德普微电子
DEVELOPER MICROELECTRONICS

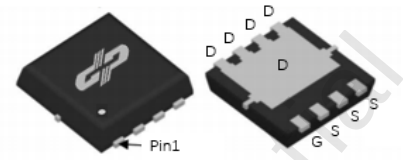
DP032N02MTS

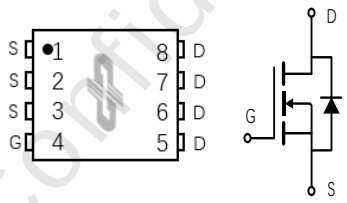
TRMOS N-MOSFET 20V, 2.7mΩ, 40A

Product Summary

Part #	V_{DS}	$R_{DS(on).typ}$ (@V_{GS}=4.5V)	$R_{DS(on).typ}$ (@V_{GS}=2.5V)	I_D
DP032N02MTS	20V	2.7mΩ	3.4mΩ	40A

DFN 3.3x3.3





100% Avalanche Tested

100% Rg Tested

Features

- Advanced high cell density Trench MOSFET technology
- Better $R_{DS(on)}$ enabled by a low $R_{DSon.sp}$, low conduction losses
- Excellent Q_gx$R_{DS(on)}$ product(FOM)
- Qualified according to JEDEC criteria

Applications

- Battery management
- Power Management Switches

Package Marking and Ordering Information

Part #	Marking	Package	Packing
DP032N02MTS	032N02MTS	DFN 3.3x3.3	Tape/Reel

Halogen-Free

Absolute Maximum Ratings

Parameter	Symbol	Value	Unit
Drain-source voltage	V_{DS}	20	V
Continuous drain current T_C = 25°C T_C = 100°C	I_D	 40 40	A
Pulsed drain current (T_C = 25°C, t_p limited by T_{jmax})	$I_{D\ pulse}$	160	A
Avalanche energy, single pulse (I=0.1mH, Rg=25)[1]	E_{AS}	55	mJ
Gate-Source voltage	V_{GS}	±10	V
Power dissipation (T_C = 25°C)	P_{tot}	33	W
Operating junction and storage temperature	T_j , T_{stg}	-55...+150	°C

[1].EAS is tested at starting T_j = 25℃, V_{GS} = 10V.

Thermal Resistance

Parameter	Symbol	Max	Unit
Thermal resistance, junction – case.	R_{thJC}	4	°C/W
Thermal resistance, junction – ambient(min. footprint)	R_{thJA}	58	

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}	20	-	-	V	V_{GS}=0V, I_D=250uA
Gate threshold voltage	$V_{GS(th)}$	0.4	-	1	V	V_{DS}=V_{GS},I_D=250uA
Zero gate voltage drain current	I_{DSS}	-	-	1	μA	V_{DS}=20V,V_{GS}=0V T_j=25°C
		-	-	100		T_j=150°C
Gate-source leakage current	I_{GSS}	-	-	±100	nA	V_{GS}=±10V,V_{DS}=0V
Drain-source on-state resistance	$R_{DS(on)}$	-	2.7	3.4	mΩ	T_j=25°C V_{GS}=4.5V, I_D=25A
		-	3.4	4.6	mΩ	V_{GS}=2.5V, I_D=20A
Dynamic Characteristic[2]						
Input Capacitance	C_{iss}	-	3554	-	pF	V_{GS}=0V, V_{DS}=10V, f=1MHz
Output Capacitance	C_{oss}	-	702	-		
Reverse Transfer Capacitance	C_{rss}	-	588	-		
Gate Total Charge(V_{GS}=10V)	Q_g	-	36	-	nC	V_{GS}=10V, V_{DS}=10V, I_D=20A, f=1MHz
Gate Total Charge(V_{GS}=4.5V)	Q_g	-	24	-		
Gate-Source charge	Q_{gs}	-	8	-		
Gate-Drain charge	Q_{gd}	-	13	-		
Turn-on delay time	$t_{d(on)}$	-	7	-	ns	V_{GS}=4.5V, V_{DD}=10V, R_{G_ext}=2.7Ω
Rise time	t_r	-	21	-		
Turn-off delay time	$t_{d(off)}$	-	32	-		
Fall time	t_f	-	20	-		

