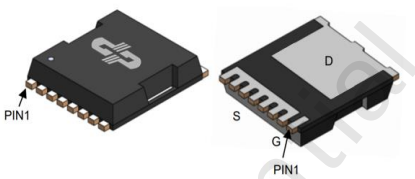
DP030N10TGN

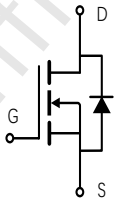
DPMOS N-MOSFET 100V, 1.9mΩ, 254A

Product Summary

Part #	V_{DS}	$R_{DS(on).typ}$	I_D
DP030N10TGN	100V	1.9mΩ	254A

TOLL





Features

- Uses advanced MOSFET-DPMOS2 technology
- Extremely low on-resistance $R_{DS(on)}$
- Excellent $Q_g x R_{DS(on)}$ product(FOM)
- Qualified according to JEDEC criteria

Applications

- Motor control and drive
- Battery management
- UPS (Uninterrupible Power Supplies)

MSL 1

100% Avalanche Tested

100% Rg Tested

Package Marking and Ordering Information

Part #	Marking	Package	Packing
DP030N10TGN	030N10TGN	TOLL	Tape/Reel

Halogen-Free

Absolute Maximum Ratings

Parameter	Symbol	Value	Unit
Drain-source voltage	V_{DS}	100	V
Continuous drain current T_C = 25°C T_C = 100°C	I_D	 254 161	A
Pulsed drain current (T_C = 25°C, t_p limited by T_{jmax})	$I_{D\ pulse}$	1016	A
Avalanche energy, single pulse (L=0.5mH, Rg=25Ω)[1]	E_{AS}	1122	mJ
Gate-Source voltage	V_{GS}	±20	V
Power dissipation (T_C = 25°C)	P_{tot}	250	W
Operating junction and storage temperature	T_j , T_{stg}	-55...+150	°C

[1].EAS is tested at starting Tj = 25℃, VGS = 10V.

Thermal Resistance

Parameter	Symbol	Max	Unit
Thermal resistance, junction – case.	R_{thJC}	0.5	°C/W
Thermal resistance, junction – ambient(min. footprint)	R_{thJA}	46	

Electrical Characteristic (at Tj = 25 °C, unless otherwise specified)

Parameter	Symbol	Value			Unit	Test Condition
		min.	typ.	max.		
Static Characteristic						
Drain-source breakdown voltage	BV_{DSS}	100	-	-	V	V_{GS}=0V, I_D=250uA
Gate threshold voltage	$V_{GS(th)}$	2	-	4	V	V_{DS}=V_{GS},I_D=250uA
Zero gate voltage drain current	I_{DSS}	- -	- -	1 100	μA	V_{DS}=100V,V_{GS}=0V T_j=25°C T_j=125°C
Gate-source leakage current	I_{GSS}	-	-	±100	nA	V_{GS}=±20V,V_{DS}=0V
Drain-source on-state resistance	$R_{DS(on)}$	- -	- 1.9	- 2.3	mΩ	T_j=25°C V_{GS}=10V, I_D=20A
Gate resistance	R_g	-	1.3	3	Ω	V_{GS}=0V, V_{DS}=0V, f=1MHz
Transconductance[2]	g_{fs}	-	100	-	S	V_{DS}=5V,I_D=20A
Dynamic Characteristic[2]						
Input Capacitance	C_{iss}	-	6915	-	pF	V_{GS}=0V, V_{DS}=50V, f=1MHz
Output Capacitance	C_{oss}	-	1595	-		
Reverse Transfer Capacitance	C_{rss}	-	5.2	-		
Gate Total Charge	Q_g	-	100	-	nC	V_{GS}=10V, V_{DS}=50V, I_D=20A, f=1MHz
Gate-Source charge	Q_{gs}	-	24	-		
Gate-Drain charge	Q_{gd}	-	21	-		
Turn-on delay time	$t_{d(on)}$	-	26	-	ns	V_{GS}=10V, V_{DD}=50V, R_{G_ext}=2.5Ω
Rise time	t_r	-	42	-		
Turn-off delay time	$t_{d(off)}$	-	85	-		
Fall time	t_f	-	69	-		

