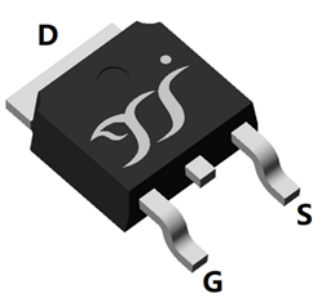
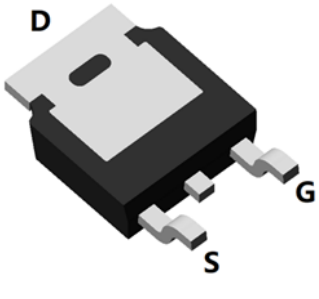
N-Channel Enhancement Mode Field Effect Transistor

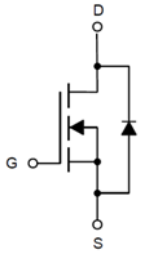


Top View



Bottom View

TO-252



Product Summary

- V_{DS} 635V
- I_D 7A
- $R_{DS(ON)}$(at V_{GS}=10V) ＜700mΩ
- 100% EAS Tested
- 100% ▽V_{DS} Tested

General Description

- Excellent package for heat dissipation
- High density cell design for low $R_{DS(ON)}$
- Moisture Sensitivity Level 1
- Epoxy Meets UL 94 V-0 Flammability Rating
- Halogen Free

Applications

- Power switching application
- Uninterruptible power supply
- DC-DC convertor

■ Limiting Values

Parameter	Conditions		Symbol	Min	Max	Unit
Drain-source Voltage			V_{DS}	-	635	V
Gate-source Voltage			V_{GS}	-30	30	
Continuous Drain Current (Note 1,2)	Steady-State	T_A=25℃,V_{GS}=10V	I_D	-	1.22	A
		T_A=100℃,V_{GS}=10V		-	0.77	
Continuous Drain Current (Note 1,3)	Steady-State	T_C=25℃,V_{GS}=10V		-	7	
		T_C =100℃,V_{GS}=10V		-	4.4	
Pulsed Drain Current	T_C=25℃,t_p≤10μs		I_{DM}	-	14	
Maximum Body-Diode Continuous Current	T_C=25℃		I_S		7	
Maximum Body-Diode Pulsed Current	T_C=25℃,t_p≤10μs		I_{SM}	-	14	
Avalanche Energy (non-repetitive)	T_J=25℃,V_G=10V,R_G=25Ω,L=5mH,IAS=1.1A		EAS	-	3	mJ
Total Power Dissipation (Note 1,2)	Steady-State	T_A=25℃	P_D	-	2.7	W
		T_A=100℃		-	1	
Total Power Dissipation (Note 1,3)	Steady-State	T_C=25℃		-	43	
		T_C =100℃		-	17	
MOSFET dv/dt Ruggedness	V_{DS}=0…300V,ID<=4A,Rg=0Ω		dv/dt	-	27.4	V/ns
Reverse Diode dv/dt	V_{DS}=0…300V,ID<=4A,di/dt=200A/us		dv/dt	-	6	
Maximum Diode Commutation Speed	V_{DS}=0…300V,ID<=4A,Rg=0Ω		dif/dt	-	860	A/us
Junction and Storage Temperature Range			T_J ,T_{STG}	-55	150	℃

■Thermal Resistance

Parameter		Symbol	Typ	Max	Units
Thermal Resistance Junction-to-Ambient (Note 2)	Steady-State	$R_{\theta JA}$	-	46	℃/W
Thermal Resistance Junction-to-Case	Steady-State	$R_{\theta JC}$	-	2.85	

■ Ordering Information (Example)

PREFERED P/N	PACKING CODE	Marking	MINIMUM PACKAGE(pcs)	INNER BOX QUANTITY(pcs)	OUTER CARTON QUANTITY(pcs)	DELIVERY MODE
YJD700C60BHJ	F2	YJD700C60B	2500	/	25000	13“ reel