Body Diode Characteristic

Parameter	Symbol	Value			Unit	Test Condition
		min.	typ.	max.		
Body Diode Forward Voltage	V_{SD}	-	0.81	1.1	V	V_{GS}=0V,I_{SD}=20A
Diode continuous forward current	I_s	-	-	40	A	T_C = 25°C
Diode pluse current	$I_{s\ pluse}$	-	-	160	A	T_C = 25°C
Body Diode Reverse Recovery Time[2]	t_{rr}	-	49	-	ns	I_F=20A, dI/dt=100A/μs
Body Diode Reverse Recovery Charge[2]	Q_{rr}	-	32	-	nC	

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

Typical Performance Characteristics

Fig 1: Output Characteristics

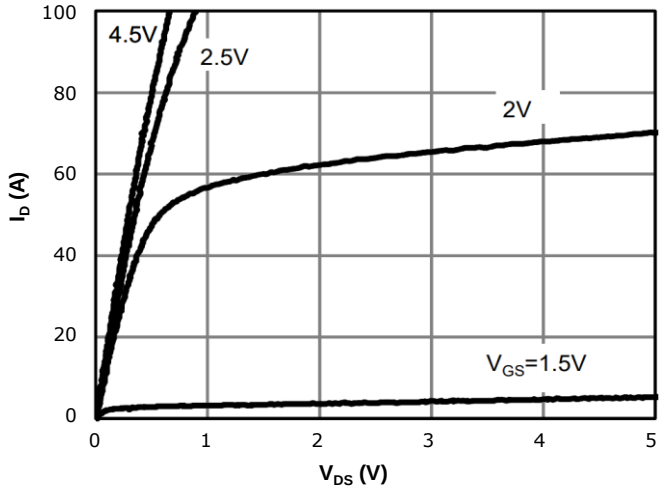