Body Diode Characteristic

Parameter	Symbol	Value			Unit	Test Condition
		min.	typ.	max.		
Body Diode Forward Voltage	V_{SD}	-	0.8	1.2	V	V_{GS}=0V,I_{SD}=20A
Diode continuous forward current	I_s	-	-	254	A	TC = 25°C
Diode pluse current	$I_{s\ pluse}$	-	-	1016	A	TC = 25°C
Body Diode Reverse Recovery Time[2]	t_{rr}	-	76	-	ns	I_F=20A, dI/dt=100A/μs
Body Diode Reverse Recovery Charge[2]	Q_{rr}	-	95	-	nC	

[2]. Defined by design. Not subject to production test

Typical Performance Characteristics

Fig 1: Output Characteristics

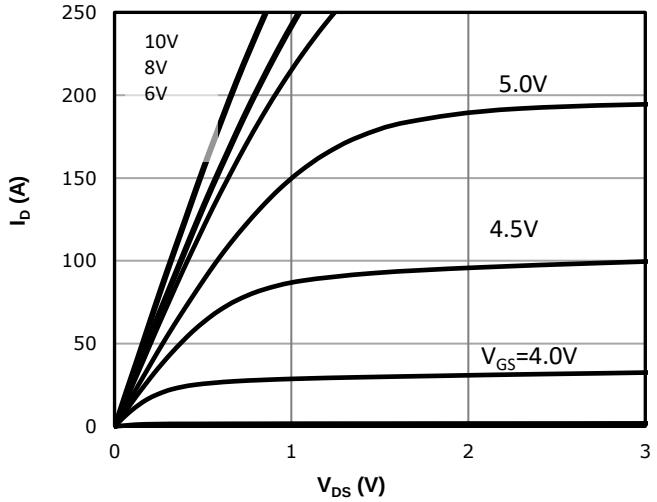


Fig 2: Transfer Characteristics

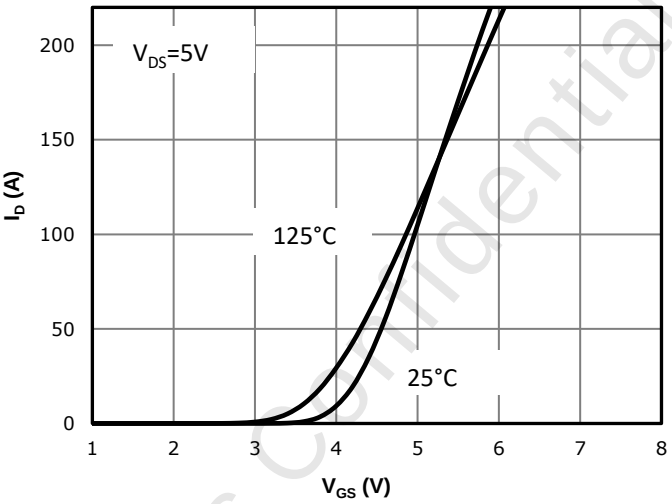


Fig 3: Rds(on) vs Drain Current and Gate Voltage

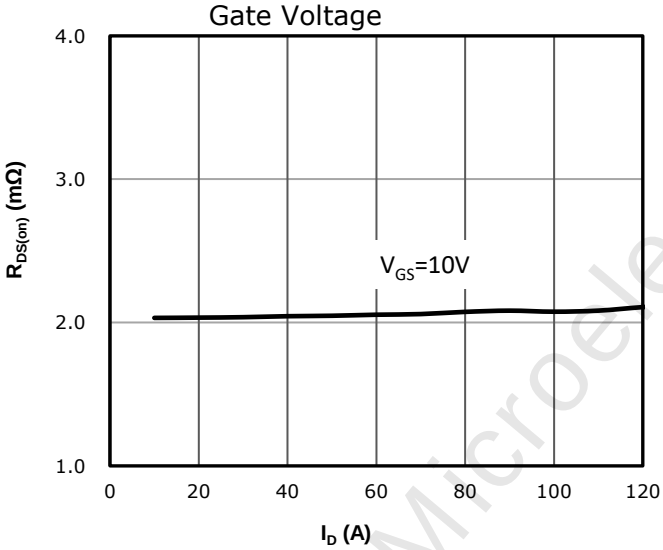


Fig 4: Rds(on) vs Gate Voltage

