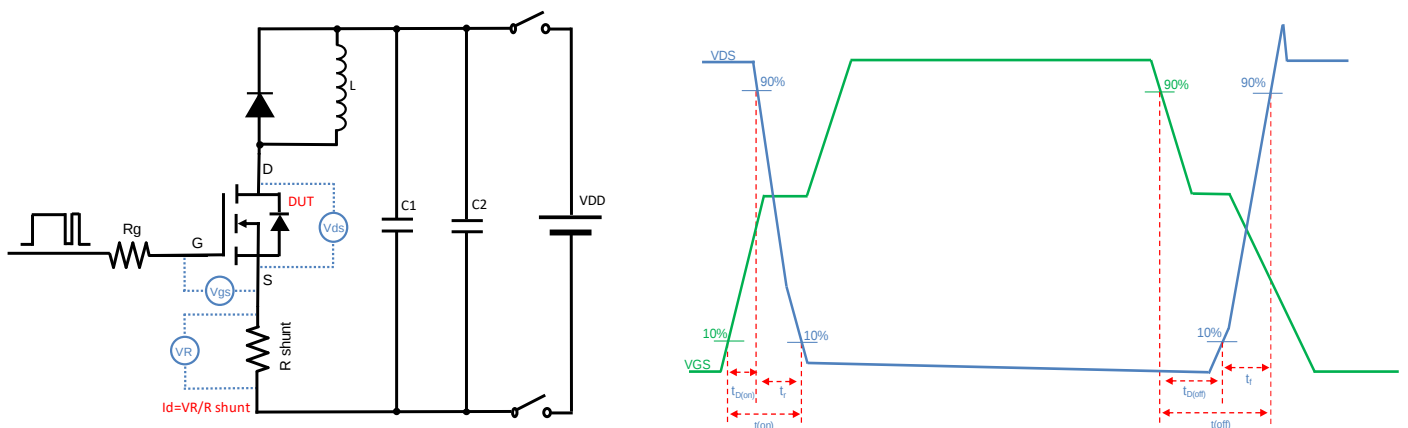


Figure C. Resistive Switching Test Circuit & Waveform

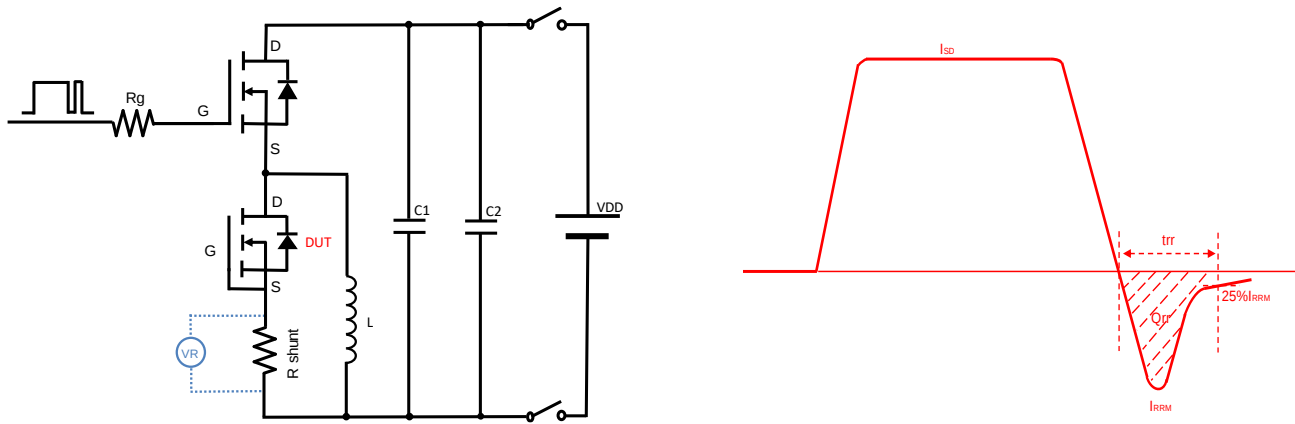
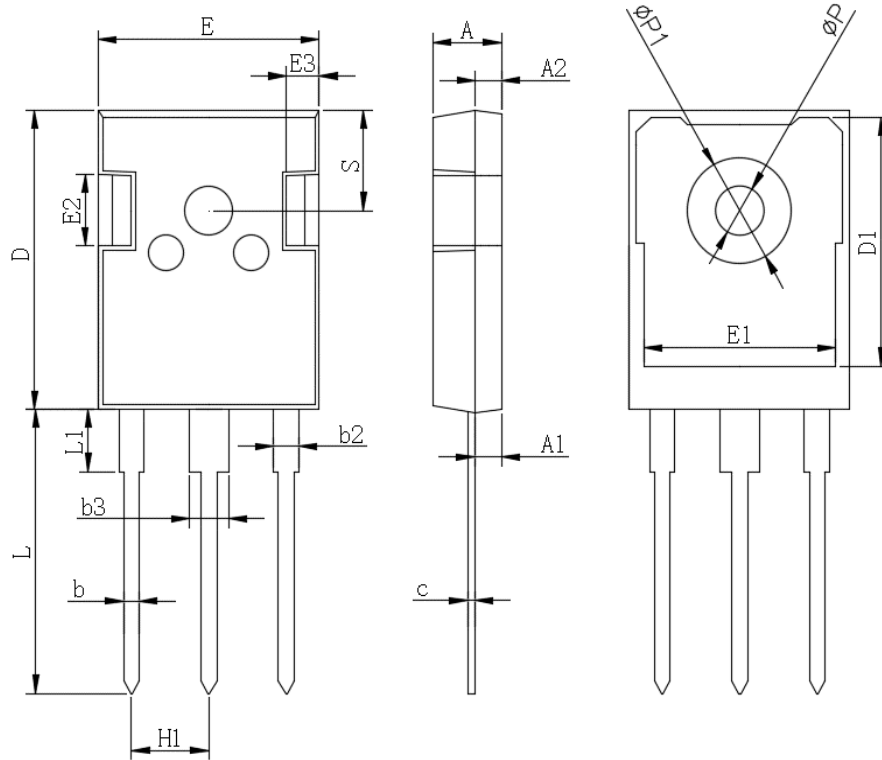