■ Electrical Characteristics

Parameter	Symbol	Conditions	Min	Typ	Max	Units
Static Parameter						
Drain-Source Breakdown Voltage	BV_{DSS}	V_{GS}=0V,I_D=250μA,Tj=25℃	635	-	-	V
		V_{GS}=0V,I_D=1mA,Tj=25℃	635	-	-	V
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS}=635V,V_{GS}=0V,Tj=25℃	-	-	1	μA
		V_{DS}=635V,V_{GS}=0V,Tj=150℃	-	-	100	
Gate-Source Leakage Current	I_{GSS}	V_{GS}=±30V,V_{DS}=0V,Tj=25℃	-	-	±100	nA
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS}=V_{GS},I_D=250μA,Tj=25℃	2	2.8	3.6	V
Static Drain-Source On-Resistance	$R_{DS(ON)}$	V_{GS}=10V,I_D=4.5A,Tj=25℃	-	590	700	mΩ
		V_{GS}=10V,I_D=4.5A,Tj=150℃	-	1537	1823	mΩ
Diode Forward Voltage	V_{SD}	I_S=4.5A,V_{GS}=0V,Tj=25℃	-	0.86	1.2	V
Gate Resistance	R_G	f=1MHz,Tj=25℃	-	100	-	Ω
Dynamic Parameters						
Input Capacitance	C_{iss}	V_{DS}=300V,V_{GS}=0V,f=1MHz,Tj=25℃	-	347	-	pF
Output Capacitance	C_{oss}		-	10.3	-	
Reverse Transfer Capacitance	C_{rss}		-	2.3	-	
Effective output capacitance, energy related	$C_{o(er)}$	V_{DS}=0…300V,V_{GS}=0V,f=1MHz, Tj=25℃	-	19.5	-	
Effective output capacitance, time related	$C_{o(tr)}$		-	111.3	-	
Switching Parameters						
Total Gate Charge	Q_g	V_{GS}=10V,V_{DS}=300V,I_D=4.5A,Tj=25℃	-	9.3	-	nC
Gate-Source Charge	Q_{gs}		-	1.6	-	
Gate-Drain Charge	Q_{gd}		-	5	-	
Reverse Recovery Charge	Q_{rr}	I_F=4.5A,di/dt=100A/μs,V_{GS}=0V, V_R=300V,Tj=25℃	-	1024	-	nC
Reverse Recovery Time	t_{rr}		-	135	-	ns
Peak Reverse Recovery Current	I_{rrm}		-	13.8	-	A
Turn-on Delay Time	$t_{D(on)}$	V_{GS}=10V,V_{DS}=300V,I_D=4.5A,R_{GEN}=3Ω, Tj=25℃	-	42	-	ns
Turn-on Rise Time	t_r		-	24	-	
Turn-off Delay Time	$t_{D(off)}$		-	89	-	
Turn-off Fall Time	t_f		-	27	-	

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 with the device mounted on the 40mm*40mm*1.1mm single layer FR-4 PCB board with 1 in^2 pad of 2oz. Copper, in the still air environment with T_A=25℃.The maximum allowed junction temperature of 150℃. The value in any given application depends on the user's specific board design.
3. Thermal resistance from junction to soldering point (on the exposed drain pad).

