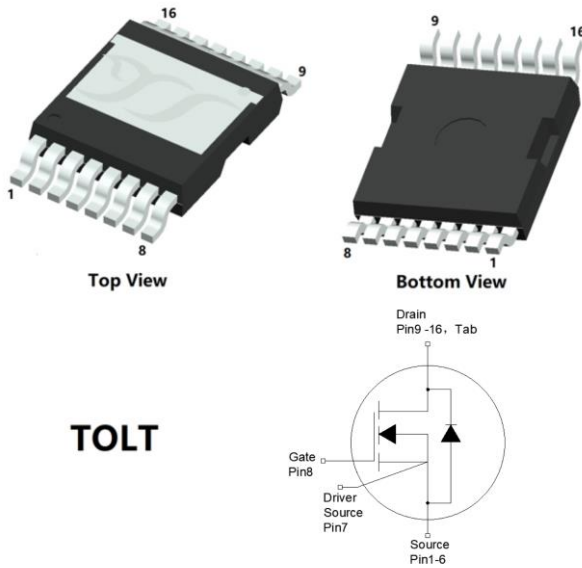




N-Channel Enhancement Mode Field Effect Transistor



TOLT

Product Summary

• V_{DS}	80V
• I_D	453A
• $R_{DS(ON)}$ (at $V_{GS}=10V$)	$<1.13m\Omega$
• 100% EAS Tested	
• 100% ∇V_{DS} Tested	
• ESD Level(HBM)	Class 3B

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

- BLDC Motor driver
- Load Switch
- DC-DC convertor
- 48V Port

■ Limiting Values

Parameter	Conditions		Symbol	Min	Max	Unit	
Drain-source Voltage			V _{DS}	-	80	V	
Gate-source Voltage			V _{GS}	-20	20		
Continuous Drain Current (Note 1,2)	Steady-State	T _A =25°C,V _{GS} =10V	I _D	-	42.1	A	
		T _A =100°C,V _{GS} =10V		-	29.8		
Continuous Drain Current (Note 1,3)	Steady-State	T _C =25°C,V _{GS} =10V,Chip limitation		-	453		
		T _C =100°C,V _{GS} =10V		-	320		
Pulsed Drain Current	T _C =25 °C,t _p ≤10μs			I _{DM}	-		1812
Maximum Body-Diode Continuous Current	T _C =25 °C			I _S			360
Avalanche Energy (non-repetitive)	T _J =25°C,V _G =10V, R _G =25Ω, L=1mH, I _{AS} =56A		EAS	-	1568	mJ	
Total Power Dissipation (Note 1,2)	Steady-State	T _A =25°C	P _D	-	4	W	
		T _A =100°C		-	2		
Total Power Dissipation (Note 1,3)	Steady-State	T _C =25°C		-	468		
		T _C =100°C		-	234		
Junction and Storage Temperature Range			T _J ,T _{STG}	-55	175	°C	

■ Thermal Resistance

Parameter		Symbol	Typ	Max	Units
Thermal Resistance Junction-to-Ambient (Note 2)	Steady-State	$R_{\theta JA}$	-	37	$^{\circ}C/W$
Thermal Resistance Junction-to-Case	Steady-State	$R_{\theta JC}$	-	0.32	

■ Ordering Information (Example)

PREFERRED P/N	PACKING CODE	Marking	MINIMUM PACKAGE(pcs)	INNER BOX QUANTITY(pcs)	OUTER CARTON QUANTITY(pcs)	DELIVERY MODE
YJTL1D1G08H	F1	YJTL1D1G08H	1200	1200	6000	13" reel



