德普微电子
DEVELOPER MICROELECTRONICS

DP4901FTLCI

TRMOS N- and P-MOSFET 30V

Product Summary

DP4901FTLCI	V_{DS}	$R_{DS(on).typ}$ (@V_{GS}=10V)	$R_{DS(on).typ}$ (@V_{GS}=4.5V)	I_D
Q2	30V	4.5mΩ	6.6mΩ	61A
Q1	30V	6mΩ	8.9mΩ	42A

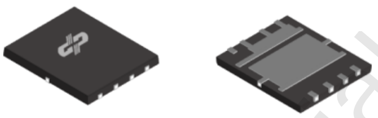
Features

- Uses advanced trench MOSFET technology
- Extremely low $R_{DS(on)}$/High Speed Power Switching
- Excellent Q_gx$R_{DS(on)}$ product(FOM)
- Qualified according to JEDEC criteria

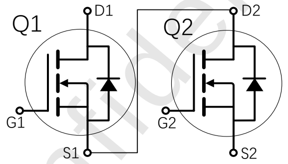
Applications

- PWM Applications
- Load Switch
- Power Management

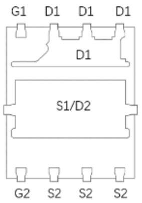
DFN 5x6-8c



Schematic diagram



Bottom view



Package Marking and Ordering Information

Part #	Marking	Package	Packing
DP4901FTLCI	4901FTLCI	DFN 5x6-8c	Reel/Tape

Halogen-Free

Absolute Maximum Ratings

Parameter	Symbol	Q1	Q2	Unit
Drain-source voltage	V_{DS}	30	30	V
Continuous drain current				
T_C = 25°C	I_D	42	61	A
T_C = 100°C		27	39	
Pulsed drain current (T_C = 25°C, t_p limited by T_{jmax})	$I_{D\ pulse}$	104	244	A
Avalanche energy, single pulse	E_{AS}	28	51	mJ
Gate-Source voltage	V_{GS}	±20	±20	V
Power dissipation (T_C = 25°C)	P_{tot}	24	43	W
Operating junction and storage temperature	T_j , T_{stg}	-55...+150	-55...+150	°C

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

Thermal Resistance

Parameter	Symbol	Q1	Q2	Unit
Thermal resistance, Junction-to-Case	R_{thJC}	5.2	3	°C/W
Thermal resistance, junction – ambient(min. footprint)	R_{thJA}	70	46	

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

Q1

Parameter	Symbol	Value			Unit	Test Condition
		min.	typ.	max.		
Static Characteristic						
Drain-source breakdown voltage	BV_{DSS}	30	-	-	V	V_{GS}=0V, I_D=250uA
Gate threshold voltage	$V_{GS(th)}$	1.2	-	2	V	V_{DS}=V_{GS},I_D=250uA
Zero gate voltage drain current	I_{DSS}	- -	- -	1 100	μA	V_{DS}=30V,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	$R_{DS(on)}$	-	6.0 8.9	7.5 12.0	mΩ	T_j=25°C V_{GS}=10V, I_D=20A V_{GS}=4.5V, I_D=16A
Gate resistance	R_g	-	1.2	-	Ω	V_{GS}=0V, V_{DS}=0V, f=1MHz
Dynamic Characteristic[2]						
Input Capacitance	C_{iss}	-	1104	-	pF	V_{GS}=0V, V_{DS}=15V, f=1MHz
Output Capacitance	C_{oss}	-	141	-		
Reverse Transfer Capacitance	C_{rss}	-	115	-		
Gate Total Charge	Q_g	-	23	-	nC	V_{GS}=10V, V_{DS}=15V, I_D=20A, f=1MHz
Gate-Source charge	Q_{gs}	-	5.5	-		
Gate-Drain charge	Q_{gd}	-	4.5	-		
Turn-on delay time	$t_{d(on)}$	-	6	-	ns	V_{GS}=10V, V_{DD}=15V, R_{G_ext}=2.7Ω
Rise time	t_r	-	27	-		
Turn-off delay time	$t_{d(off)}$	-	18	-		
Fall time	t_f	-	8.6	-		