■Typical Electrical and Thermal Characteristics Diagrams

错误!链接无效。 错误!链接无效。

Figure 1. Output Characteristics; typical values

Figure 2. Transfer Characteristics; typical values

错误!链接无效。 错误!链接无效。

Figure 3. Capacitance Characteristics; typical values

Figure 4. Gate Charge; typical values

错误!链接无效。 错误!链接无效。

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

Figure 6. Normalized On-Resistance

错误!链接无效。 错误!链接无效。

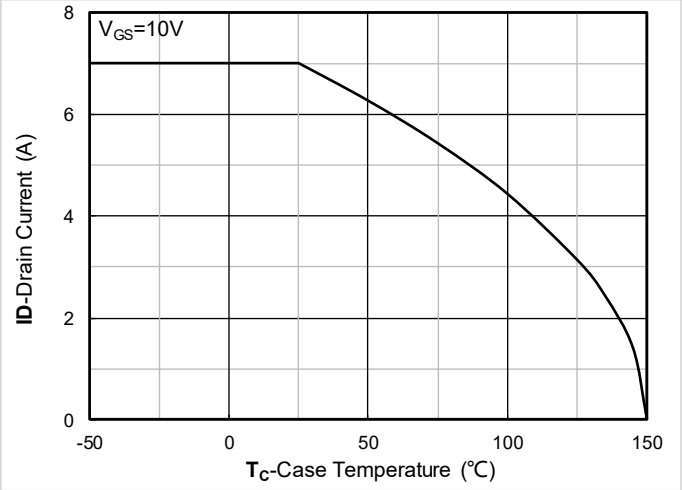
Figure 7. $R_{DS(on)}$ vs. Drain Current; typical values