YJTL1D1G08H

■ 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℃	80	-	-	V
Zero Gate Voltage Drain Current	I _{DSS}	V _{DS} =80V, V _{GS} =0V, T _j =25℃	-	-	1	μA
		V _{DS} =80V, V _{GS} =0V, T _j =125℃	-	-	100	
Gate-Source Leakage Current	I _{GSS}	V _{GS} =±20V, V _{DS} =0V, T _j =25℃	-	-	±100	nA
Gate Threshold Voltage	V _{GS(th)}	V _{DS} =V _{GS} , I _D =250μA, T _j =25℃	2.2	3	3.8	V
Static Drain-Source On-Resistance	R _{DS(ON)}	V _{GS} =10V, I _D =50A, T _j =25℃	-	0.86	1.13	mΩ
Diode Forward Voltage	V _{SD}	I _S =50A, V _{GS} =0V, T _j =25℃	-	0.78	1.2	V
Gate Resistance	R _G	f=1MHz, T _j =25℃	-	3.2	-	Ω
Dynamic Parameters						
Input Capacitance	C _{iss}	V _{DS} =40V, V _{GS} =0V, f=1MHz, T _j =25℃	-	12790	-	pF
Output Capacitance	C _{oss}		-	3130	-	
Reverse Transfer Capacitance	C _{rss}		-	106	-	
Switching Parameters						
Total Gate Charge	Q _g	V _{GS} =10V, V _{DS} =40V, I _D =50A, T _j =25℃	-	219	-	nC
Gate-Source Charge	Q _{gs}		-	55	-	
Gate-Drain Charge	Q _{gd}		-	69	-	
Reverse Recovery Charge	Q _{rr}	I _F =50A, di/dt=100A/μs, V _{GS} =0V, V _R =40V, T _j =25℃	-	158	-	nC
Reverse Recovery Time	t _{rr}		-	84	-	ns
Turn-on Delay Time	t _{D(on)}	V _{GS} =10V, V _{DS} =40V, I _D =50A, R _{GEN} =3Ω, T _j =25℃	-	23.5	-	ns
Turn-on Rise Time	t _r		-	152	-	
Turn-off Delay Time	t _{D(off)}		-	110	-	
Turn-off Fall Time	t _f		-	120	-	

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 in² pad of 2oz. Copper, in the still air environment with $T_A=25^{\circ}C$. The maximum allowed junction temperature of $175^{\circ}C$. 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