Body Diode Characteristic

Parameter	Symbol	Value			Unit	Test Condition
		min.	typ.	max.		
Body Diode Forward Voltage	V_{SD}	-	0.88	1.2	V	V_{GS}=0V,I_{SD}=20A
Body Diode Reverse Recovery Time[2]	t_{rr}	-	9.2	-	ns	I_F=20A, dI/dt=100A/μs
Body Diode Reverse Recovery Charge[2]	Q_{rr}	-	3.4	-	nC	

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

Q2

Parameter	Symbol	Value			Unit	Test Condition
		min.	typ.	max.		
Static Characteristic						
Drain-source breakdown voltage	BV_{DSS}	30	-	-	V	V_{GS}=0V, I_D=250uA
Gate threshold voltage	$V_{GS(th)}$	1.2	-	2	V	V_{DS}=V_{GS},I_D=250uA
Zero gate voltage drain current	I_{DSS}	- -	- -	1 100	µA	V_{DS}=30V,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 6.6	5.6 8.6	mΩ	T_j=25°C V_{GS}=10V, I_D=20A V_{GS}=-4.5V, I_D=16A
Gate resistance	R_g	-	2.3	-	Ω	V_{GS}=0V, V_{DS}=0V, f=1MHz
Dynamic Characteristic[2]						
Input Capacitance	C_{iss}	-	4061	-	pF	V_{GS}=0V, V_{DS}=15V, f=1MHz
Output Capacitance	C_{oss}	-	448	-		
Reverse Transfer Capacitance	C_{rss}	-	289	-		
Gate Total Charge	Q_g	-	82	-	nC	V_{GS}=10V, V_{DS}=15V, I_D=20A, f=1MHz
Gate-Source charge	Q_{gs}	-	19	-		
Gate-Drain charge	Q_{gd}	-	13.5	-		
Turn-on delay time	$t_{d(on)}$	-	16	-	ns	V_{GS}=10V, V_{DD}=15V, R_{G_ext}=2.7Ω
Rise time	t_r	-	80	-		
Turn-off delay time	$t_{d(off)}$	-	66	-		
Fall time	t_f	-	75	-		

Body Diode Characteristic

Parameter	Symbol	Value			Unit	Test Condition
		min.	typ.	max.		
Body Diode Forward Voltage	V_{SD}	-	0.9	1.2	V	V_{GS}=0V,I_{SD}=20A
Body Diode Reverse Recovery Time[2]	t_{rr}	-	15	-	ns	I_F=20A, dI/dt=100A/µs
Body Diode Reverse Recovery Charge[2]	Q_{rr}	-	2.2	-	nC	

