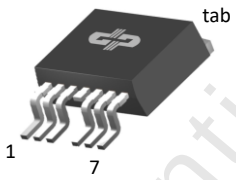
DP023N10GGNT

DPMOS N-MOSFET 100V, 1.2mΩ, 308A

Product Summary

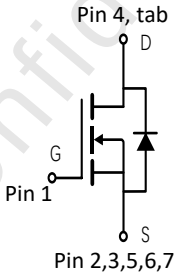
Part #	V_{DS}	$R_{DS(on).typ}$	I_D
DP023N10GGNT	100V	1.2mΩ	308A

TO263-7L



Features

- Uses advanced Trench MOSFET-DPMOS 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)

100% Avalanche Tested

100% Rg Tested

Package Marking and Ordering Information

Part #	Marking	Package	Packing
DP023N10GGNT	023N10GGN	TO263-7L	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	 308 218	A
Pulsed drain current (T_C = 25°C, t_p limited by T_{jmax})	$I_{D\ pulse}$	1232	A
Avalanche energy, single pulse (L=0.5mH, Rg=25Ω)[1]	E_{AS}	1681	mJ
Gate-Source voltage	V_{GS}	±20	V
Power dissipation (T_C = 25°C)	P_{tot}	273	W
Operating junction and storage temperature	T_j , T_{stg}	-55...+175	°C

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

Thermal Resistance

Parameter	Symbol	Max	Unit
Thermal resistance, junction – case.	R_{thJC}	0.6	°C/W
Thermal resistance, junction – ambient(min. footprint)	R_{thJA}	62	

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	2.9	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}	-	±10	±100	nA	V_{GS}=±20V,V_{DS}=0V
Drain-source on-state resistance	$R_{DS(on)}$	-	1.2	1.5	mΩ	V_{GS}=10V, I_D=90A
Gate resistance	R_g	-	2.4	-	Ω	V_{GS}=0V, V_{DS}=0V, f=1MHz
Transconductance[2]	g_{fs}	-	265	-	S	V_{DS}=5V,I_D=90A
Dynamic Characteristic[2]						
Input Capacitance	C_{iss}	-	12620	-	pF	V_{GS}=0V, V_{DS}=50V, f=1MHz
Output Capacitance	C_{oss}	-	2121	-		
Reverse Transfer Capacitance	C_{rss}	-	265	-		
Gate Total Charge	Q_g	-	230	-	nC	V_{GS}=10V, V_{DS}=20V, I_D=20A, f=1MHz
Gate-Source charge	Q_{gs}	-	55	-		
Gate-Drain charge	Q_{gd}	-	73	-		
Turn-on delay time	$t_{d(on)}$	-	49	-	ns	V_{GS}=10V, V_{DD}=50V, R_{G_ext}=2.7Ω
Rise time	t_r	-	97	-		
Turn-off delay time	$t_{d(off)}$	-	120	-		
Fall time	t_f	-	71	-		

Body Diode Characteristic

Parameter	Symbol	Value			Unit	Test Condition
		min.	typ.	max.		
Body Diode Forward Voltage	V_{SD}	-	0.85	1.2	V	V_{GS}=0V,I_{SD}=90A
Diode continuous forward current	I_s	-	-	308	A	T_C = 25°C
Diode pluse current	$I_{s\ pluse}$	-	-	1232	A	T_C = 25°C
Body Diode Reverse Recovery Time[2]	t_{rr}	-	116	-	ns	I_F=15A, dI/dt=100A/μs
Body Diode Reverse Recovery Charge[2]	Q_{rr}	-	273	-	nC	

