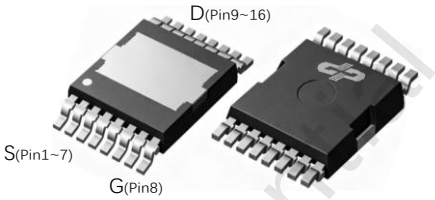
DP050N15JGN2

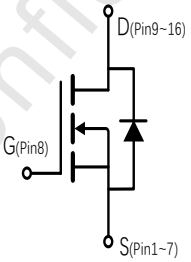
DPMOS N-MOSFET 150V, 4.5mΩ, 177A

Product Summary

Part #	V_{DS}	$R_{DS(on).typ}$	I_D
DP050N15JGN2	150V	4.5mΩ	177A

TOLT





100% Avalanche Tested

100% Rg Tested

Features

- Uses advanced 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)

Package Marking and Ordering Information

Part #	Marking	Package	Packing
DP050N15JGN2	050N15JGN2	TOLT	Tape/Reel

Halogen-Free

Absolute Maximum Ratings

Parameter	Symbol	Value	Unit
Drain-source voltage	V_{DS}	150	V
Continuous drain current T_C = 25°C T_C = 100°C	I_D	 177 112	A
Pulsed drain current (T_C = 25°C, t_p limited by T_{jmax})	$I_{D\ pulse}$	708	A
Avalanche energy, single pulse (L=0.5mH, Rg=25)[1]	E_{AS}	930	mJ
Gate-Source voltage	V_{GS}	±20	V
Power dissipation (T_C = 25°C)	P_{tot}	347	W
Operating junction and storage temperature	T_j , T_{stg}	-55...+150	°C

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

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Thermal Resistance

Parameter	Symbol	Max	Unit
Thermal resistance, junction – case.	R_{thJC}	0.36	°C/W
Thermal resistance, junction – ambient(min. footprint)	R_{thJA}	48	

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}	150	-	-	V	V_{GS}=0V, I_D=250uA
Gate threshold voltage	$V_{GS(th)}$	2	3	4	V	V_{DS}=V_{GS},I_D=250uA
Zero gate voltage drain current	I_{DSS}	- -	- -	1 100	μA	V_{DS}=150V,V_{GS}=0V T_j=25°C T_j=150°C
Gate-source leakage current	I_{GSS}	-	-	±100	nA	V_{GS}=±20V,V_{DS}=0V
Drain-source on-state resistance	$R_{DS(on)}$	-	4.5	5.6	mΩ	T_j=25°C V_{GS}=10V, I_D=60A
Gate resistance	R_g	-	1.5	5	Ω	V_{GS}=0V, V_{DS}=0V, f=1MHz
Transconductance[2]	g_{fs}	-	110	-	S	V_{DS}=5V,I_D=60A
Dynamic Characteristic[2]						
Input Capacitance	C_{iss}	-	5935	-	pF	VGS=0V, VDS=75V, f=1MHz
Output Capacitance	C_{oss}	-	782	-		
Reverse Transfer Capacitance	C_{rss}	-	94	-		
Gate Total Charge	Q_g	-	84	-	nC	VGS=10V, VDS=75V, ID=80A, f=1MHz
Gate-Source charge	Q_{gs}	-	6	-		
Gate-Drain charge	Q_{gd}	-	13	-		
Turn-on delay time	$t_{d(on)}$	-	25	-	ns	VGS=10V, VDD=75V, RG_ext=2.7Ω
Rise time	t_r	-	81	-		
Turn-off delay time	$t_{d(off)}$	-	56	-		
Fall time	t_f	-	34	-		