Figure 8. Forward characteristics of reverse diode; typical values

错误!链接无效。 错误!链接无效。

Figure 9. Normalized breakdown voltage

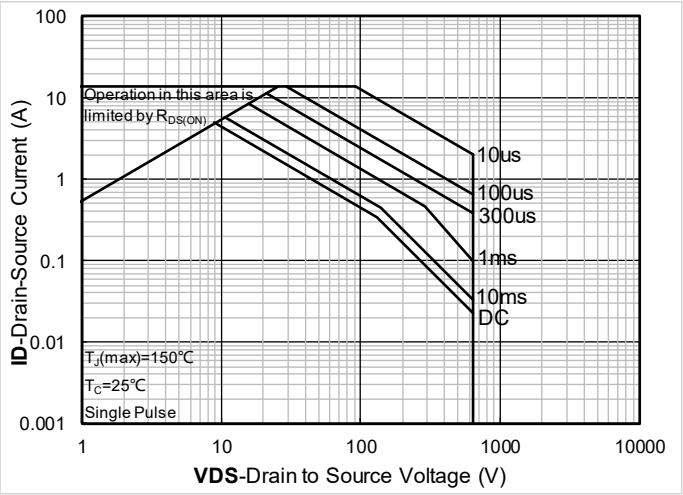
Figure 10. Normalized Threshold voltage



错误!链接无效。

Figure 11. Current dissipation

Figure 12. Power dissipation



错误!链接无效。

Figure 13. Maximum Transient Thermal Impedance

Figure 14. Safe Operation Area

■ Test Circuits & Waveforms