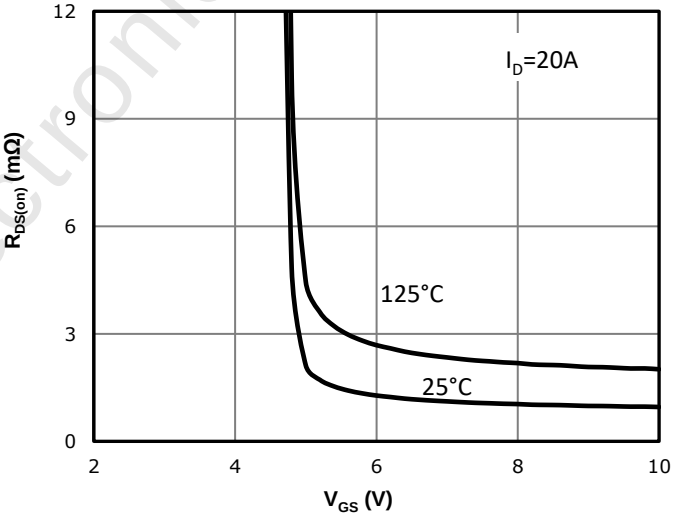


Fig 5: Rds(on) vs. Temperature

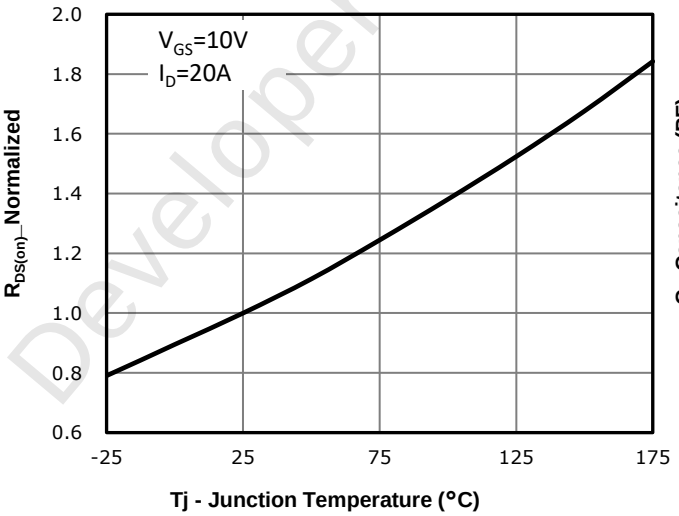


Fig 6: Capacitance Characteristics

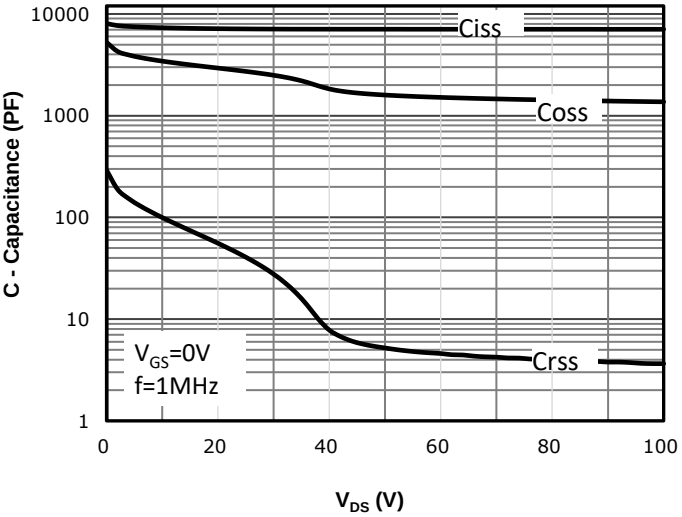


Fig 7: Gate Charge Characteristics

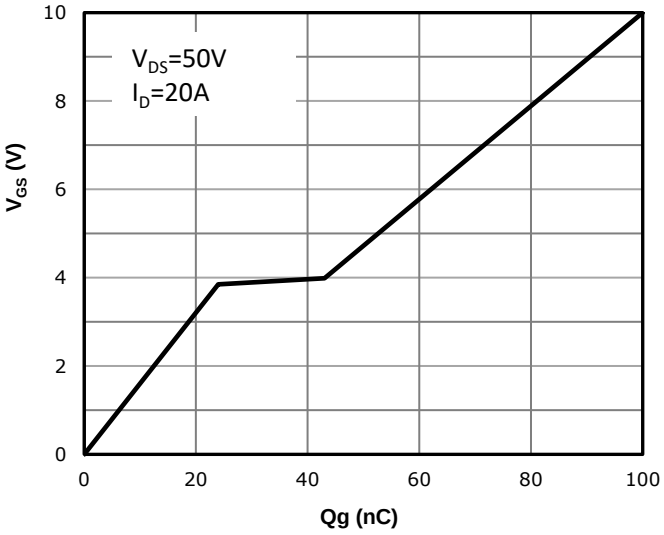


Fig 8: Body-diode Forward Characteristics

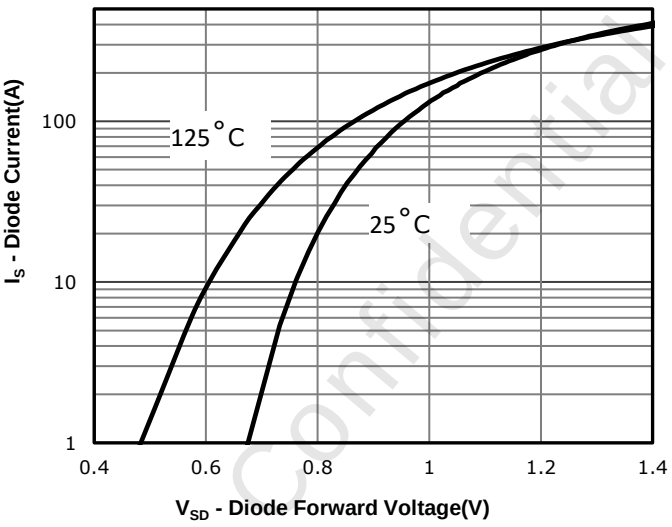