Fig 2: Transfer Characteristics

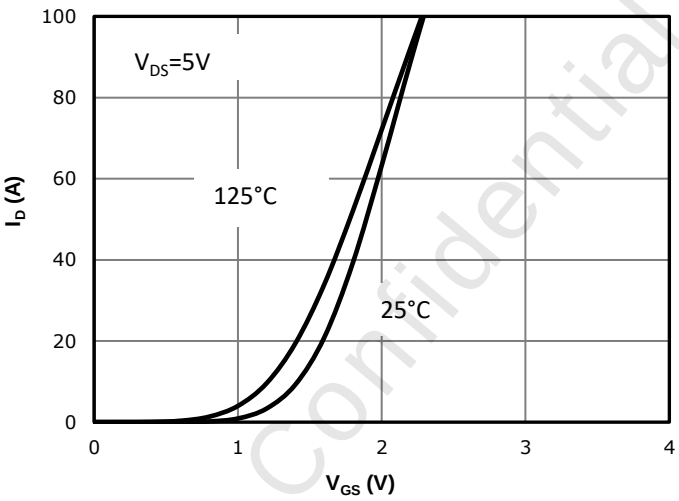


Fig 3: Rds(on) vs Drain Current and Gate Voltage

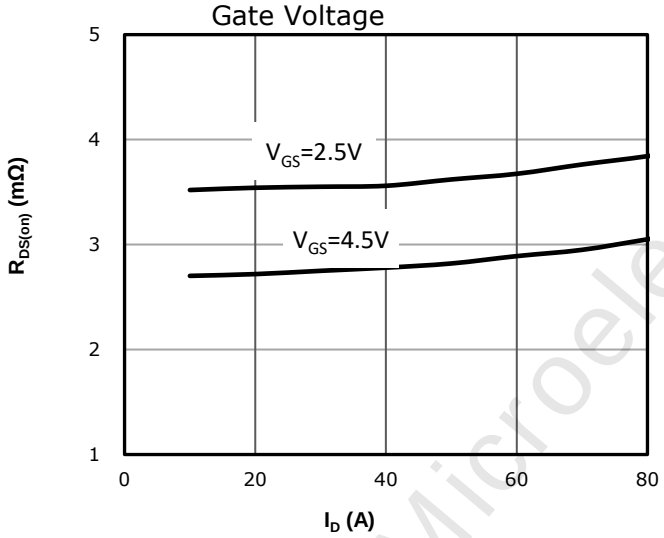


Fig 4: Rds(on) vs Gate Voltage

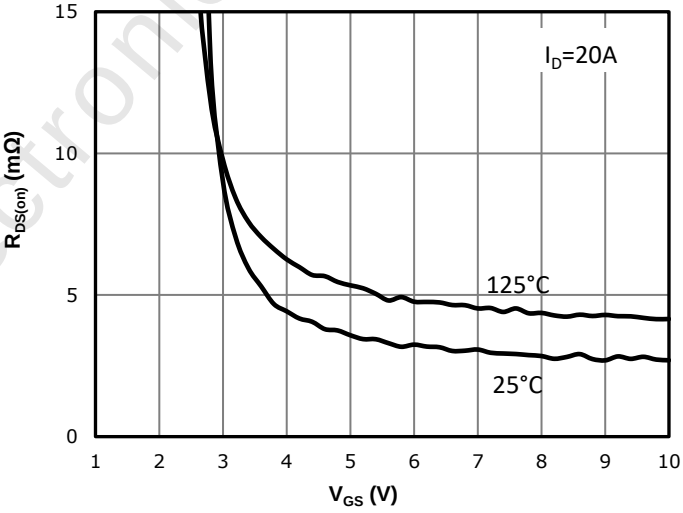


Fig 5: Rds(on) vs. Temperature