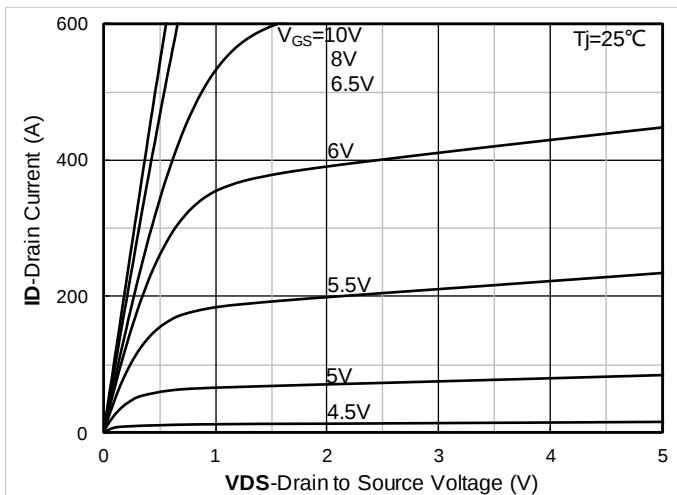


Figure 1. Output Characteristics; typical values

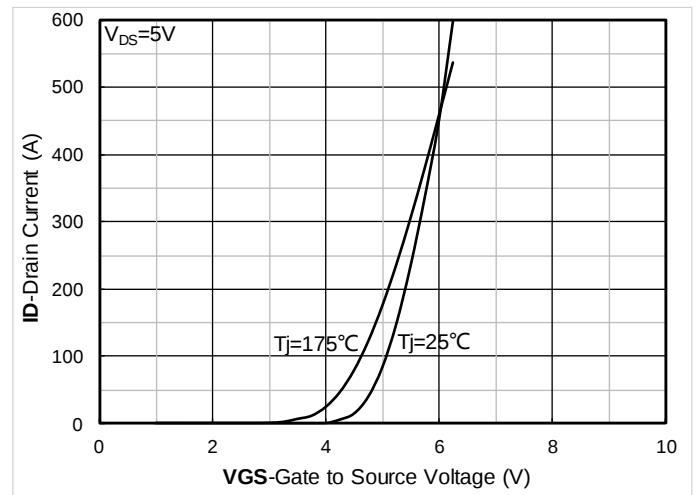


Figure 2. Transfer Characteristics; typical values

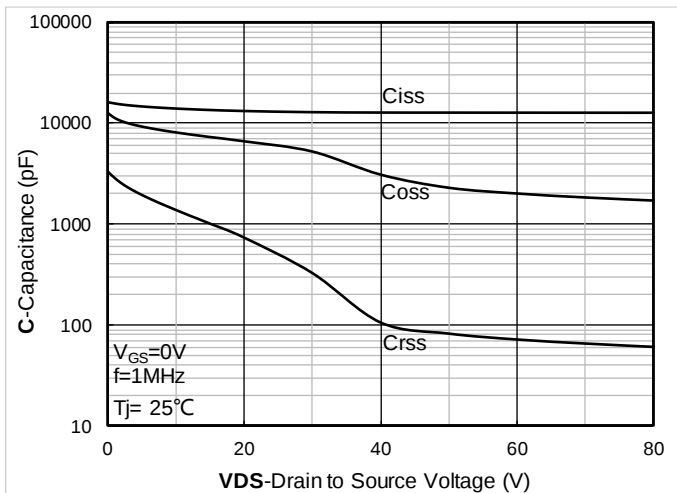


Figure 3. Capacitance Characteristics; typical values

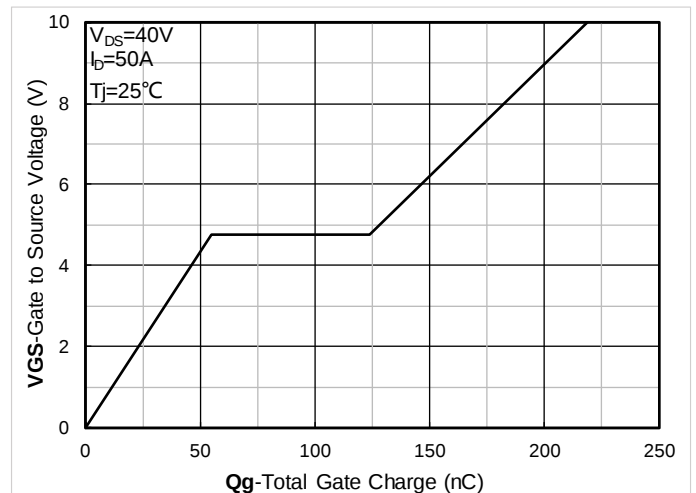