Fig 9: Power Dissipation

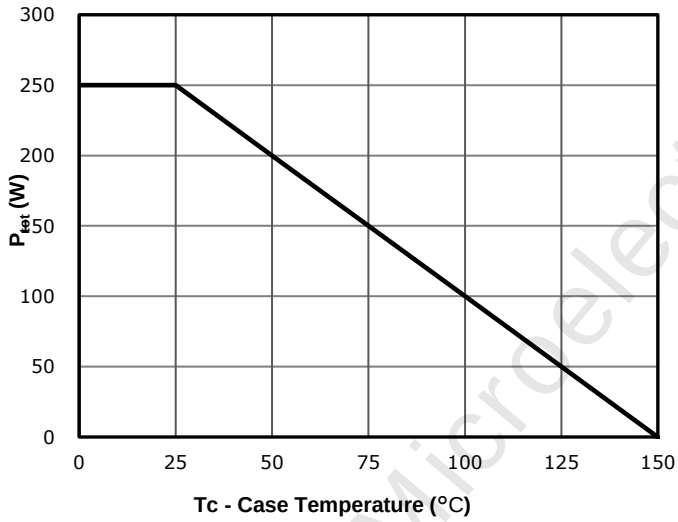


Fig 10: Drain Current Derating

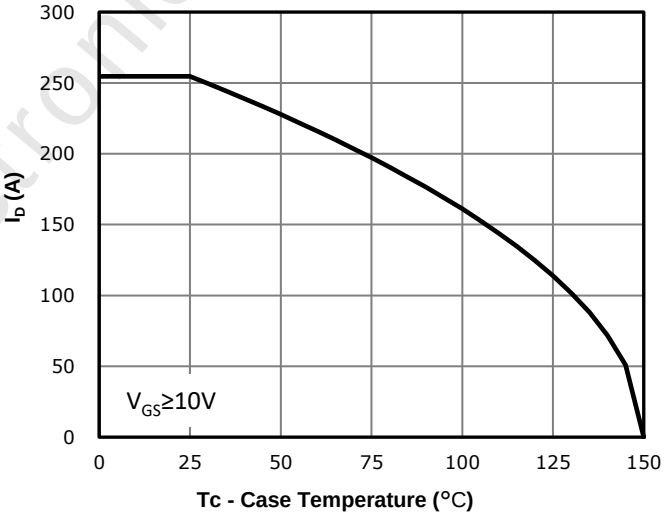


Fig 11: Safe Operating Area

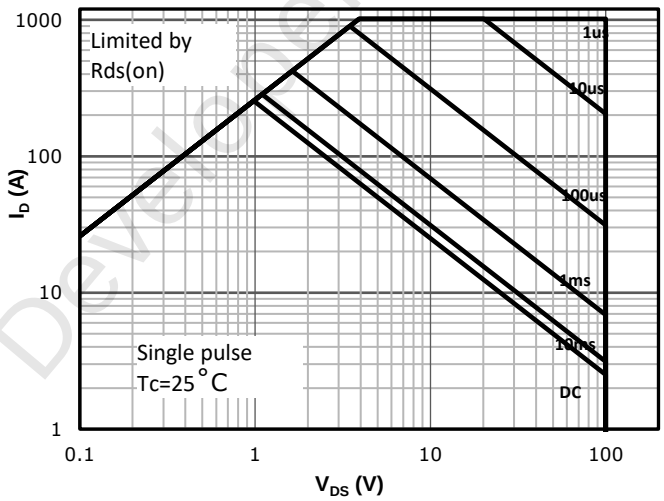
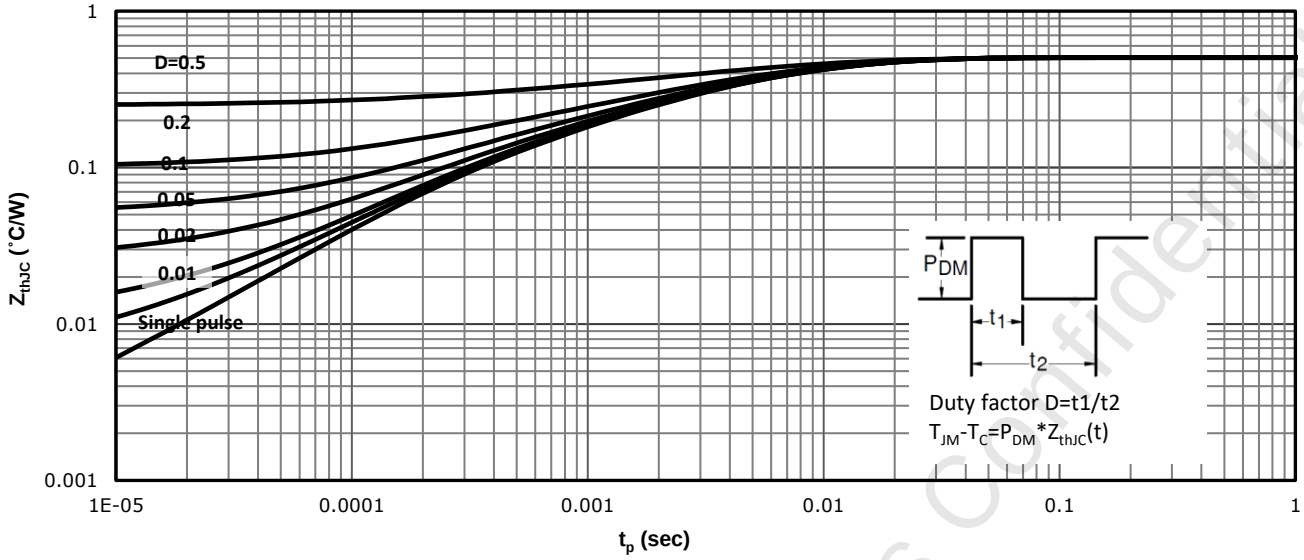
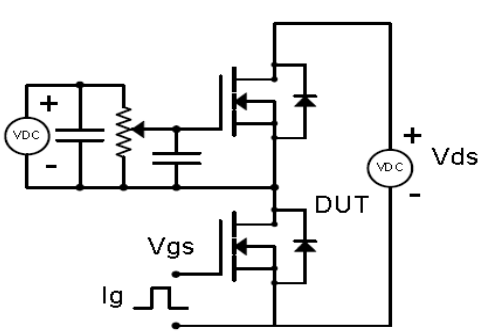


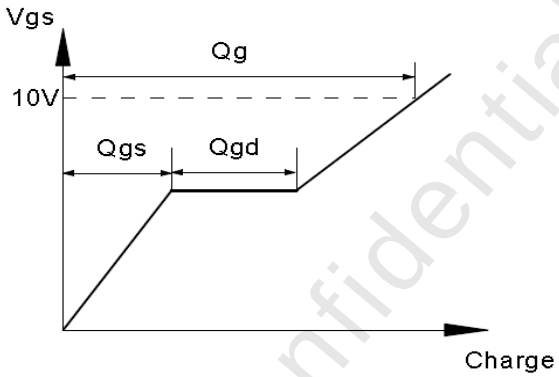
Fig 12: Max. Transient Thermal Impedance