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

Typical Performance Characteristics

Fig 1: Output Characteristics

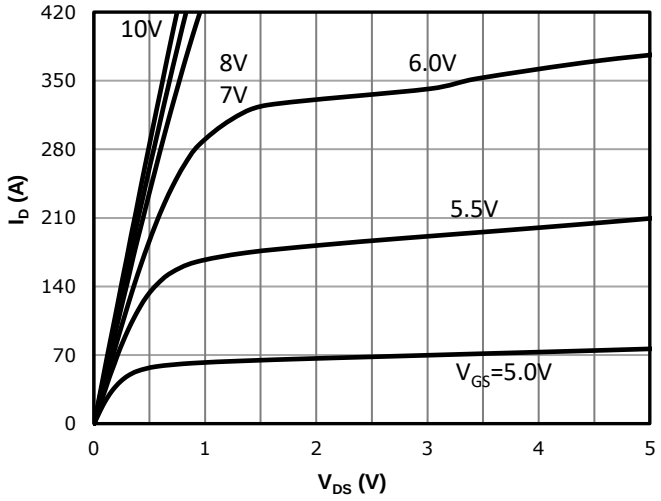


Fig 2: Transfer Characteristics

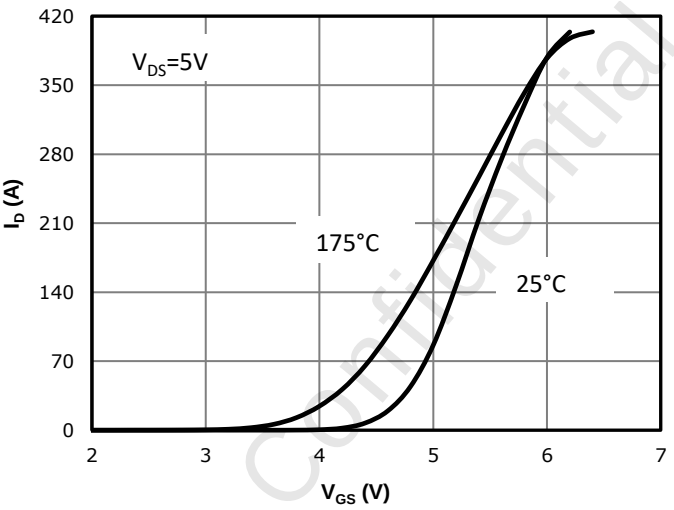


Fig 3: Rds(on) vs Drain Current and Gate Voltage