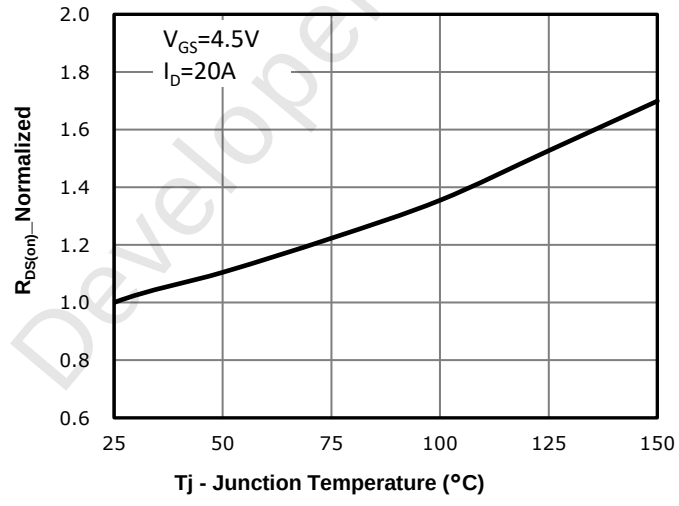


Fig 6: Capacitance Characteristics

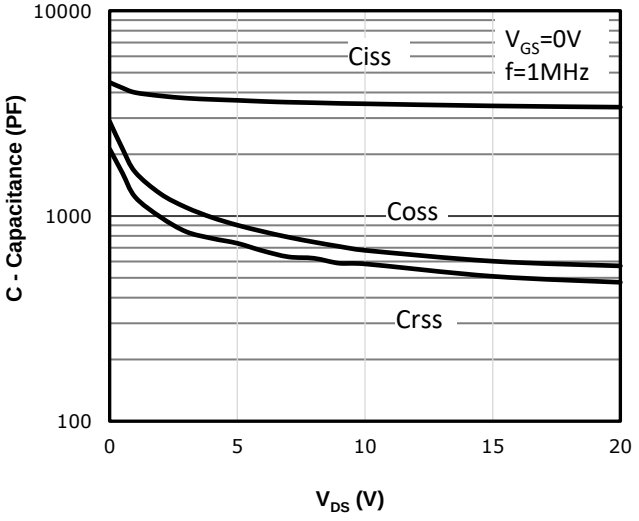


Fig 7: Gate Charge Characteristics

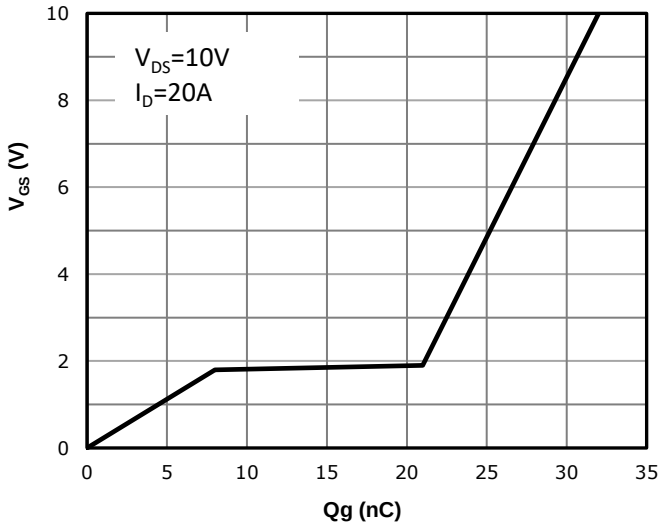


Fig 8: Body-diode Forward Characteristics

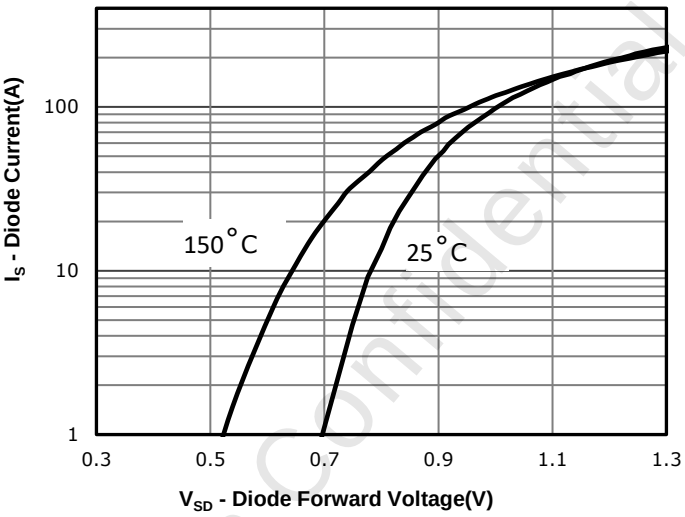