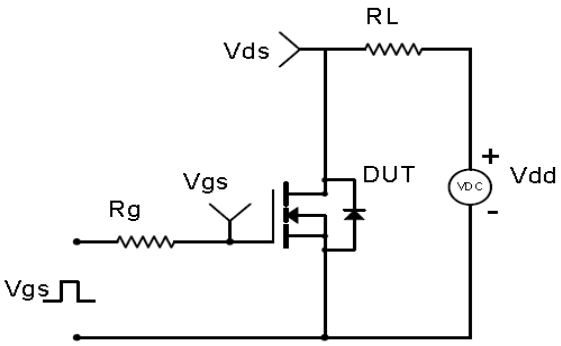
Test Circuit & Waveform

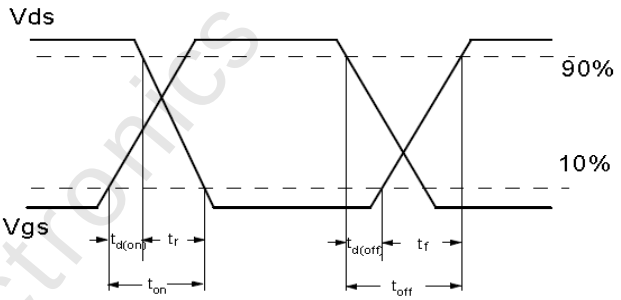
Gate Charge Test Circuit & Waveform



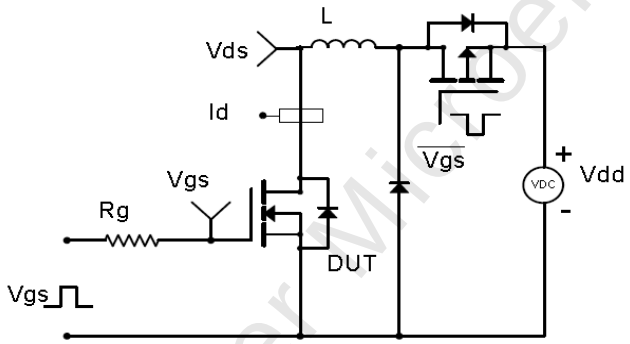


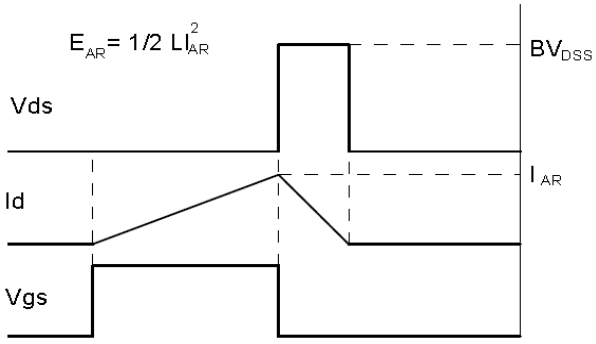
Resistive Switching Test Circuit & Waveforms



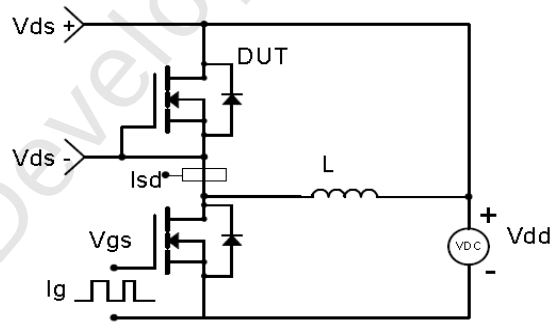


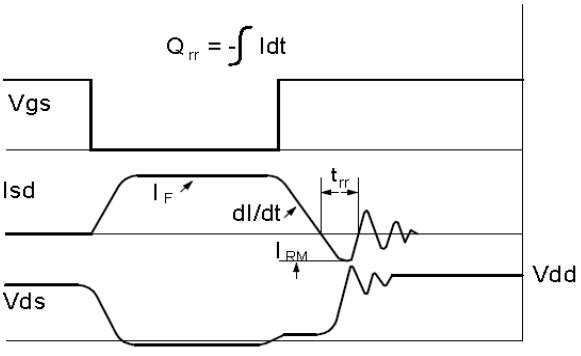
Unclamped Inductive Switching (UIS) Test Circuit & Waveforms



