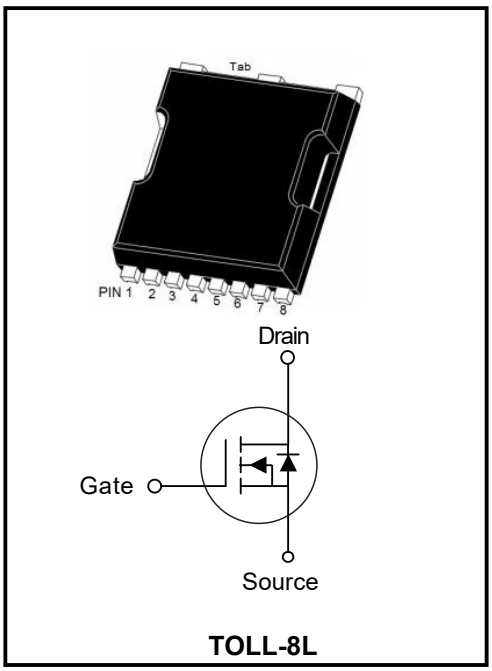
100V N-CHANNEL ENHANCEMENT MODE MOSFET

MAIN CHARACTERISTICS

I_D	290A
V_{DSS}	100V
R_{DSON}-typ(@V_{GS}=10V)	＜2.0mΩ(Typ:1.6mΩ)



TOLL-8L

FEATURES

- Fast Switching
- Low On-Resistance (RDS(on)≤2.0mΩ)
- Low Gate Charge
- Low Reverse transfer capacitances
- High avalanche ruggedness
- RoHS product
- **YFW-SGT technology**

APPLICATIONS

- Switching applications
- Motor drivers
- BMS
- Synchronous rectification

ABSOLUTE MAXIMUM RATINGS (T_C = 25°C unless otherwise noted)

Characteristics	Symbols	Value	Units
Drain-Source Voltage	V_{DS}	100	V
Gate - Source Voltage	V_{GS}	±20	V
Continuous Drain Current, Silicon Limited	I_D	318	A
Continuous Drain Current, Package Limited		290	A
Continuous Drain Current @T_C=100°C, Silicon Limited		235	A
Pulsed Drain Current Note1	I_{DM}	1160	A
Power Dissipation	P_D	365	W
Derating Factor above 25°C		2.43	W/°C
Avalanche Energy Note2	E_{AS}	1722	mJ
Operation and storage temperature	T_{STG}, T_J	-55 to +175	°C
Maximum Temperature for Soldering	T_L	260	℃
Thermal Resistance, Junction-case	$R_{\theta JC}$	0.41	°C/W
Thermal Resistance, Junction-ambient4)	$R_{\theta JA}$	40	°C/W

Note1： Repetitive Rating： Pulse width limited by maximum junction temperature
Note2： L=0.5mH, Ias=83A Start T_J=25℃