Typical Performance Characteristics

Q1

Fig 1: Output Characteristics

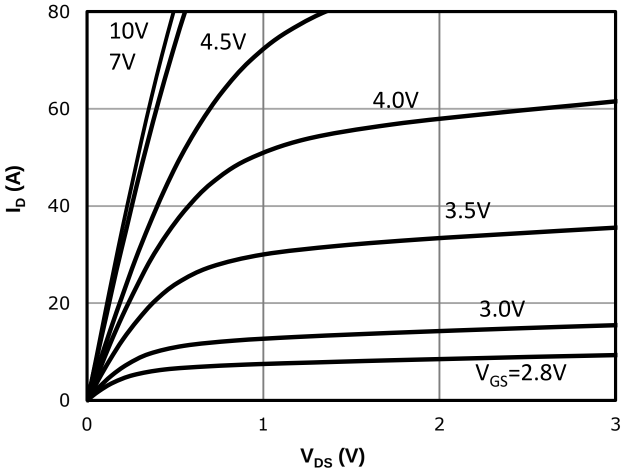


Fig 2: Transfer Characteristics

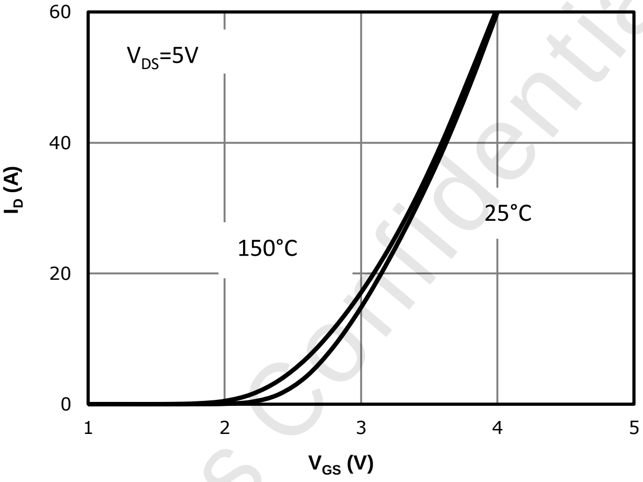


Fig 3: Rds(on) vs Drain Current and Gate Voltage

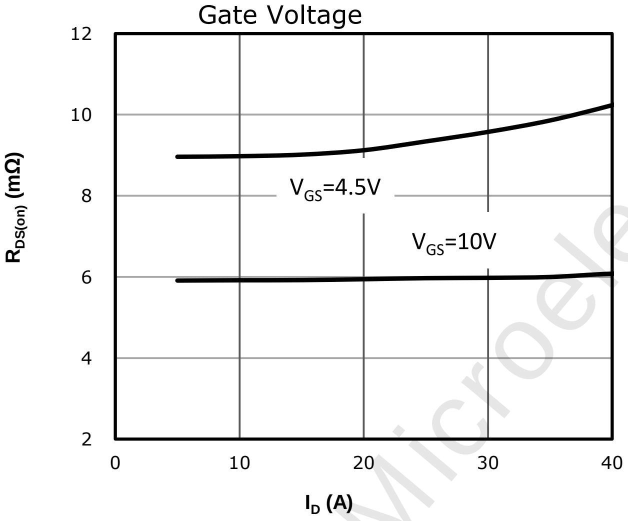


Fig 4: Rds(on) vs Gate Voltage

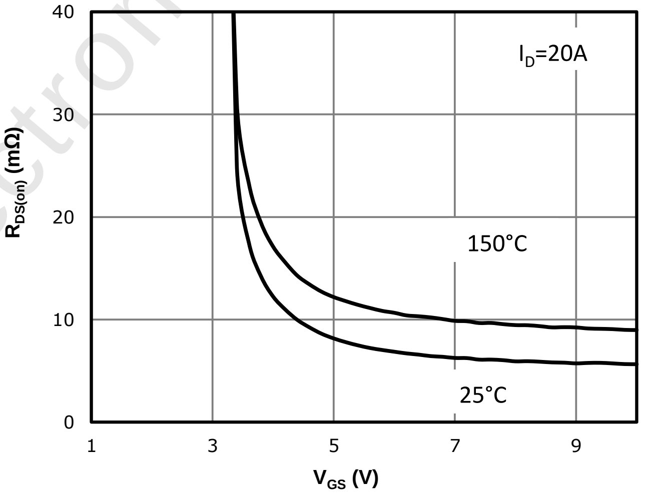