Fig 9: Power Dissipation

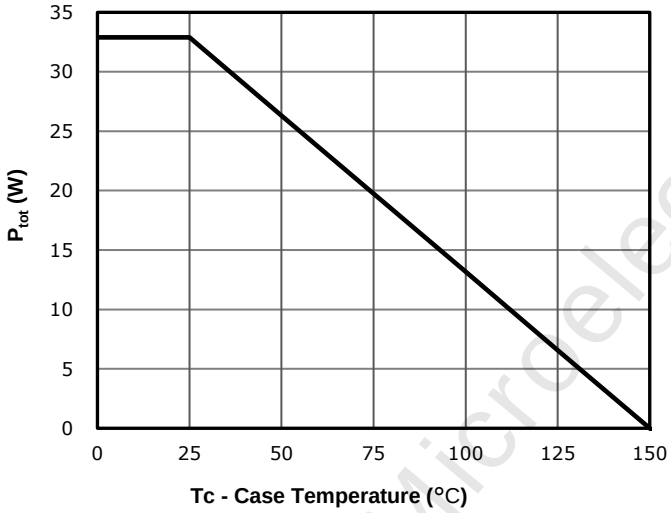


Fig 10: Drain Current Derating

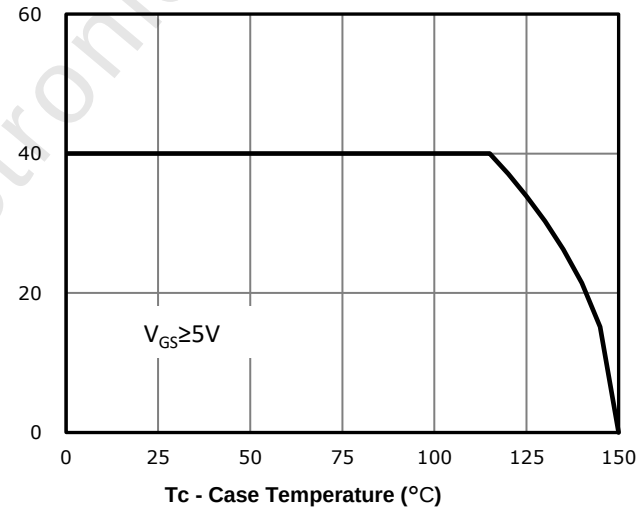


Fig 11: Safe Operating Area

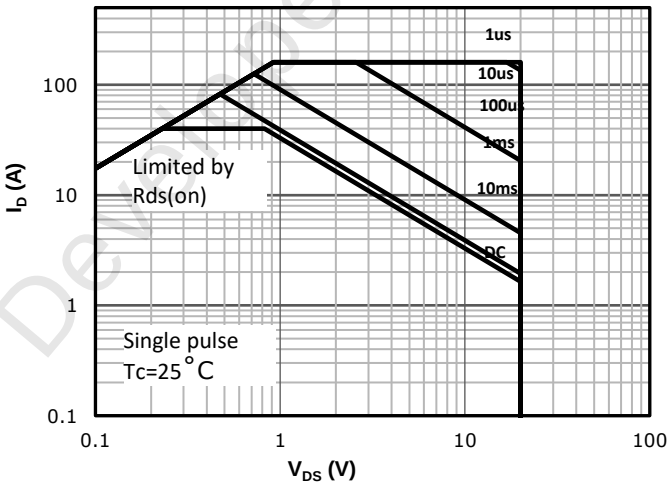
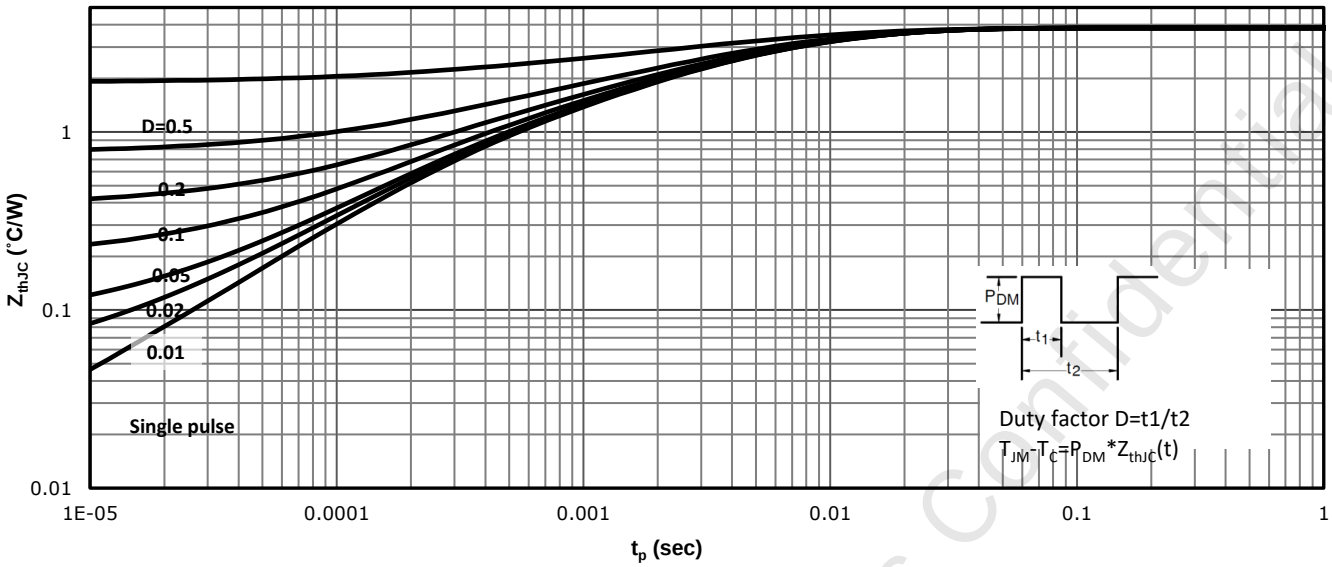
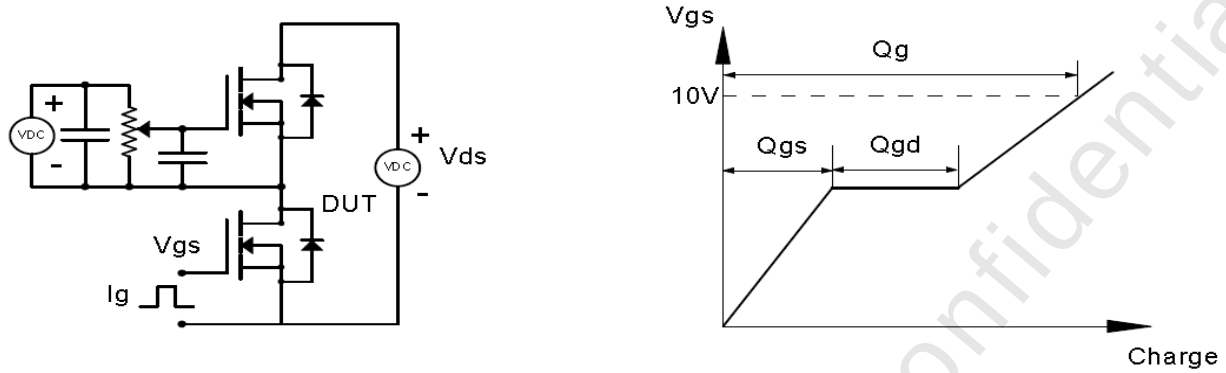