Electrical Characteristics at T_C=25°C, unless otherwise specified

Characteristics	Test Condition	Symbols	Min	Typ	Max	Units
Drain-Source Breakdown Voltage	V_{GS}=0V, I_D=250uA	BV_{DSS}	100	-	-	V
Gate -Threshold Voltage	V_{DS}=V_{GS}, I_D=250μA	$V_{GS(th)}$	2	3.0	4.0	V
Drain-source on-state resistance	V_{GS}=10V, I_D=80A	$R_{DS(ON)}$	-	1.6	2.0	mΩ
Gate-Source Forward Leakage	V_{GS}=±20V	$I_{GSS(F)}$	-	-	100	nA
Gate-Source Reverse Leakage	V_{GS}=-20V	$I_{GSS(R)}$	-	-	-100	nA
Drain-Source Leakage Current	V_{DS}=100V , V_{GS}=0V	I_{DSS}	-	-	1	μA
	V_{DS} =80, V_{GS} =0V@T_C=125°C		-	-	100	μA
Input Capacitance	V_{GS}=0V V_{DS}=50V f=1MHz	C_{iss}	-	11726	-	pF
Output Capacitance		C_{oss}		3586	-	
Reverse Transfer Capacitance		C_{rss}	-	481	-	
Turn-on delay time	V_{DD}=50V, I_D=80A, V_{GS}=10V, R_G=3Ω, Resistive Load	$t_{d(on)}$	-	38	-	ns
Rise Time		T_r	-	110	-	
Turn-Off Delay Time		$t_{d(OFF)}$	-	91	-	
Fall Time		t_f	-	121	-	
Total Gate Charge	I_D=80A V_{DD}=50V V_{GS}=10V	Q_g	-	202	-	nC
Gate-Source Charge		Q_{gs}	-	55	-	
Gate-Drain Charge		Q_{gd}	-	60	-	
Continuous Source Current	T_C=25°C (Package limit)	I_S	-	-	290	A
Maximum Pulsed Current	T_C=25°C,tplimited by Tjmax	I_{SM}	-	-	1160	A
Diode Forward Voltage	V_{GS}=0V, I_S=80A	V_{SD}	-	-	1.1	V
Reverse Recovery Time	I_f=80A,V_{GS}=0, di/dt=100A/us	t_{rr}	-	112	-	ns
Reverse Recovery Charge		Q_{rr}	-	332	-	nC