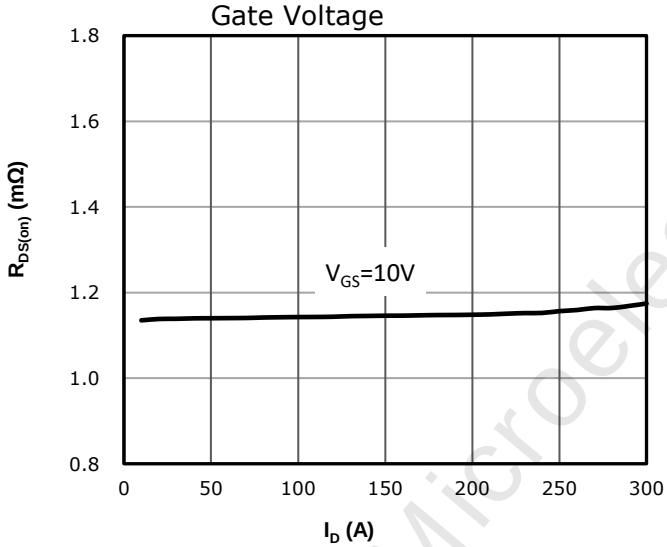


Fig 4: Rds(on) vs Gate Voltage

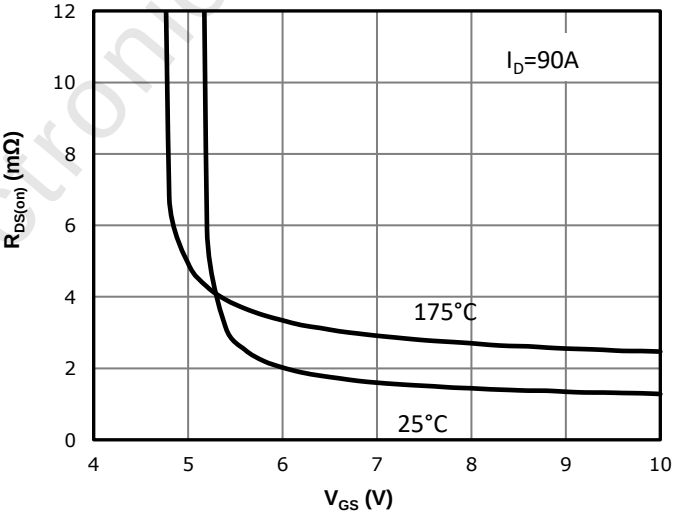


Fig 5: Rds(on) vs. Temperature

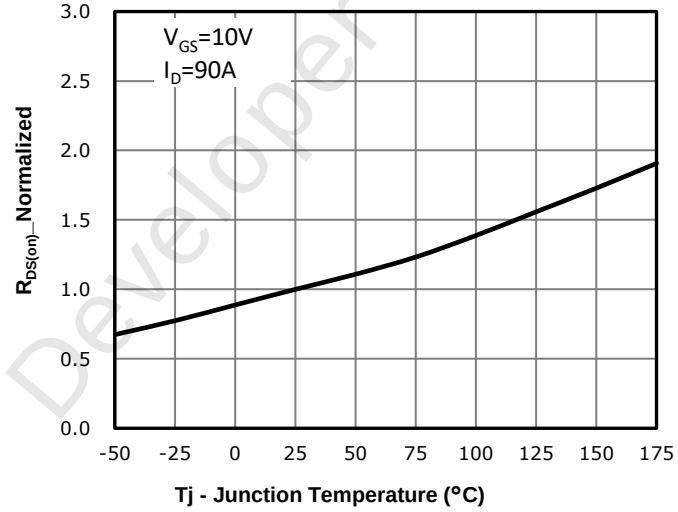


Fig 6: Capacitance Characteristics

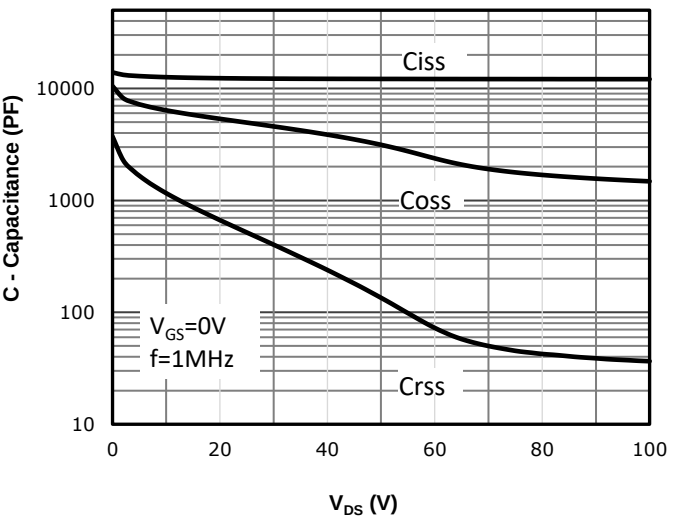