Figure 4. Gate Charge; typical values

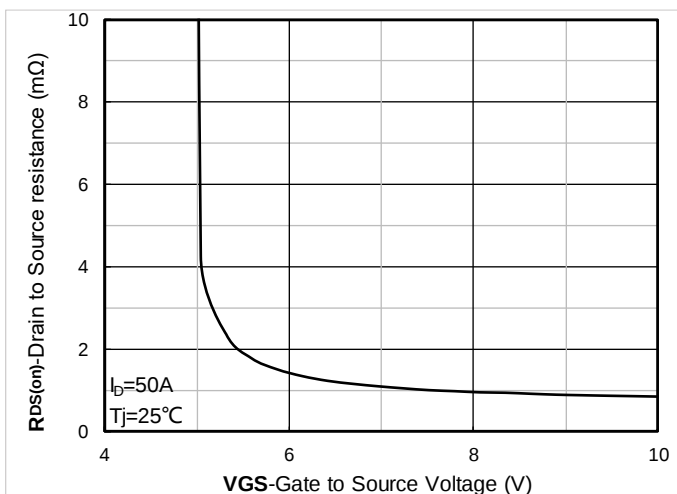


Figure 5. On-Resistance vs. Gate to Source Voltage; typical values

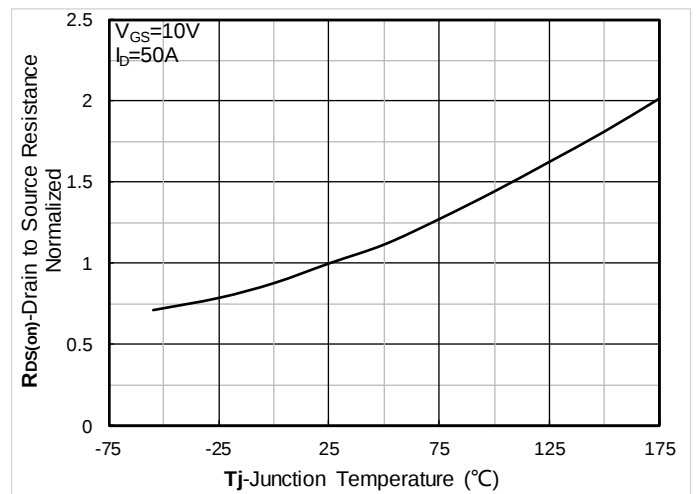


Figure 6. Normalized On-Resistance

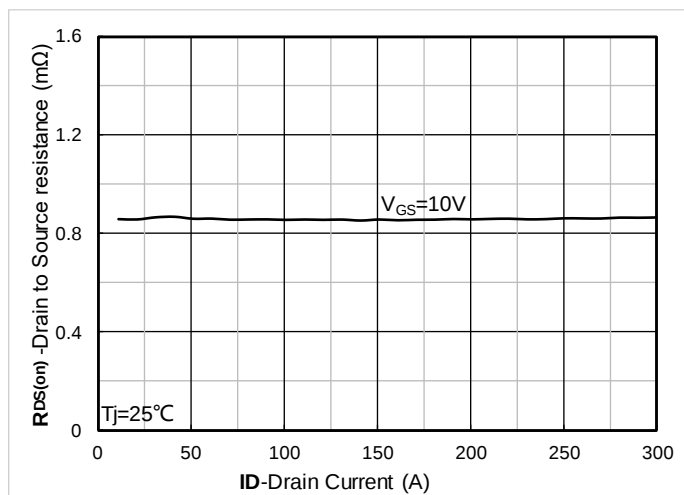


Figure 7. $R_{DS(on)}$ vs. Drain Current; typical values