Characteristics Curves

Figure 1. Safe Operating Area

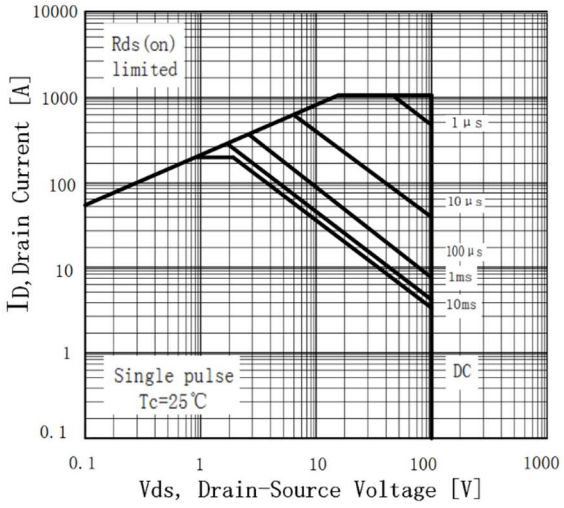


Figure 2. Maximum Power Dissipation vs Case Temperature

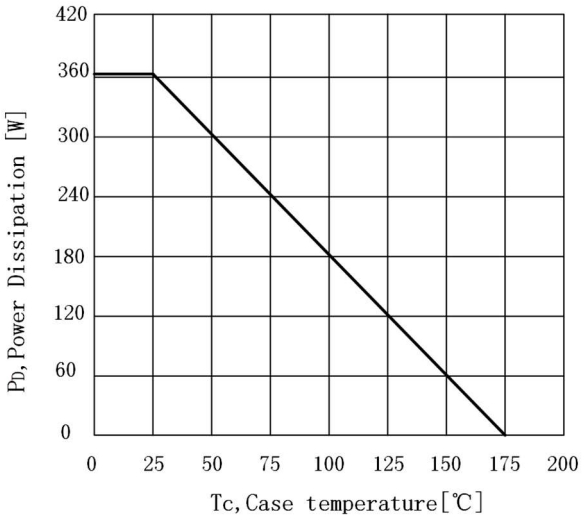


Figure 3. Maximum Continuous Drain Current vs Case Temperature

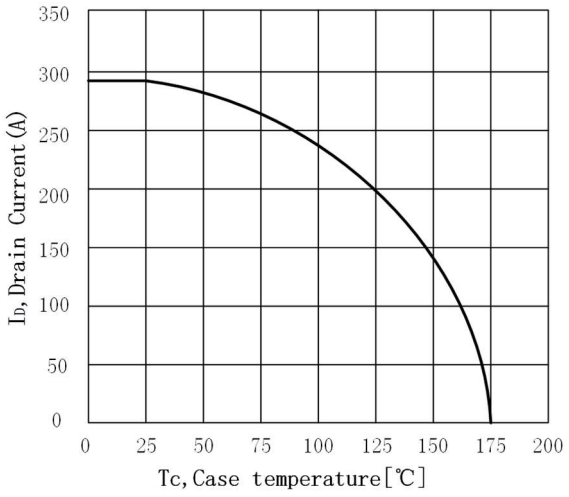
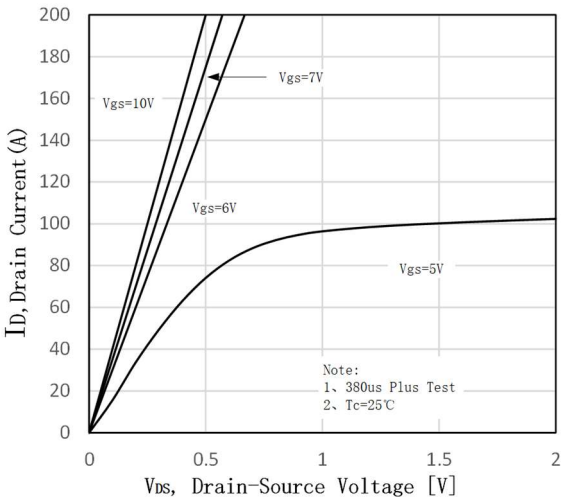