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Body Diode Characteristic

Parameter	Symbol	Value			Unit	Test Condition
		min.	typ.	max.		
Body Diode Forward Voltage	V_{SD}	-	0.85	1.3	V	V_{GS}=0V,I_{SD}=60A
Diode continuous forward current	I_s	-	180	-	A	TC = 25°C
Diode pluse current	$I_{s\ pluse}$	-	708	-	A	TC = 25°C
Body Diode Reverse Recovery Time[2]	t_{rr}	-	83	-	ns	I_F=60A, dI/dt=100A/μs
Body Diode Reverse Recovery Charge[2]	Q_{rr}	-	540	-	nC	

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

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Typical Performance Characteristics

Fig 1: Output Characteristics

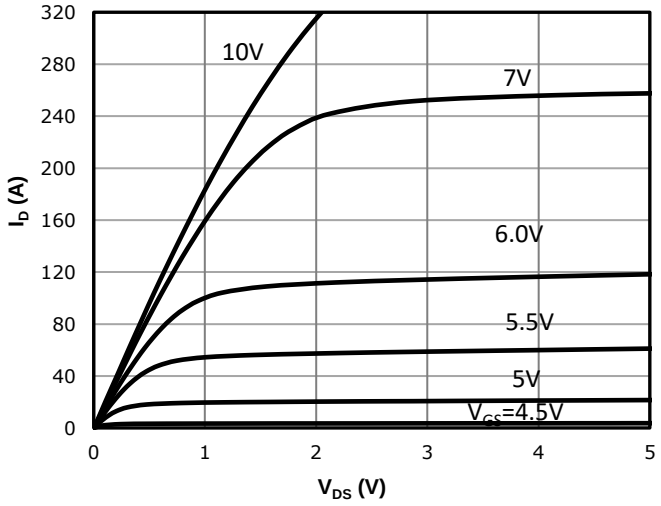


Fig 2: Transfer Characteristics

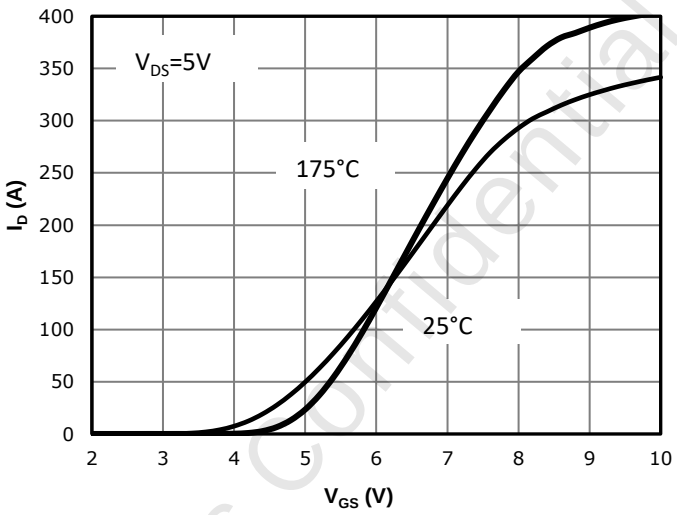


Fig 3: Rds(on) vs Drain Current and Gate Voltage

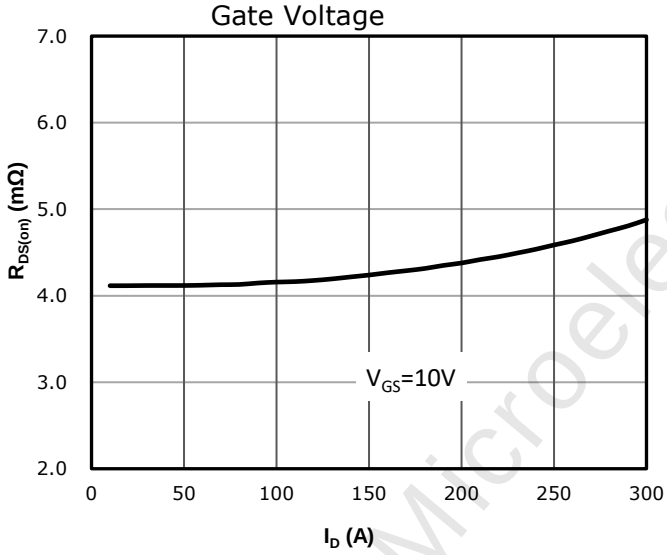


Fig 4: Rds(on) vs Gate Voltage

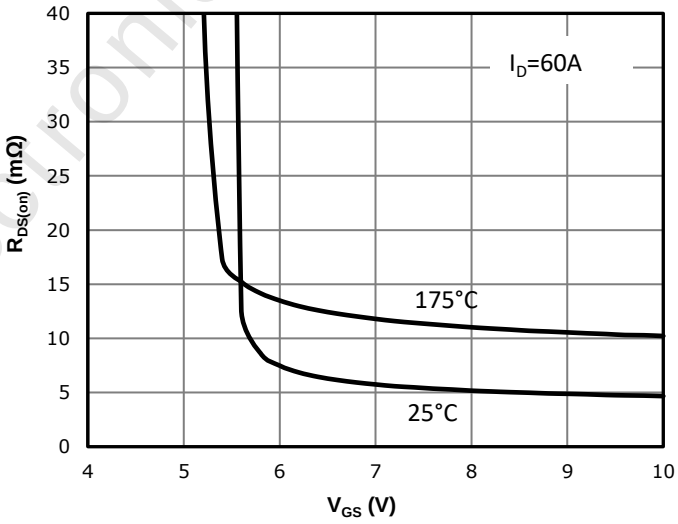


Fig 5: Rds(on) vs. Temperature

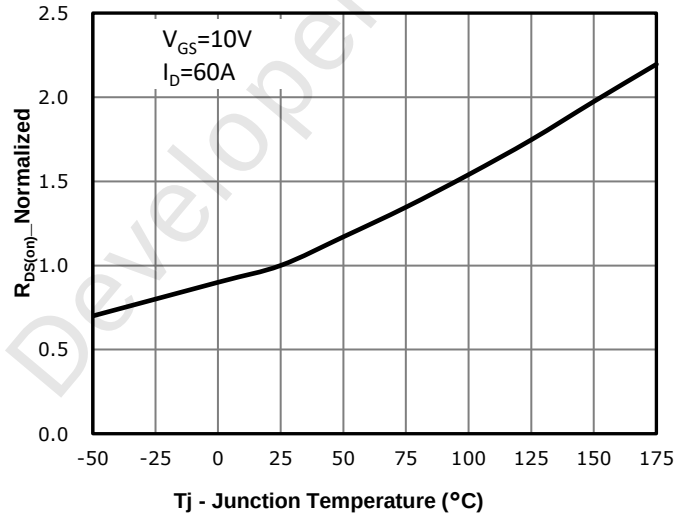
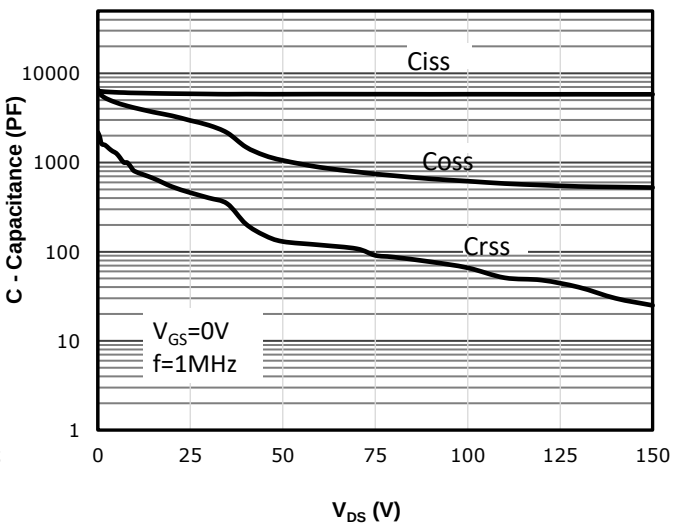