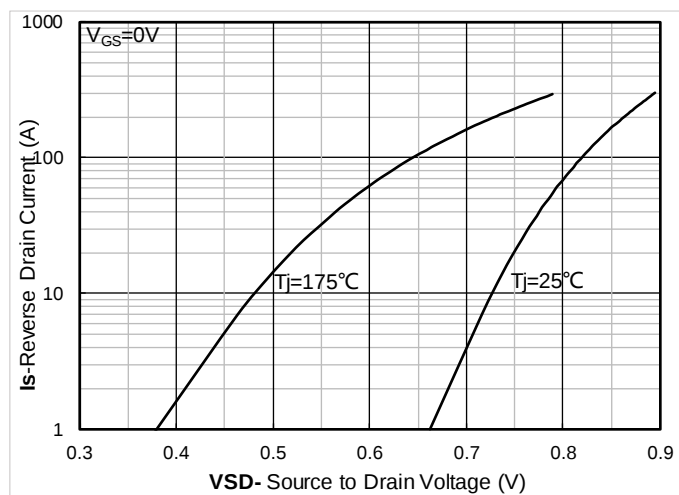


Figure 8. Forward characteristics of reverse diode; typical values

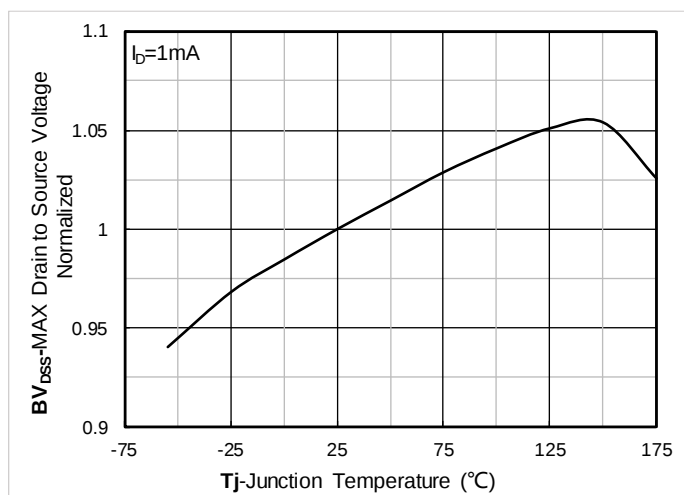


Figure 9. Normalized breakdown voltage

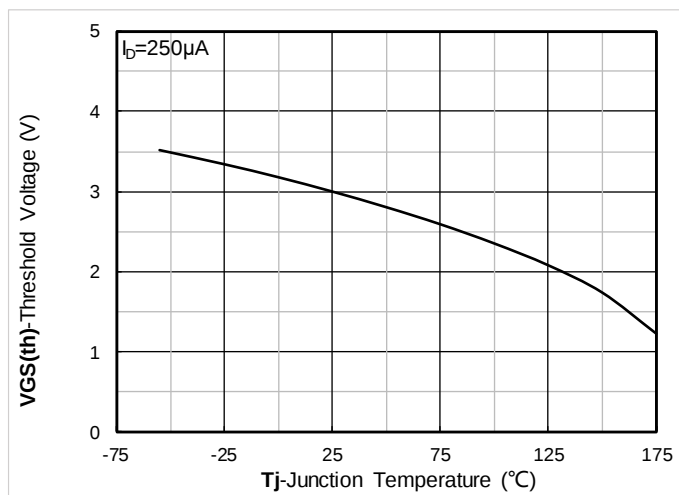


Figure 10. Gate Threshold voltage; typical values

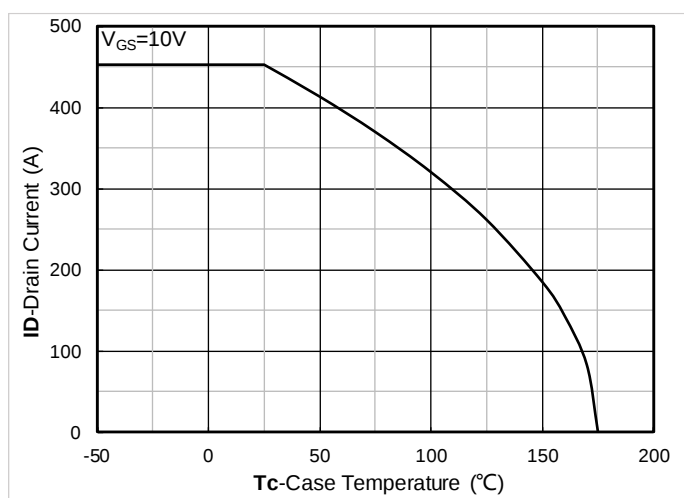