Figure 4. Typical Output Characteristics



Characteristics Curves

Figure 5. Transient Thermal Impedance

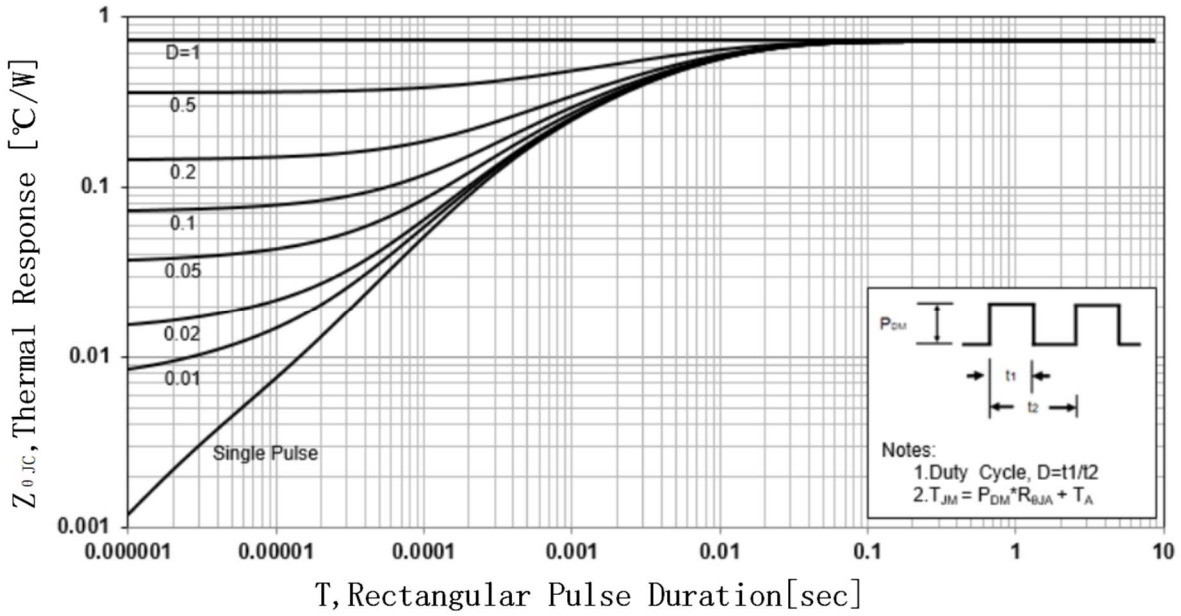


Figure 6. Typical Transfer Characteristics

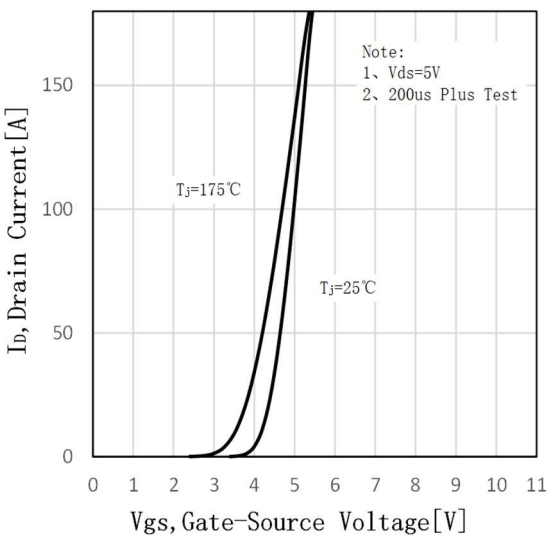
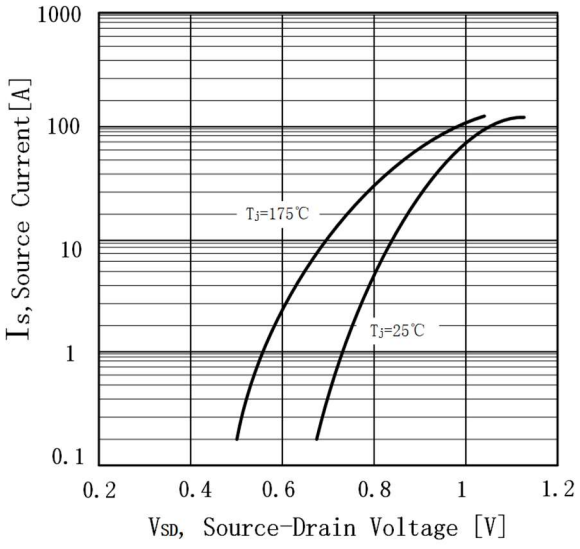