Fig 6: Capacitance Characteristics



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Fig 7: Gate Charge Characteristics

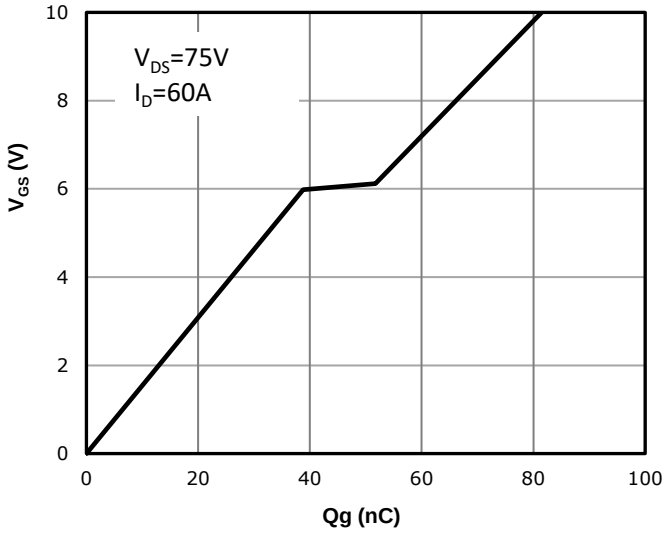


Fig 8: Body-diode Forward Characteristics

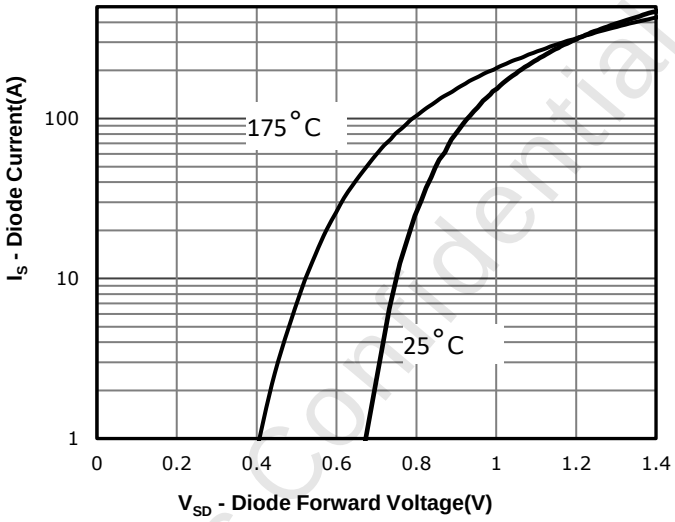