Fig 7: Gate Charge Characteristics

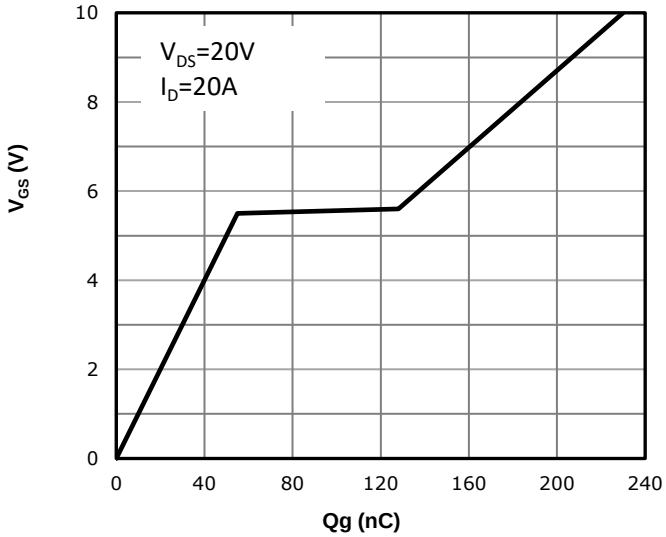


Fig 8: Body-diode Forward Characteristics

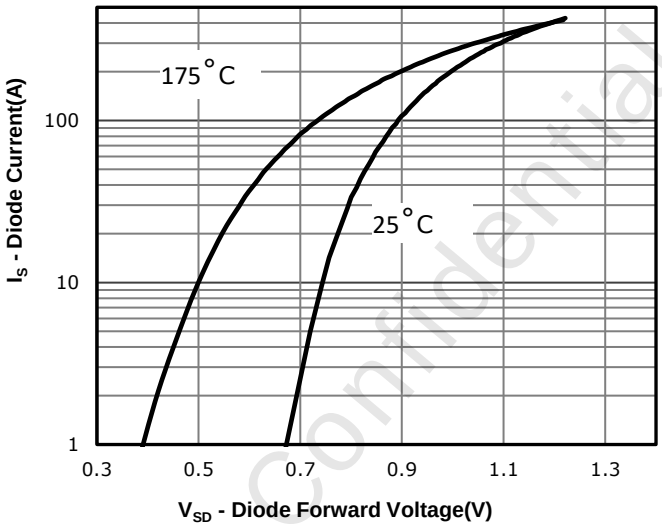


Fig 9: Power Dissipation

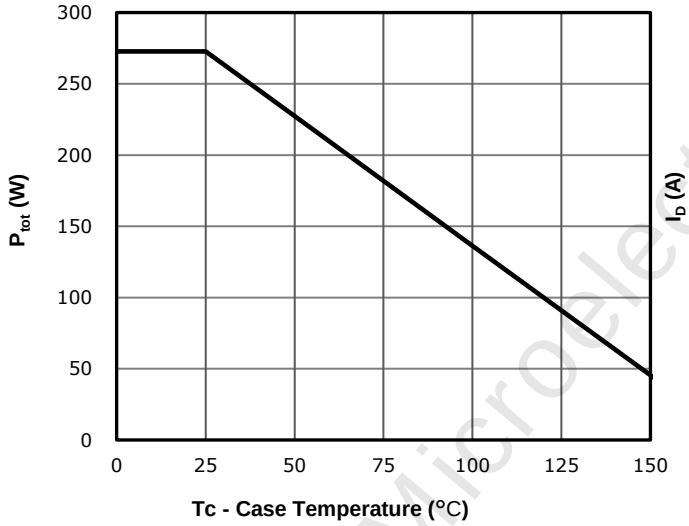


Fig 10: Drain Current Derating