Figure 7. Source-Drain Diode Forward Characteristics



Characteristics Curves

Figure 8. Drain-Source On-Resistance vs Drain Current

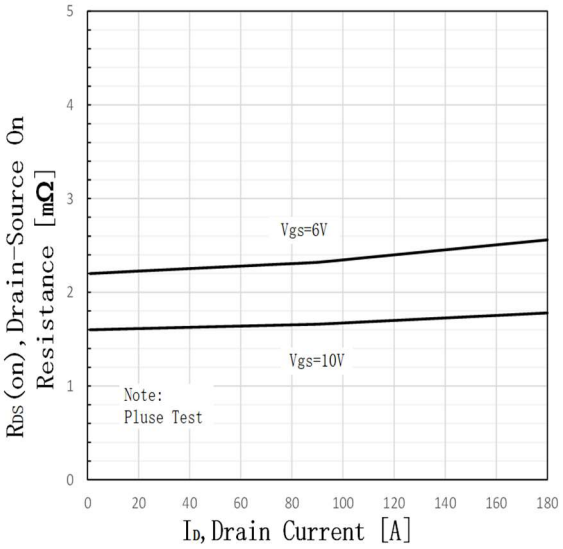


Figure 9. Normalized On-Resistance vs Junction Temperature

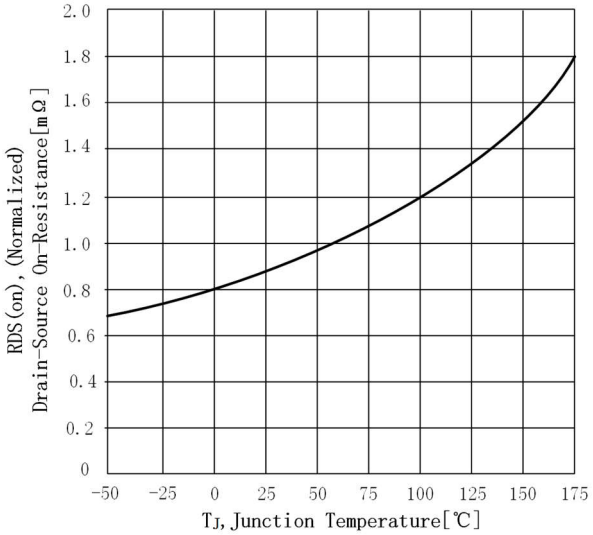


Figure 10. Normalized Threshold Voltage vs Junction Temperature

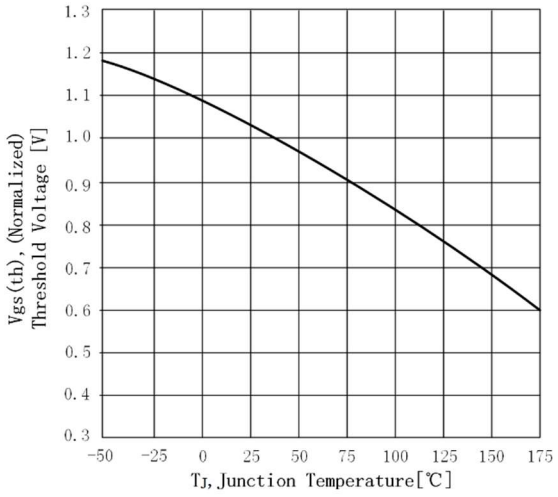


Figure 11. Normalized Breakdown Voltage vs Junction Temperature

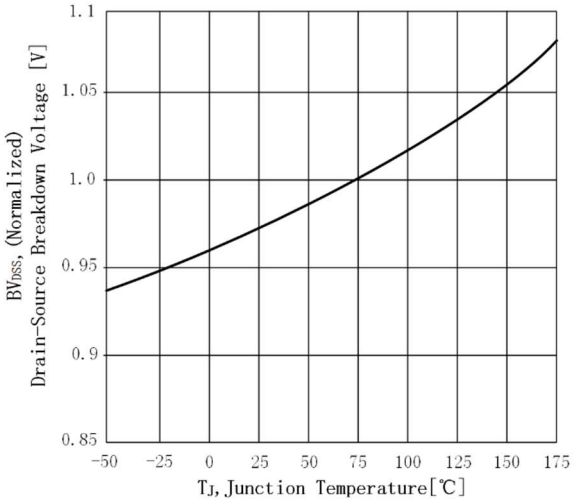


Figure 12. Capacitance Characteristics

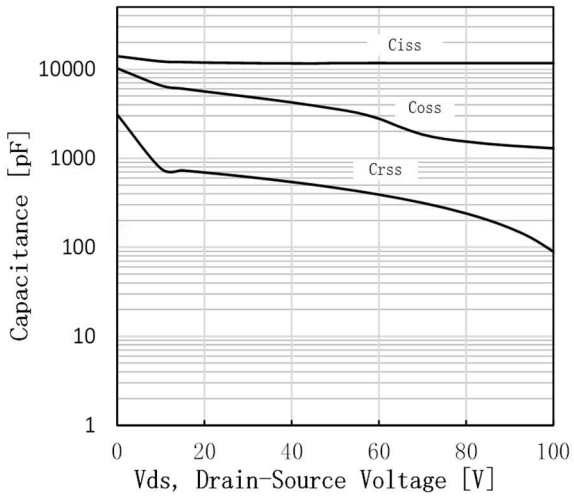
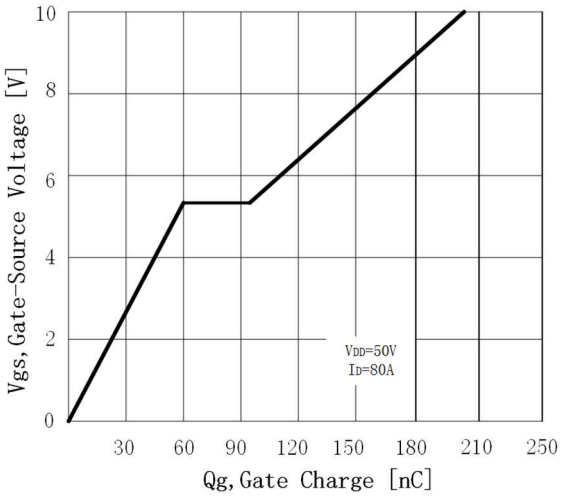