Fig 9: Power Dissipation

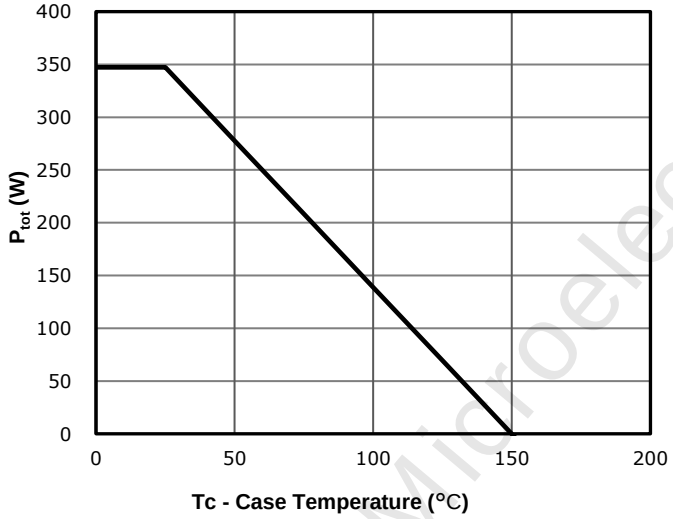


Fig 10: Drain Current Derating

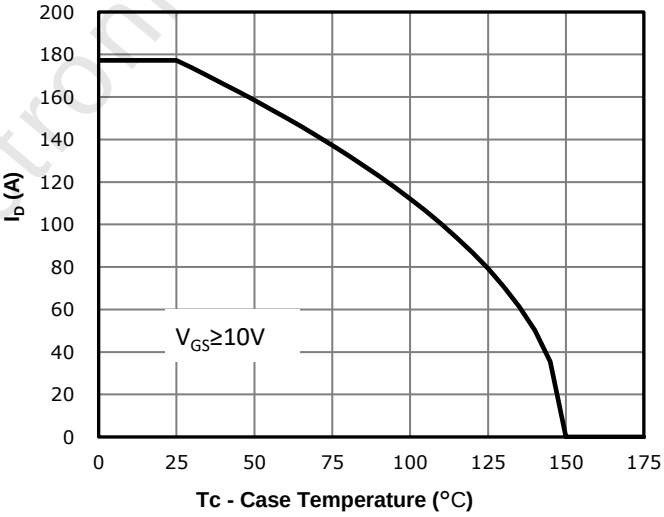
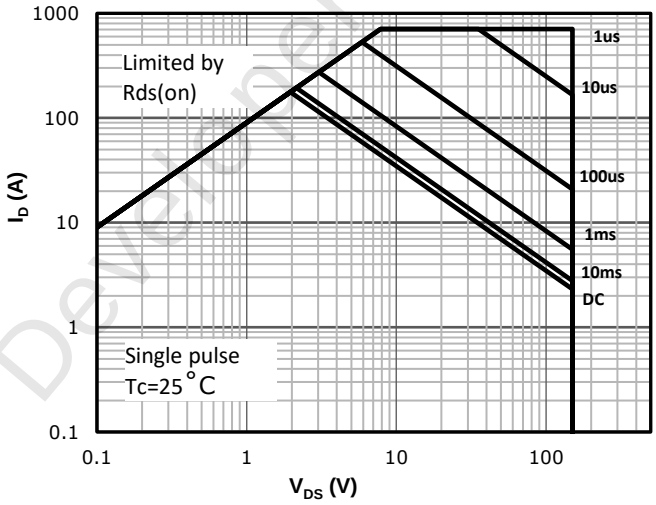
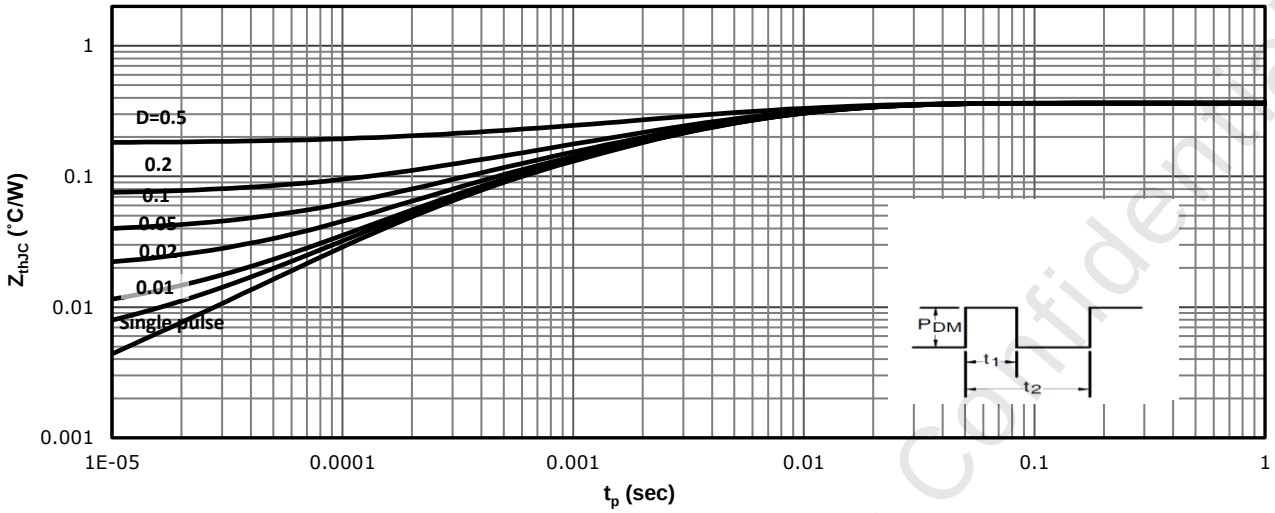