Fig 12: Max. Transient Thermal Impedance

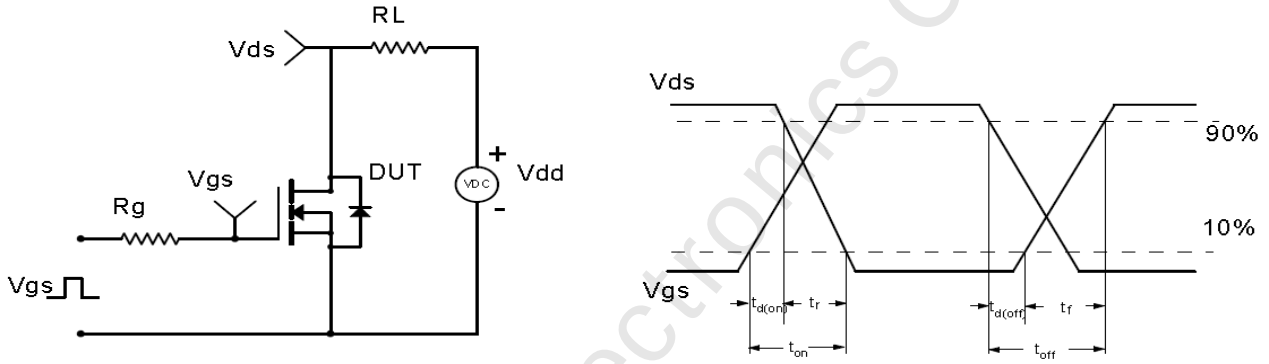


Test Circuit & Waveform

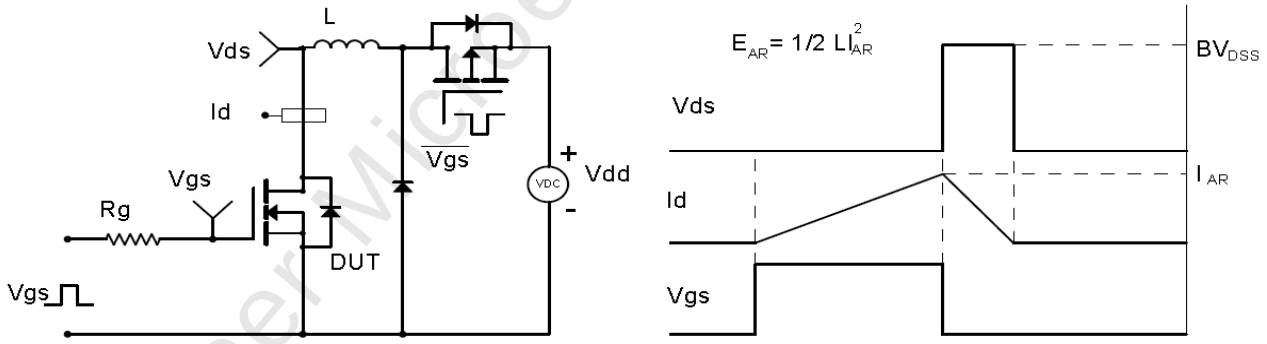
Gate Charge Test Circuit & Waveform



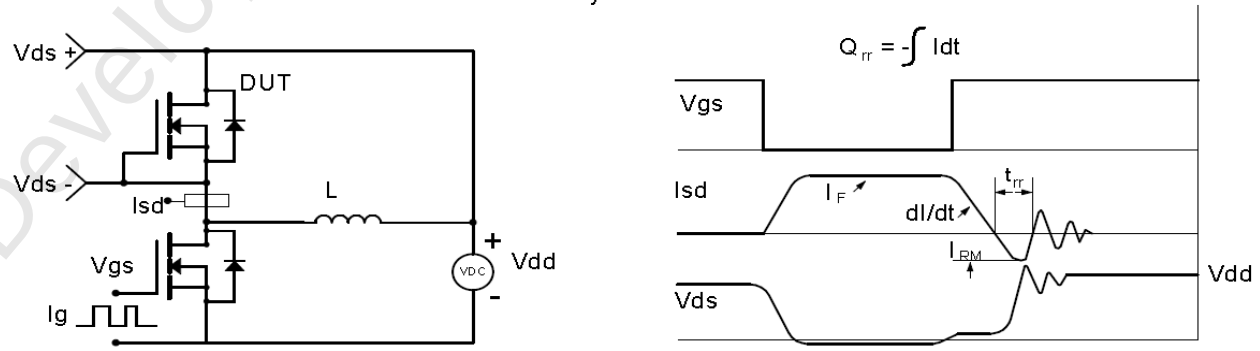
Resistive Switching Test Circuit & Waveforms