Figure 13. Typical Gate Charge vs Gate-Source Voltage



Test Circuit and Waveform

Figure 14. Resistive Switching Test Circuit

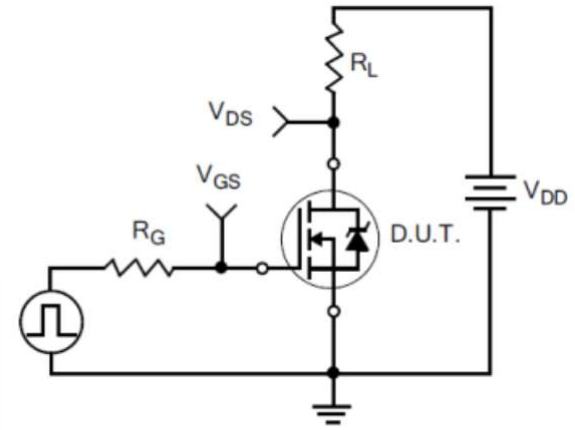


Figure 15. Resistive Switching Waveforms

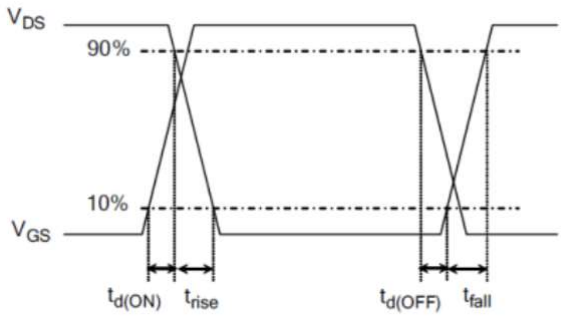


Figure 16. Gate Charge Test Circuit

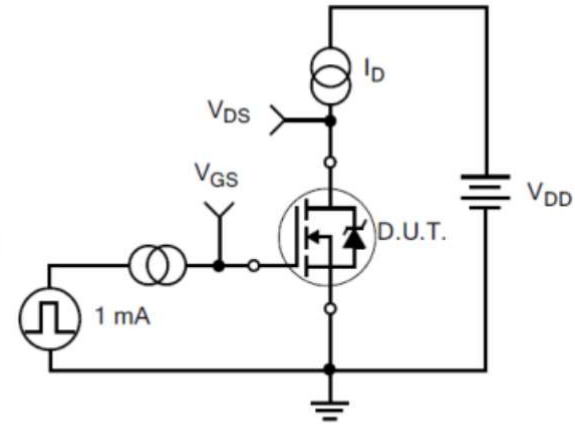
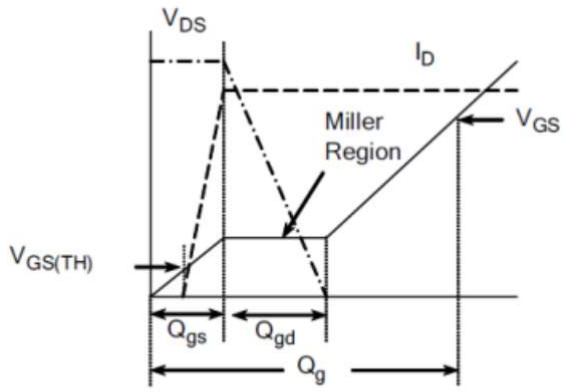