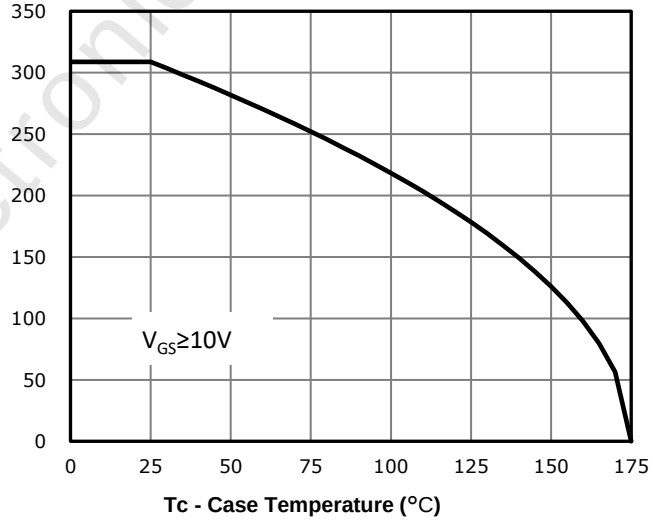


Fig 11: Safe Operating Area

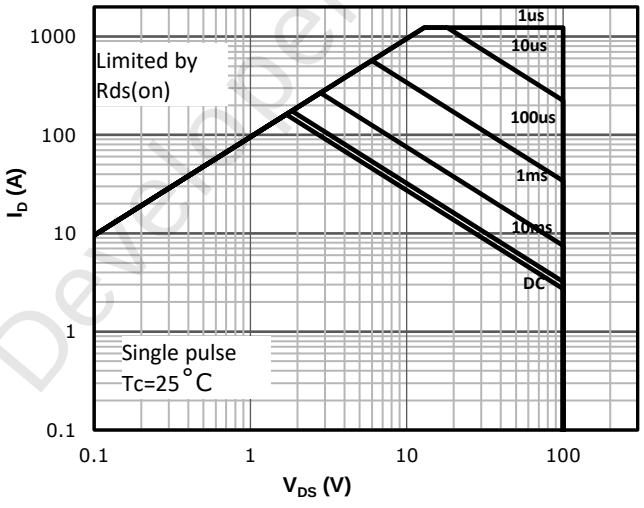
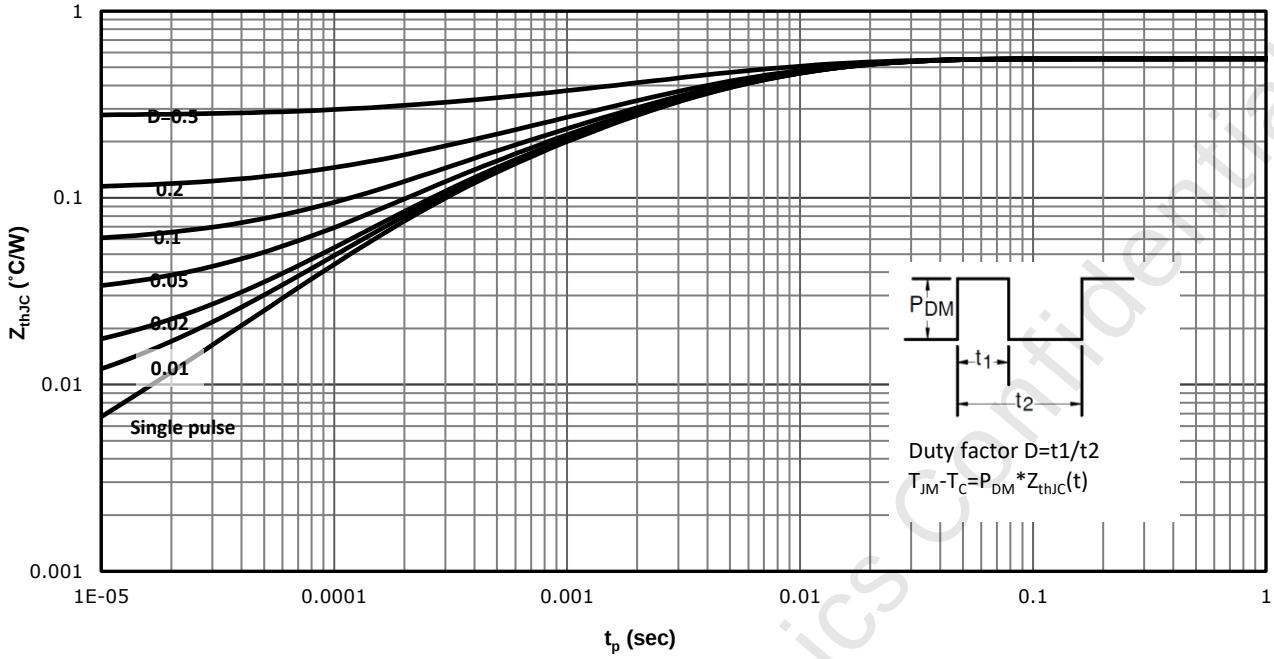
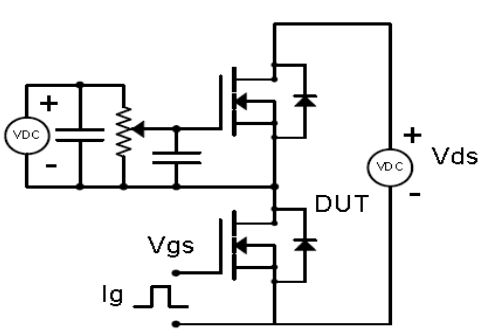


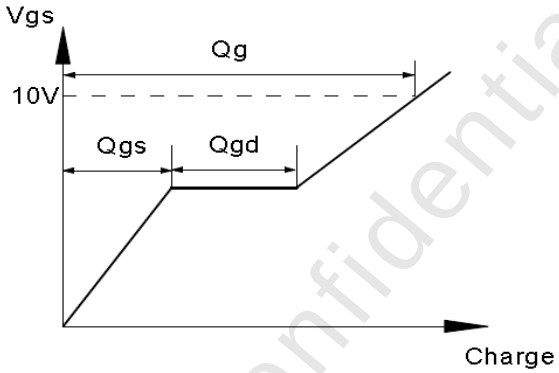
Fig 12: Max. Transient Thermal Impedance