Figure 11. Current dissipation

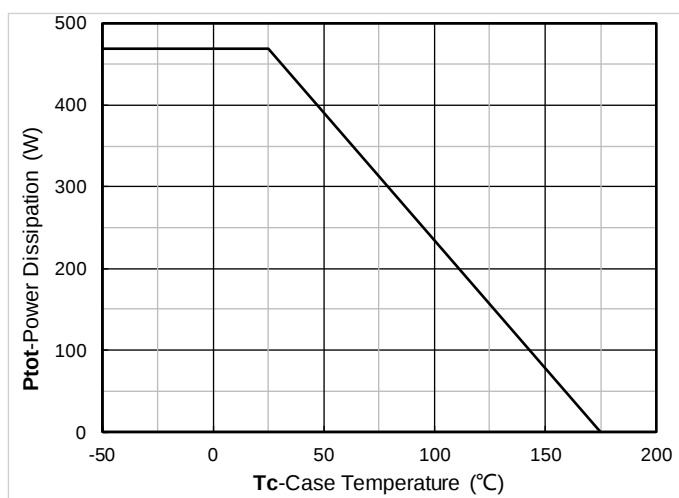


Figure 12. Power dissipation

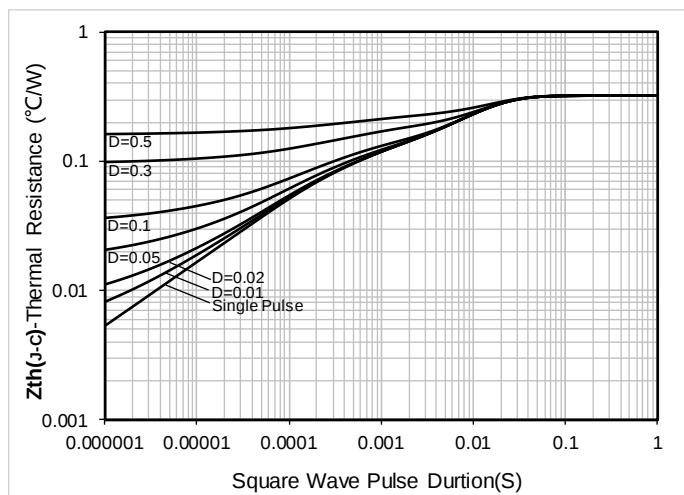


Figure 13. Maximum Transient Thermal Impedance

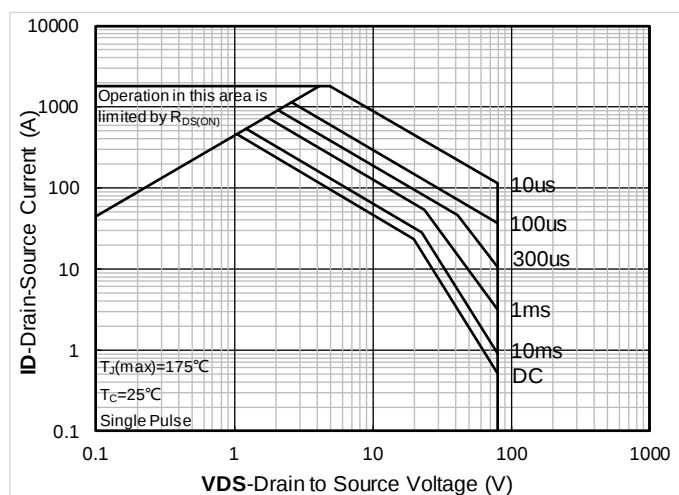


Figure 14. Safe Operation Area

■ Test Circuits & Waveforms

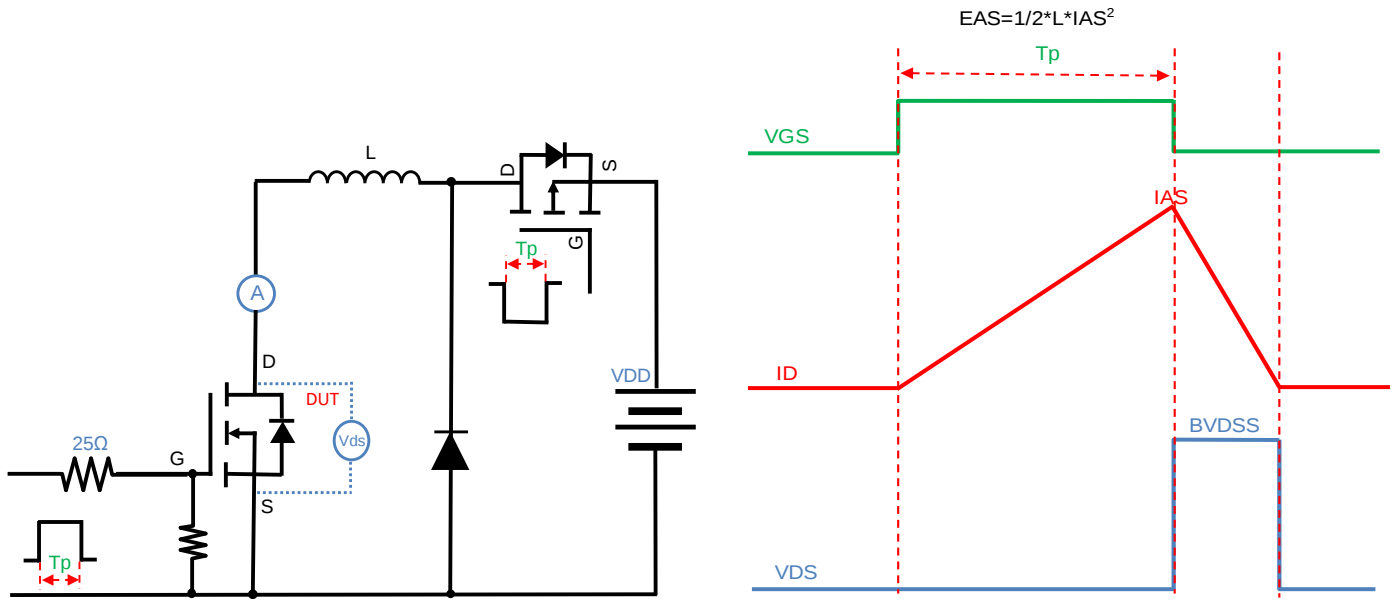