Figure 17. Gate Charge Waveforms



Test Circuit and Waveform

Figure 18. Diode Reverse Recovery Test Circuit

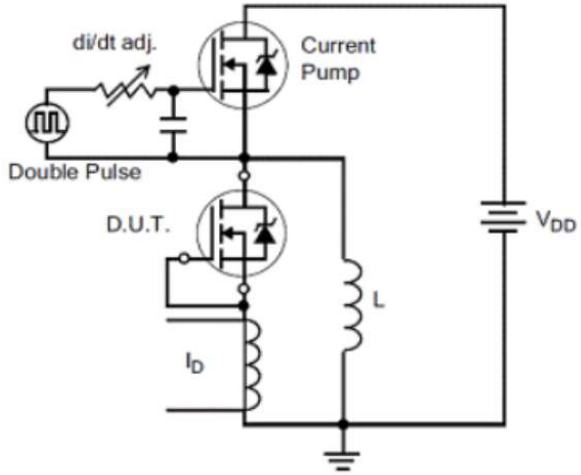


Figure 19. Diode Reverse Recovery Waveform

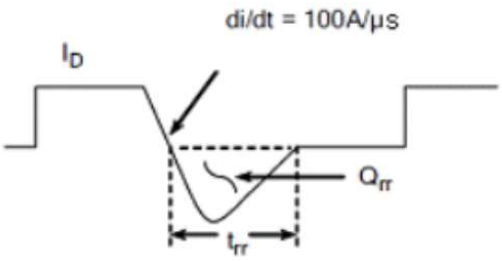


Figure 20. Unclamped Inductive Switching Test Circuit

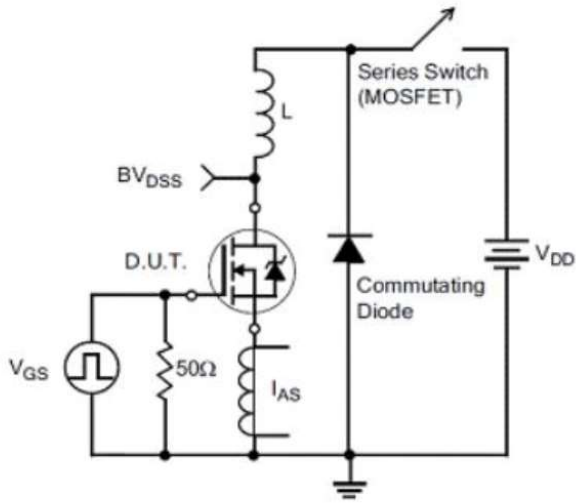
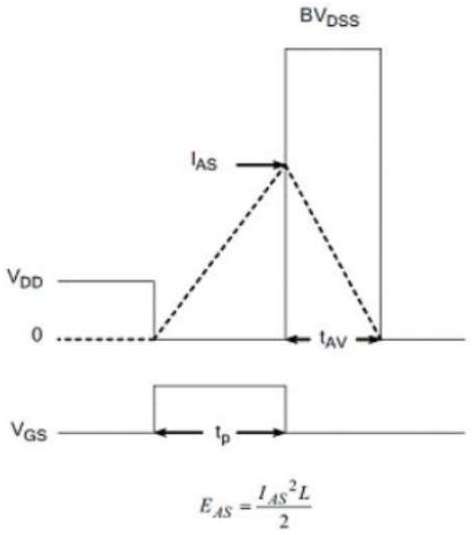
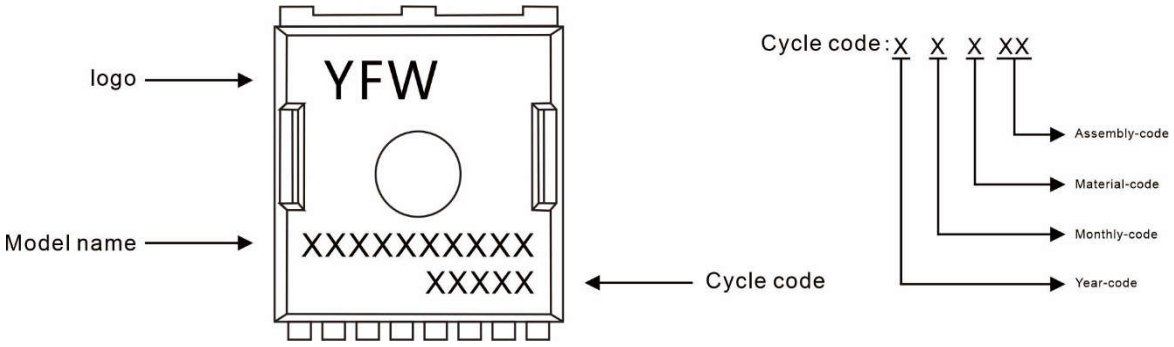