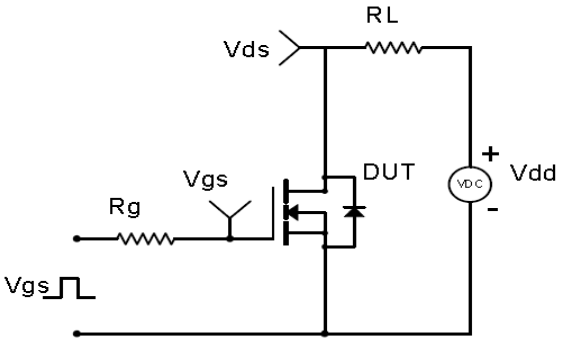
Test Circuit & Waveform

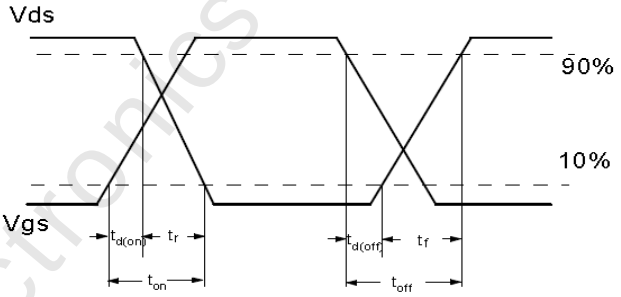
Gate Charge Test Circuit & Waveform



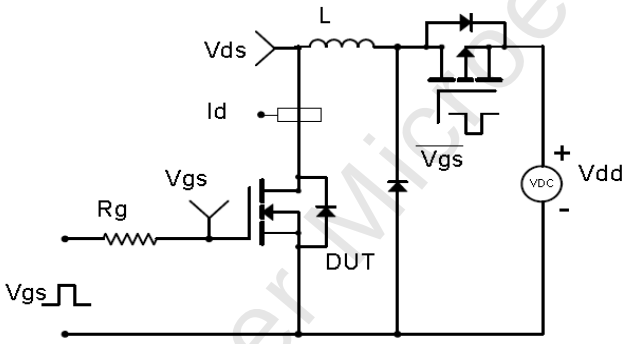


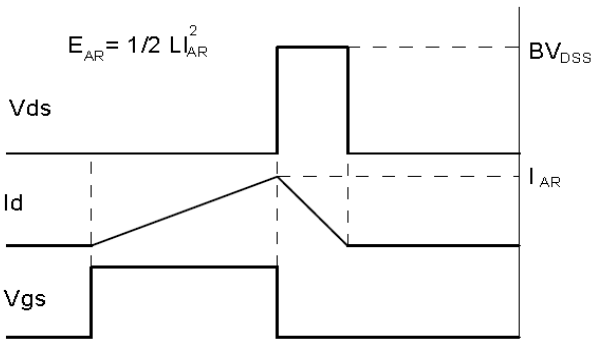
Resistive Switching Test Circuit & Waveforms



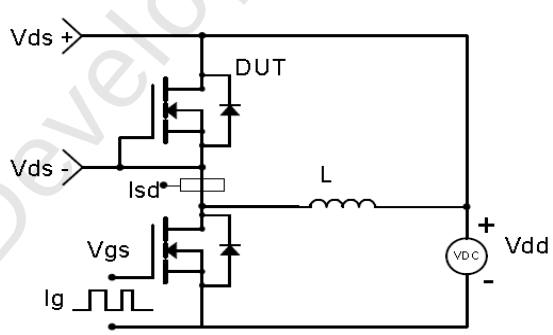


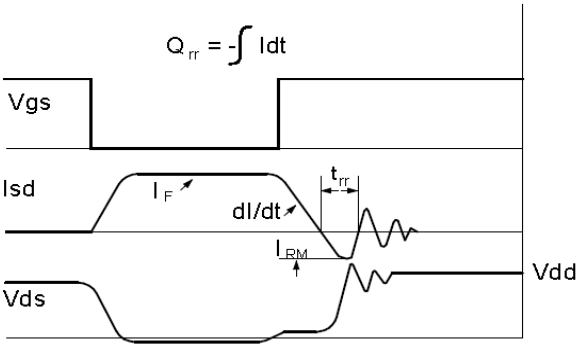
Unclamped Inductive Switching (UIS) Test Circuit & Waveforms