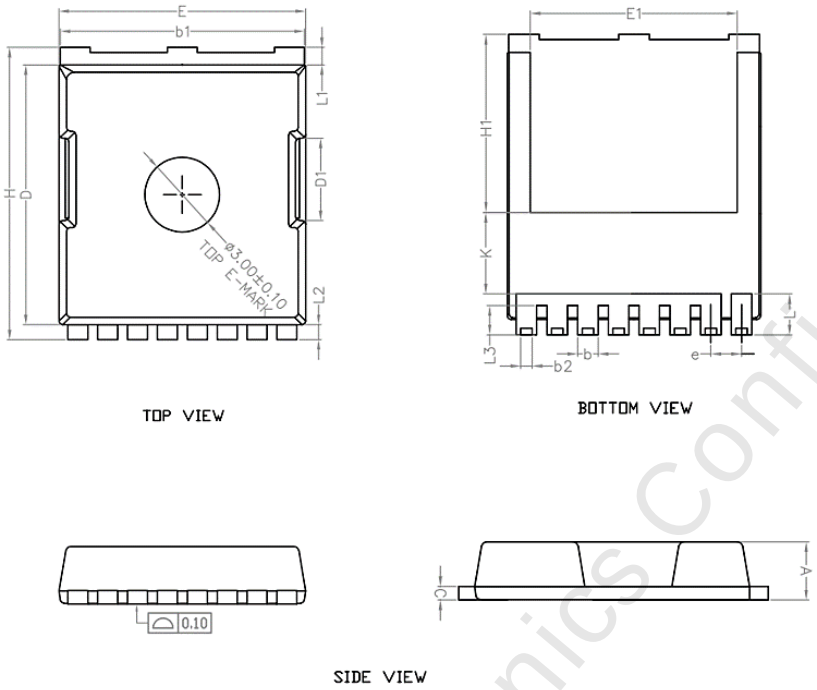


Diode Recovery Test Circuit & Waveforms



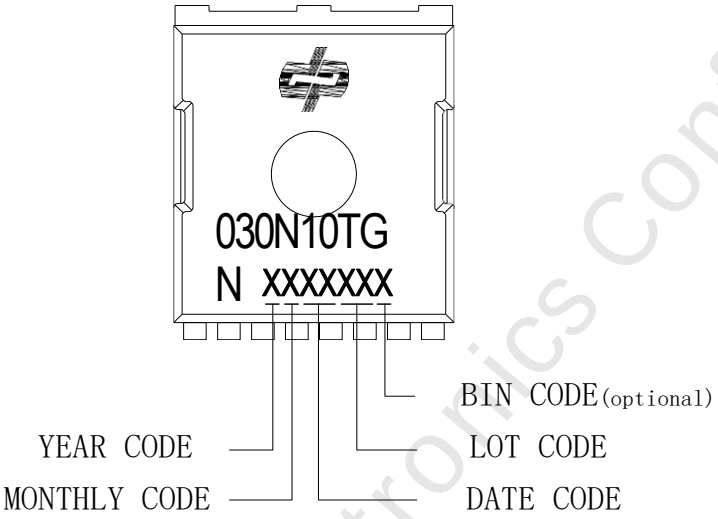


Package Outline: TOLL



Symbol	Common Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	2.20	2.40	0.09	0.09
b	0.70	0.90	0.03	0.04
b1	9.70	9.90	0.38	0.39
b2	0.40	0.50	0.02	0.02
c	0.40	0.60	0.02	0.02
D	10.28	10.58	0.40	0.42
D1	3.15	3.45	0.12	0.14
E	9.70	10.10	0.38	0.40
E1	7.90	8.30	0.31	0.33
e	1.10	1.30	0.04	0.05
H	11.48	11.88	0.45	0.47
H1	6.75	7.15	0.27	0.28
K	3.03	3.33	0.12	0.13
L	1.50	1.70	0.06	0.07
L1	0.55	0.85	0.02	0.03
L2	0.45	0.75	0.02	0.03
L3	1.00	1.30	0.04	0.05

Part Marking Information



Revision History

Revison	Major changes
1.10	Release for formal version

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