Fig 11: Safe Operating Area



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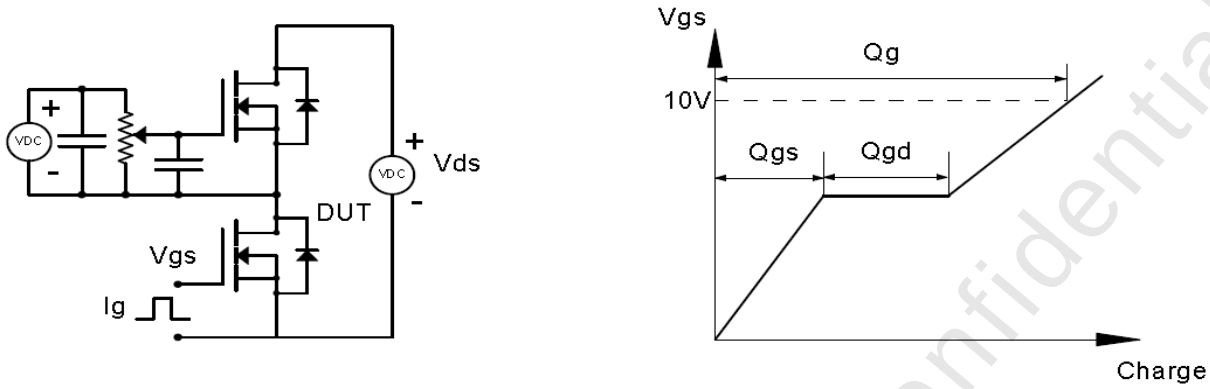
Fig 12: Max. Transient Thermal Impedance



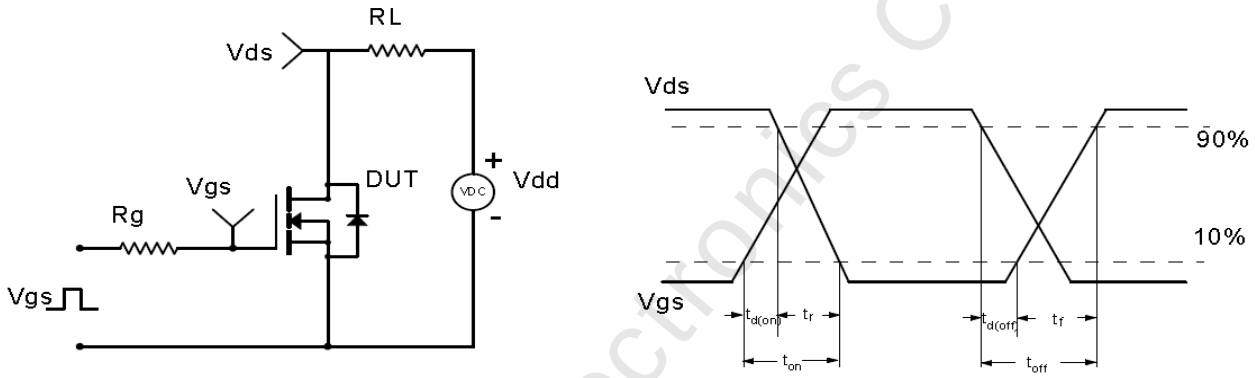
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Test Circuit & Waveform