Figure A. Unclamped Inductive Switching (UIS) Test Circuit & Waveform

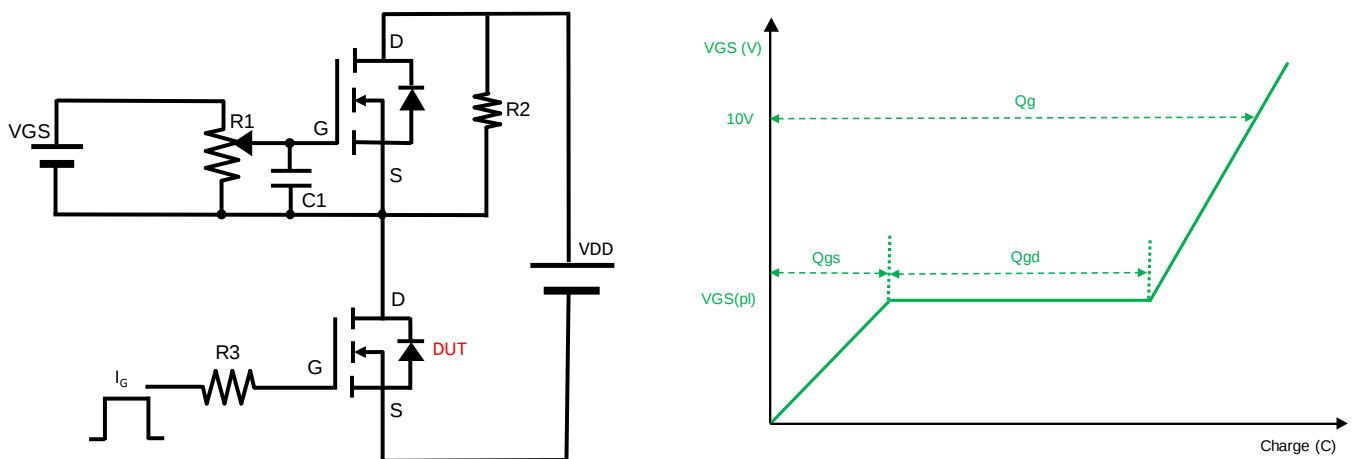


Figure B. Gate Charge Test Circuit & Waveform

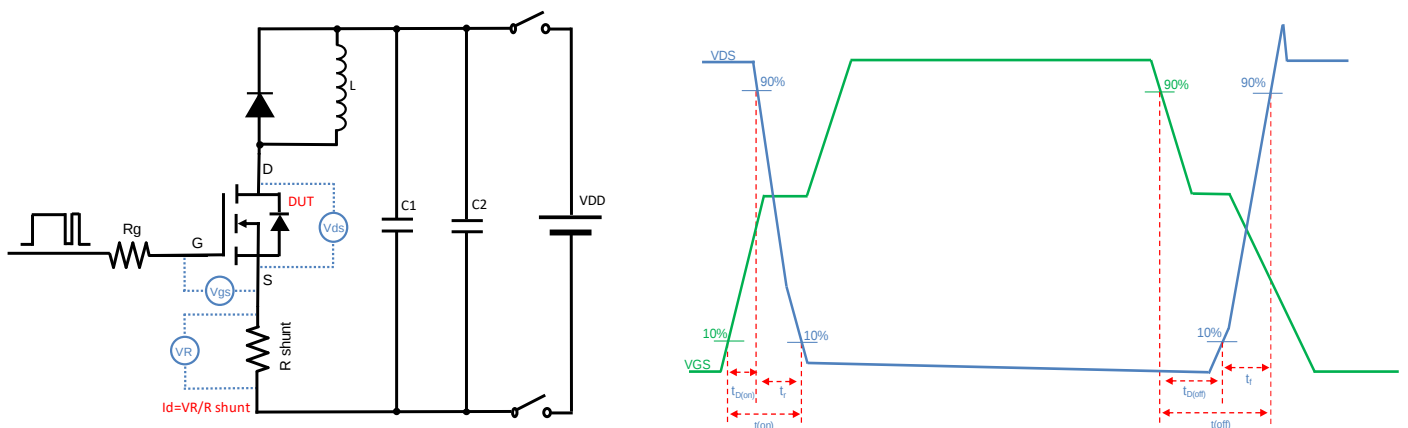


Figure C. Resistive Switching Test Circuit & Waveform

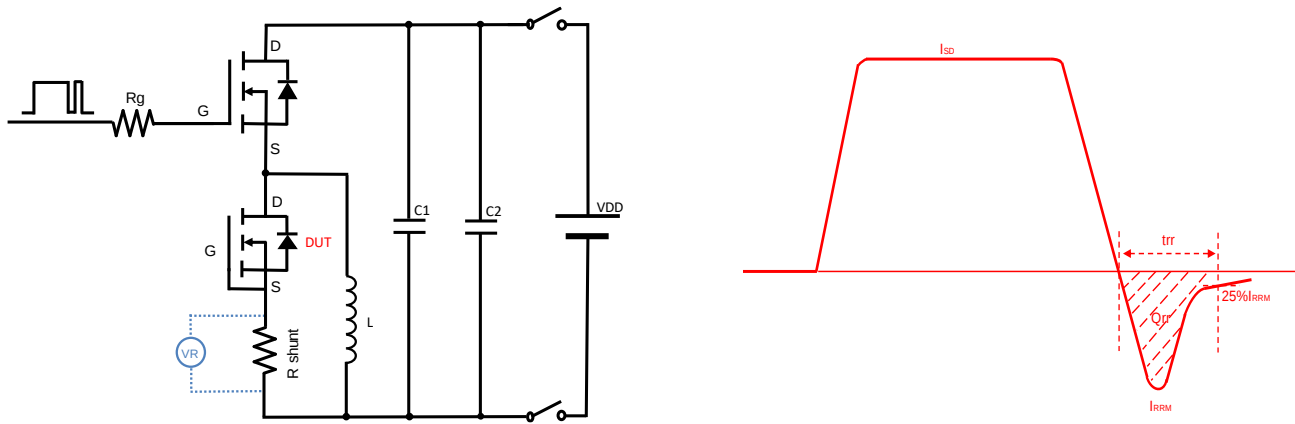
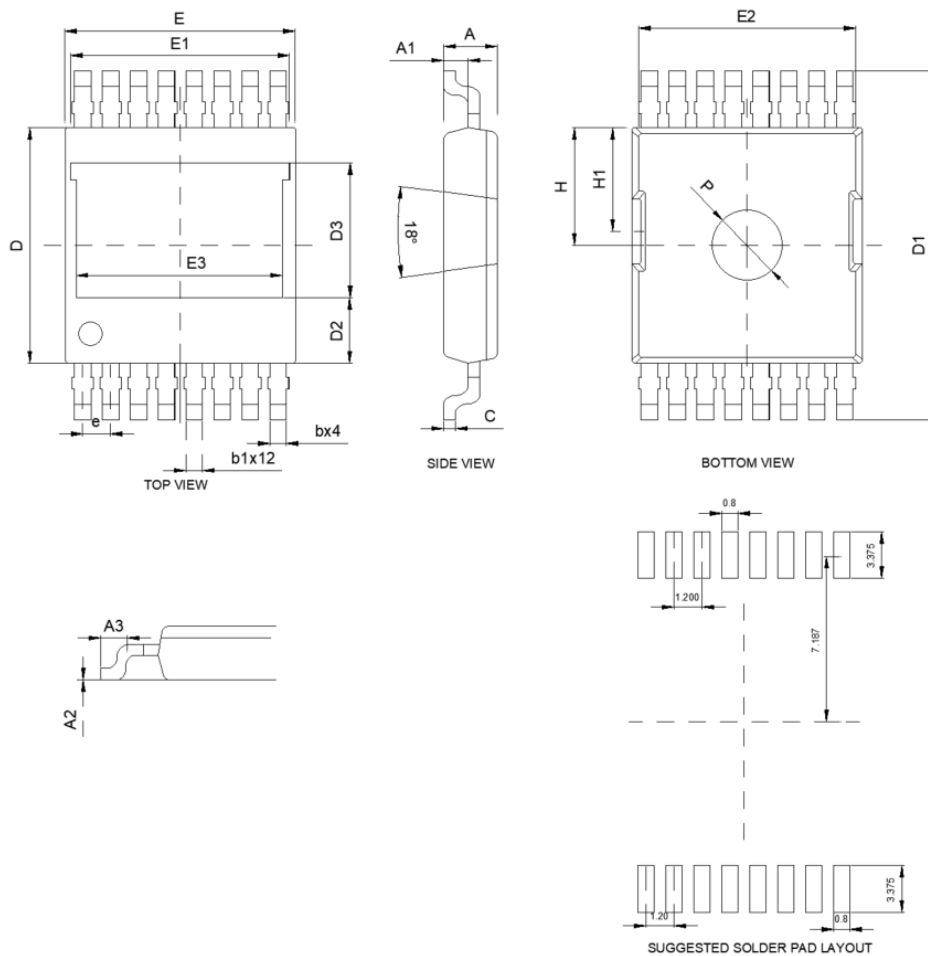