Figure 21. Unclamped Inductive Switching Waveform



Marking Diagram

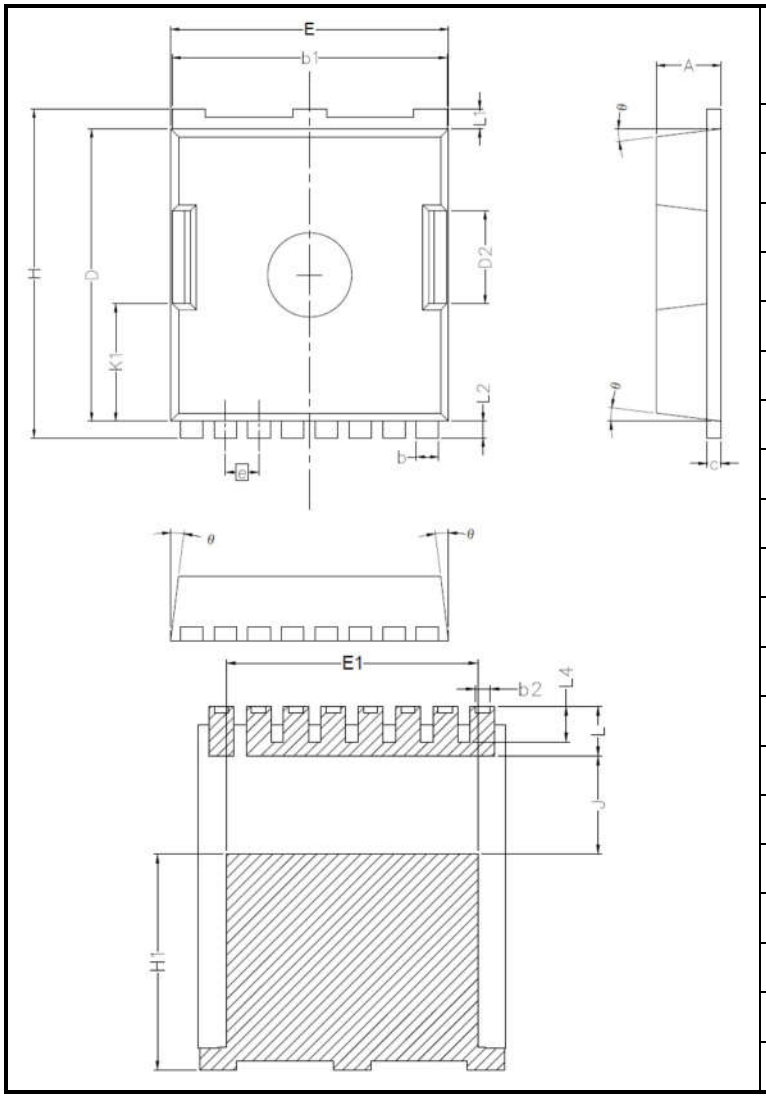


Ordering information

Model name	Package	Unit Weight	Base Quantity	Packing Quantity
YFWG290N10TL	TOLL-8L	-	2000pcs/reel	4000pcs/box 20000pcs/Carton

Package Dimensions

TOLL-8L



Dim	Millimeter		Inches	
	Min.	Max.	Min.	Max.
A	2.20	2.40	0.087	0.095
b	0.70	0.90	0.028	0.035
b1	9.70	9.90	0.382	0.390
b2	0.42	0.50	0.017	0.020
c	0.40	0.60	0.016	0.024
D	10.28	10.58	0.405	0.417
D2	3.10	3.50	0.122	0.138
E	9.70	10.10	0.382	0.398
E1	7.90	8.30	0.311	0.327
e	1.20BSC		0.047BSC	
H	11.48	11.88	0.452	0.468
H1	6.75	7.15	0.266	0.281
N	8		0.315	
J	3.00	3.30	0.118	0.130
K1	3.98	4.38	0.157	0.172
L	1.40	1.80	0.055	0.071
L1	0.60	0.80	0.024	0.032
L2	0.50	0.70	0.020	0.028
L4	1.00	1.30	0.04	0.051
θ	4°	10°	4°	10°

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