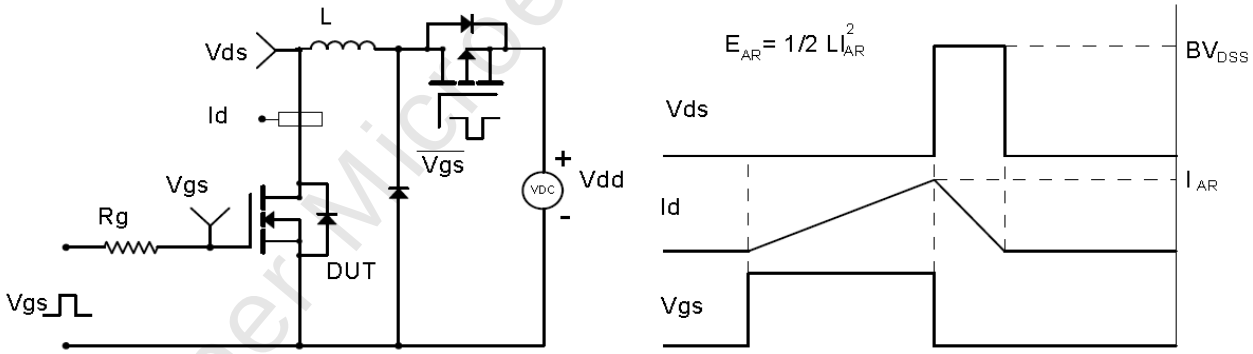
Gate Charge Test Circuit & Waveform



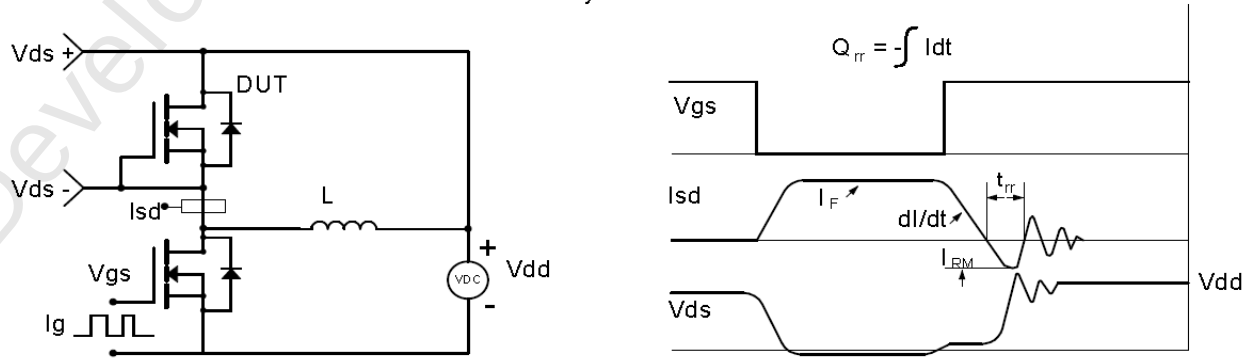
Resistive Switching Test Circuit & Waveforms