Figure D. Diode Recovery Test Circuit & Waveform



YJTL1D1G08H

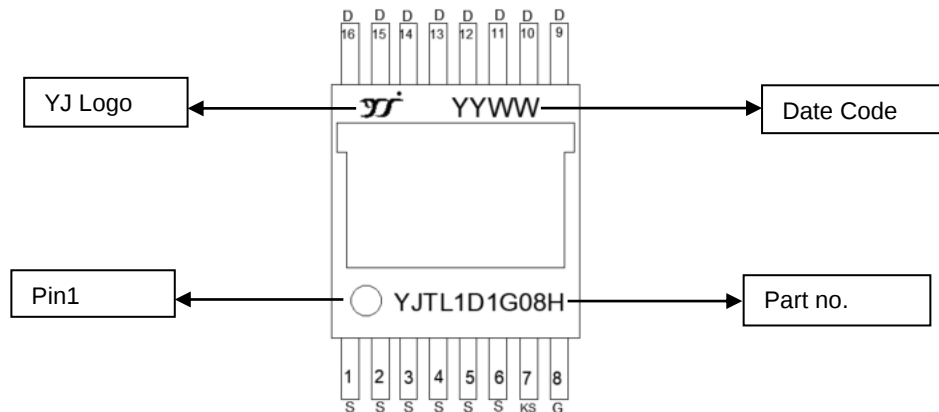
TOLT Package Information



DIMENSIONS			
SYMBOL	Millimeter		
	MIN	NOM	MAX
A	2.25	2.30	2.35
A1	1.00	1.04	1.08
A2	0.01	0.08	0.16
A3	1.50REF		
b	0.70	0.75	0.80
b1	0.60	0.70	0.80
c	0.40	0.50	0.60
D	10.00	10.10	10.30
D1	14.80	15.00	15.20
D2	2.60	2.80	3.00
D3	5.77REF		
E	9.70	9.90	10.10
E1	9.46REF		
E2	9.25REF		
E3	8.70REF		
e	1.18	1.20	1.22
H	5.00	5.20	5.40
H1	4.40	4.60	4.80
L	2.40	2.45	2.50
P	2.80	3.00	3.20

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. YJTL1D1G08H is part no., YYWW is date code, "YY" is year, "WW" is week
4. Body color: Black



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