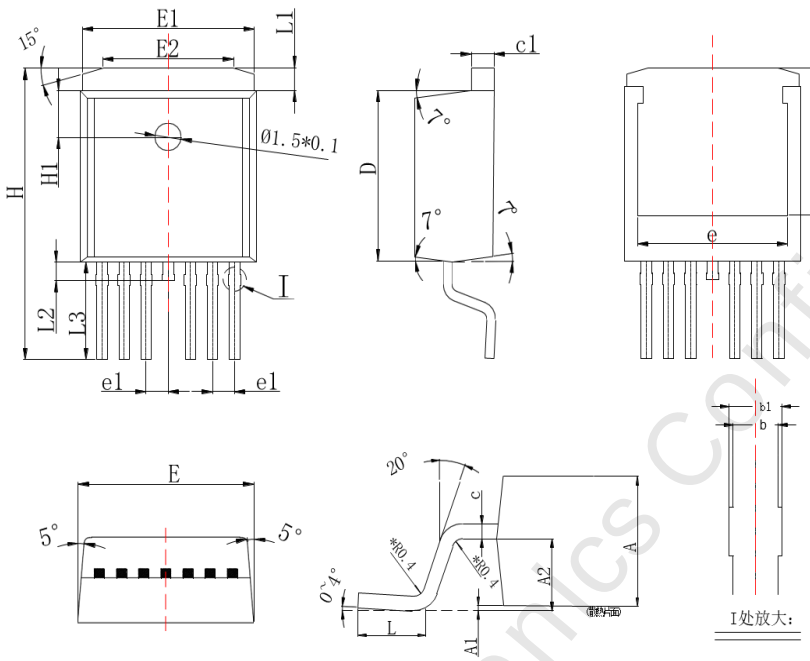


Diode Recovery Test Circuit & Waveforms



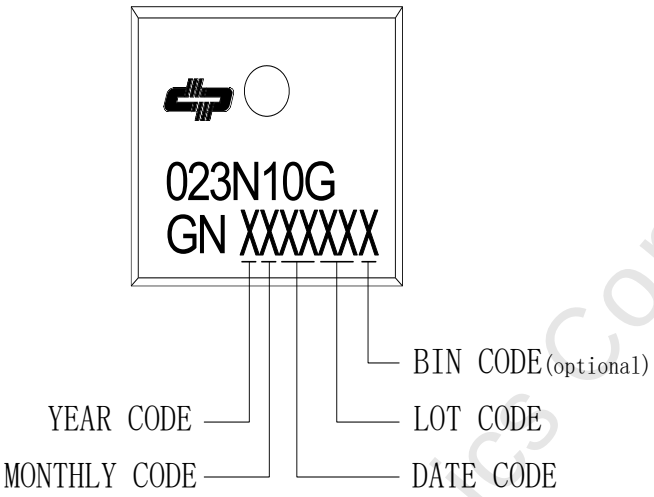


Package Outline: TO263-7L



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	4.52	4.62	0.178	0.182
A1	0.02	0.22	0.089	0.100
A2	2.34	2.67	0.028	0.036
b	0.5	0.7	0.352	0.384
b1	0.6	0.8	0.498	0.510
c	0.5	0.54	0.196	0.021
c1	1.25	1.35	0.047	0.055
D	9.1	9.2	0.390	0.404
D1	7.6	7.8	0.352	0.384
E	10	10.2	0.498	0.510
E1	9.85	9.91	0.196	0.390
E2	7.4	7.6	0.104	0.299
e	8.5	8.7	0.046	0.054
e1	1.17	1.37	0.013	0.026
H	15.3	15.7	0.047	0.055
H1	2.4	2.6	0.390	0.404
L	2.4	3	0.352	0.384
L1	0.85	1.15	0.498	0.510
L2	1.2	1.7	0.196	0.067
L3	4.85	5.45	0.104	0.215

Part Marking Information



Revision History

Revison	Major changes
1.0	Release for formal version

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