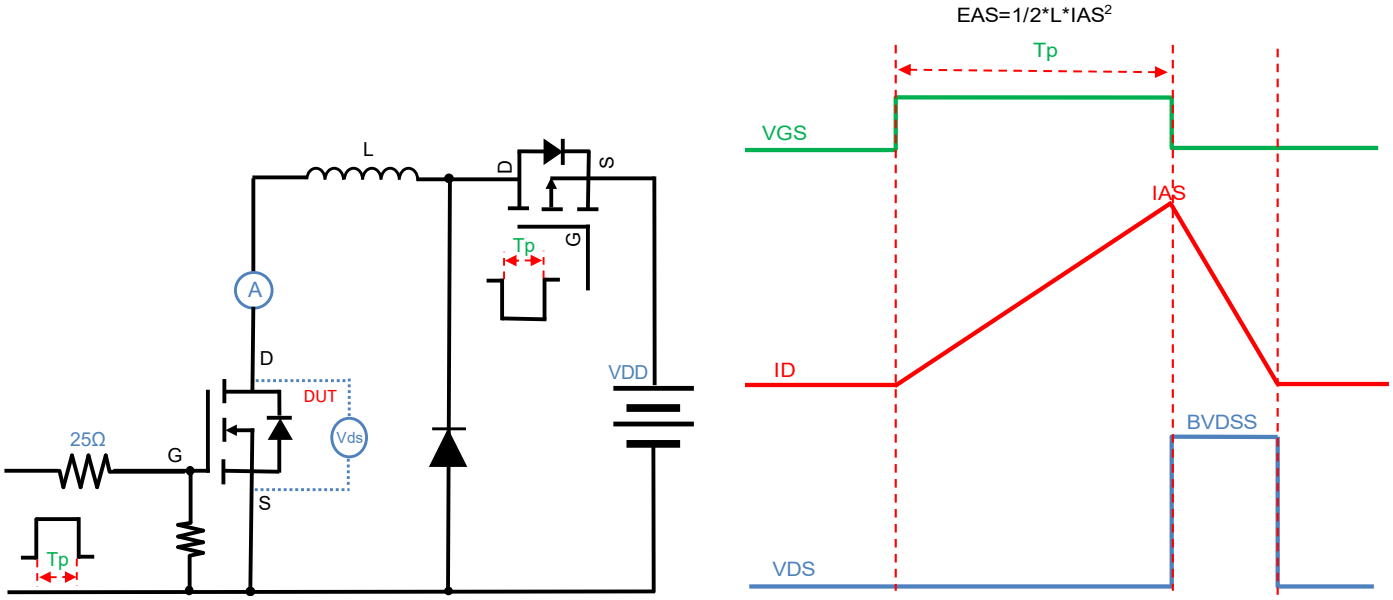


Figure A. Unclamped Inductive Switching (UIS) Test Circuit & Waveform

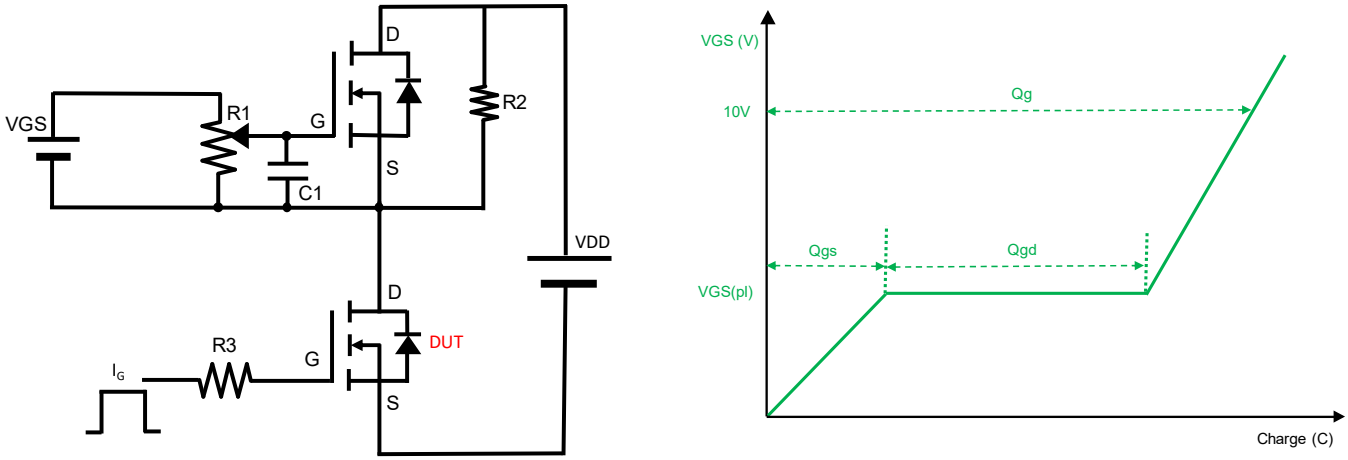


Figure B. Gate Charge Test Circuit & Waveform

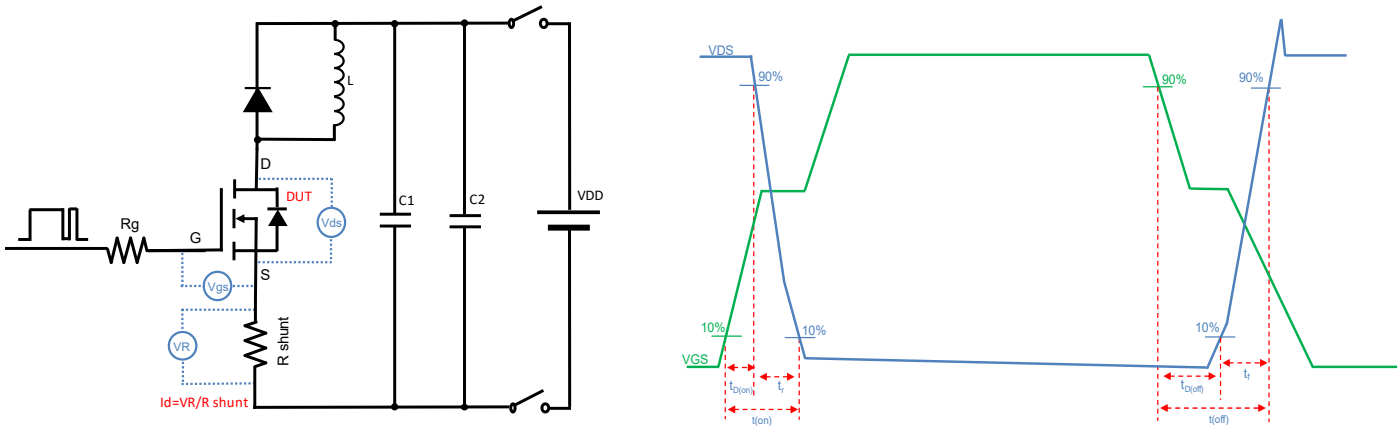


Figure C. Resistive Switching Test Circuit & Waveform

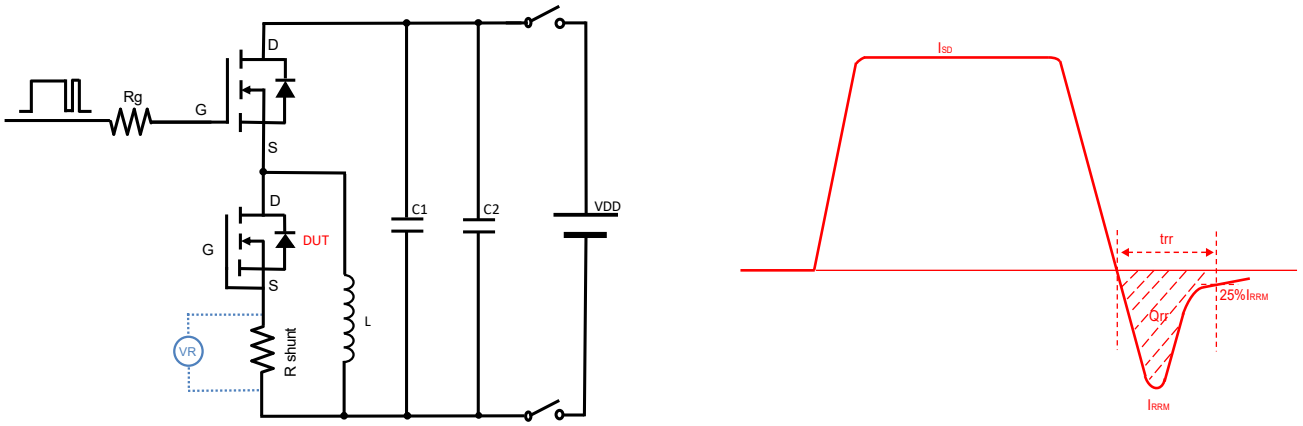
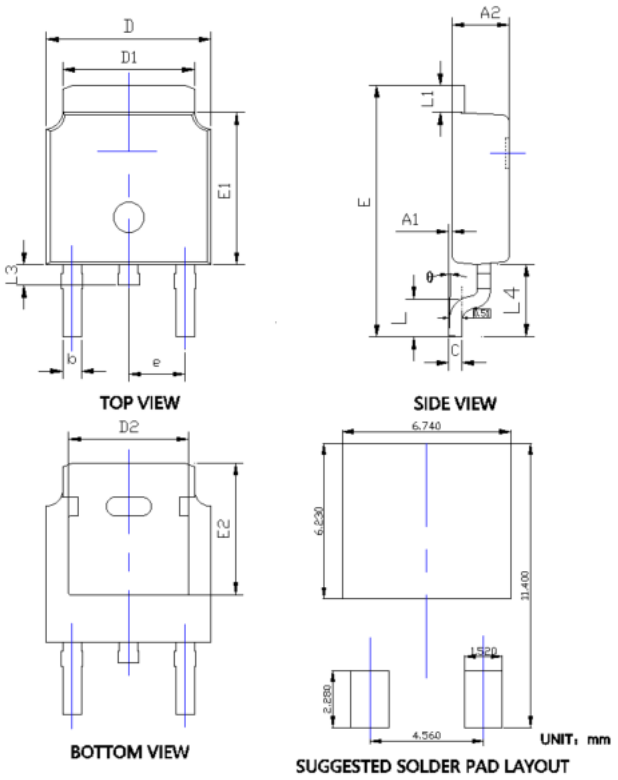