Unclamped Inductive Switching (UIS) Test Circuit & Waveforms

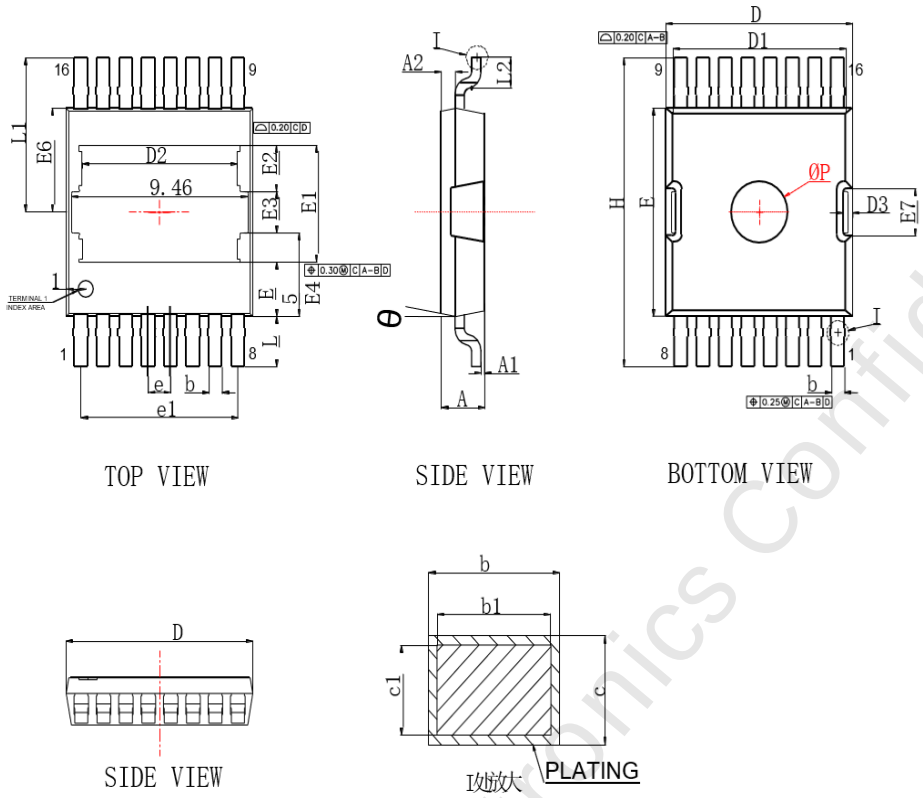


Diode Recovery Test Circuit & Waveforms



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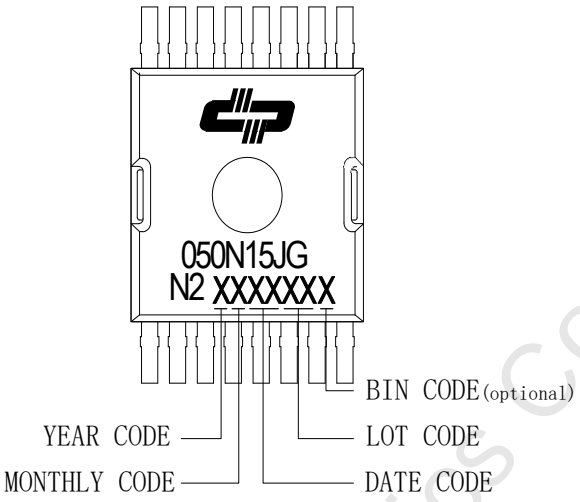
Package Outline: TOLT



Symbol	Common Dimensions In Millimeters		
	Min.	NOM	Max.
A	2.2	2.3	2.35
A1	0.01	0.08	0.16
A2	0.66	0.76	0.86
b	0.7	0.75	0.8
b1	0.67	0.7	0.73
c	0.5	0.55	0.6
c1	0.48	0.5	0.52
D	9.9	10	10.1
D1	9.36	9.46	9.56
D2	8.2	8.3	8.4
D3	0.42	0.52	0.62
H	14.8	15	15.2
E	10	10.1	10.3
E1	5.57	5.67	5.77
E2	2.14	2.24	2.34
E3	1.9	2	2.1
E4	3.95	4.05	4.15
E5	2.52	2.62	2.72
E6	4.95	5.05	5.15
E7	2.18	2.28	2.38
e	1.17	1.2	1.23
e1		8.4	
L	2.35	2.45	2.55
L1	7.4	7.5	7.6
L2	1.4	1.5	1.6
P	2.9	3	3.1
θ	9°	10°	11°

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Part Marking Information



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Revision History

Revison	Major changes
1.0	Release for formal version1.0

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