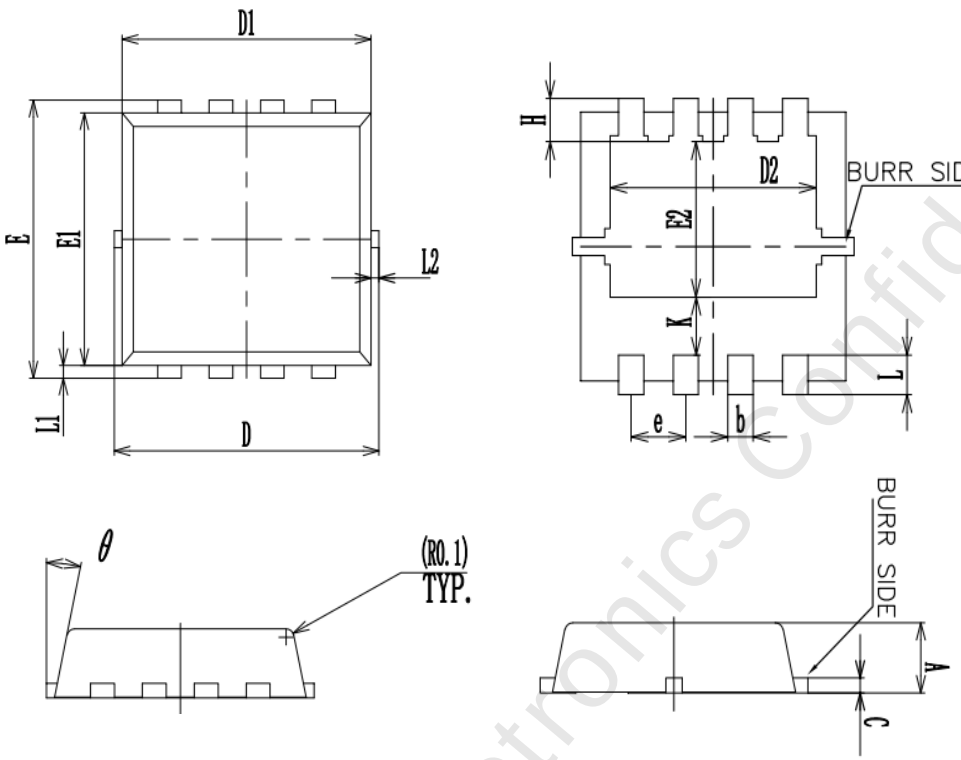
Unclamped Inductive Switching (UIS) Test Circuit & Waveforms



Diode Recovery Test Circuit & Waveforms

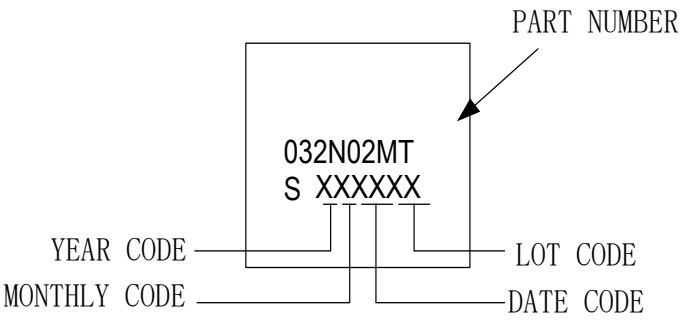


Package Outline: DFN 3.3x3.3



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	0.70	0.90	0.028	0.035
b	0.25	0.35	0.010	0.014
c	0.14	0.15	0.006	0.006
D	3.15	3.30	0.124	0.130
D1	3.05	3.15	0.120	0.124
D2	2.35	2.45	0.093	0.096
e	0.65 BSC		0.026 BSC	
E	3.20	3.30	0.126	0.130
E1	2.90	3.00	0.114	0.118
E2	1.64	1.74	0.065	0.069
H	0.38	0.48	0.015	0.019
K	0.59	0.69	0.023	-
L	0.25	0.40	0.010	0.016
L1	0.10	0.15	0.004	0.006
L2	-	0.15	-	0.006
θ	8°	12°	-	-

Part Marking Information



Revision History

Revison	Major changes
1.0	Release for formal version

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