Figure D. Diode Recovery Test Circuit & Waveform

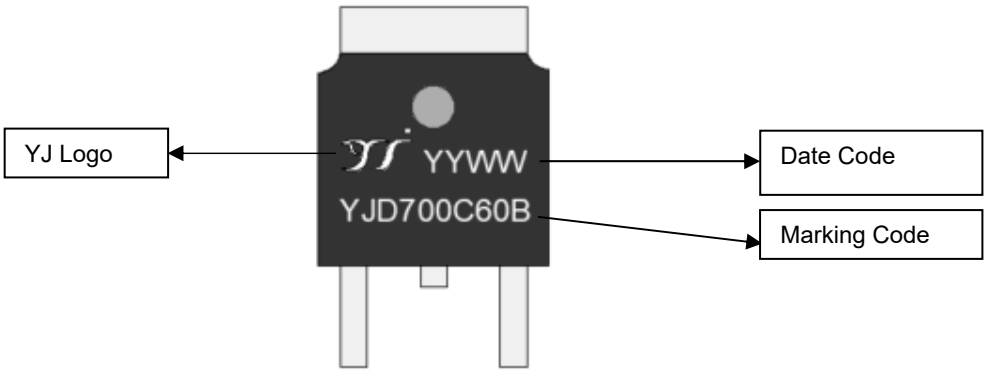
■ TO-252-C Package information



DIMENSIONS				
SYMBOL	INCHES		Millimeter	
	MIN.	MAX.	MIN.	MAX.
A1	0.000	0.008	0.000	0.200
A2	0.086	0.094	2.180	2.400
b	0.026	0.035	0.660	0.890
c	0.018	0.024	0.460	0.610
D	0.250	0.265	6.350	6.730
D1	0.195	0.215	4.950	5.460
D2	0.170	-	4.320	-
E	0.370	0.410	9.400	10.410
E1	0.235	0.245	5.970	6.220
E2	0.203	-	5.150	-
e	0.090 REF		2.286 REF	
L	0.049	0.070	1.250	1.780
L1	0.035	0.050	0.890	1.270
L3	0.024	0.039	0.600	1.000
L4	0.102	0.126	2.600	3.200
θ	0°	10°	0°	10°

NOTE:
1.PACKAGE BODY SIZES EXCLUDE MOLD FLASH AND GATE BURRS.
2.TOLERANCE 0.1mm UNLESS OTHERWISE SPECIFIED.
3.THE PAD LAYOUT IS FOR REFERENCE PURPOSES ONLY.

■ Marking Information



Note：
1. All marking is at middle of the product body
2. All marking is in laser printing
3. YJD700C60B is marking code,
YYWW is date code, “YY” is year, “WW” is week
4. Body color: Black

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 with 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.

REV.	EFFECTIVE DATE	REVISION HISTORY	PREPARED
1.0	2025.4.1	New Release	Haijun Ding