Figure D. Diode Recovery Test Circuit & Waveform

■ TO-247AB Package information

TO-247AB

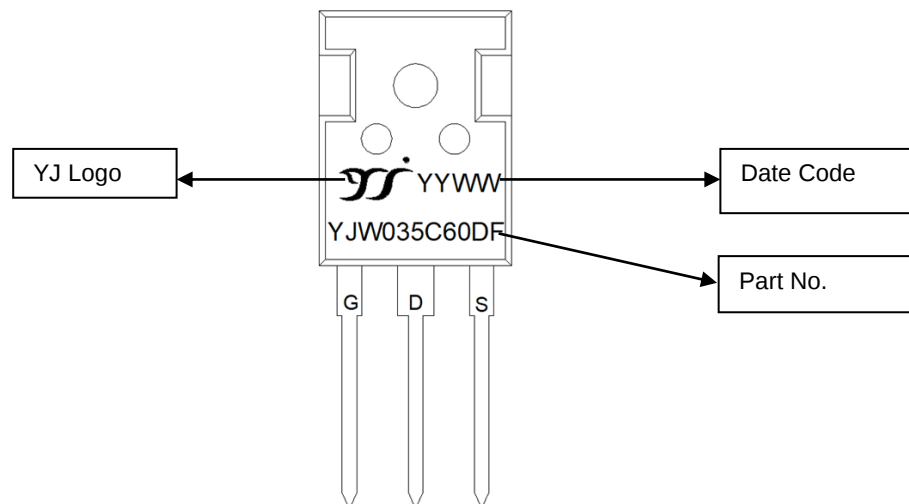


TO-247AB		
Dim	Min	Max
A	4.80	5.20
A1	2.21	2.61
A2	1.85	2.15
b	1.0	1.4
b2	1.91	2.21
c	0.5	0.7
D	20.70	21.30
D1	16.25	16.85
E	15.50	16.10
E1	13.0	13.6
E2	4.80	5.20
E3	2.30	2.70
L	19.62	20.22
L1	-	4.30
ΦP	3.40	3.80
ΦP1	-	7.30
S	6.15TYP	
H1	5.44TYP	
b3	2.80	3.20



YJW035C60DF

■ Marking Information



Note:

1. All marking is at middle of the product body
2. All marking is in laser printing
3. YJW035C60DF is marking code, YYWW is date code, "YY" is year, "WW" is week
4. Body color: Black



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