Fig 5: Rds(on) vs. Temperature

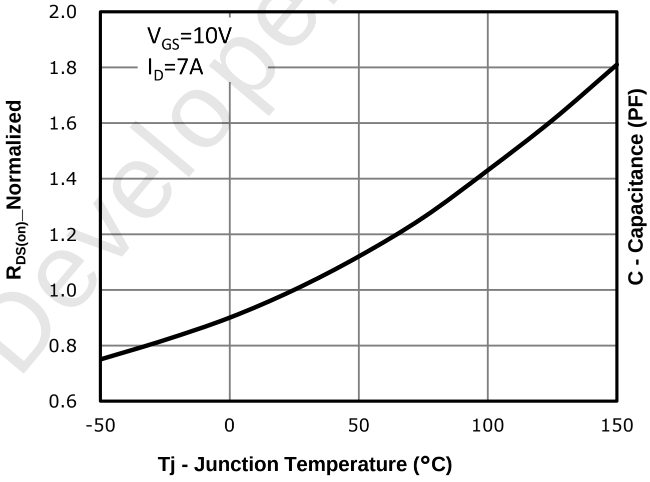
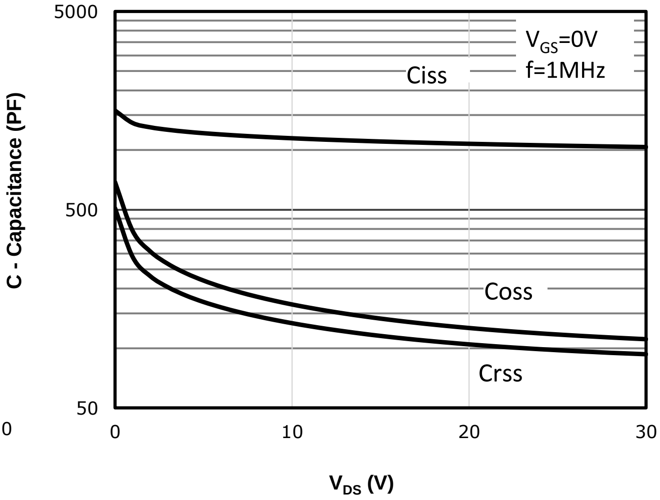


Fig 6: Capacitance Characteristics



Q2

Fig 1: Output Characteristics

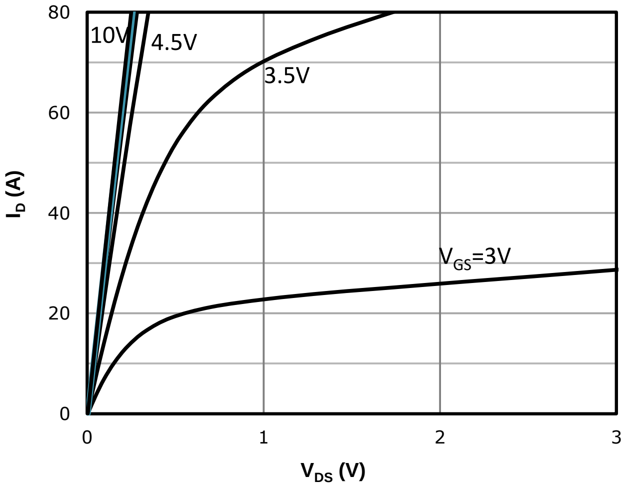


Fig 2: Transfer Characteristics

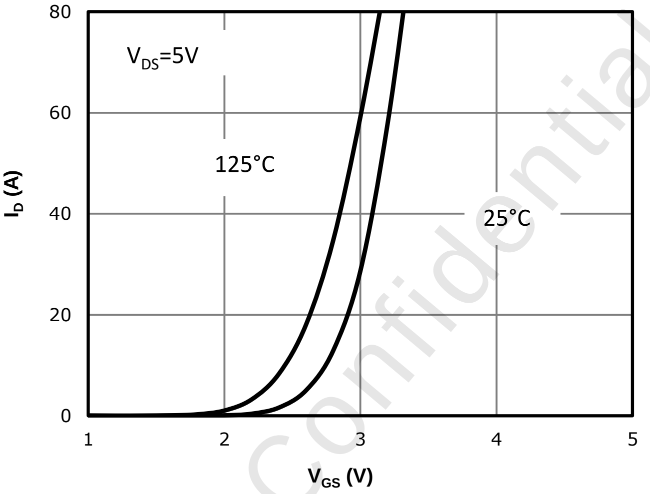


Fig 3: Rds(on) vs Drain Current and Gate Voltage

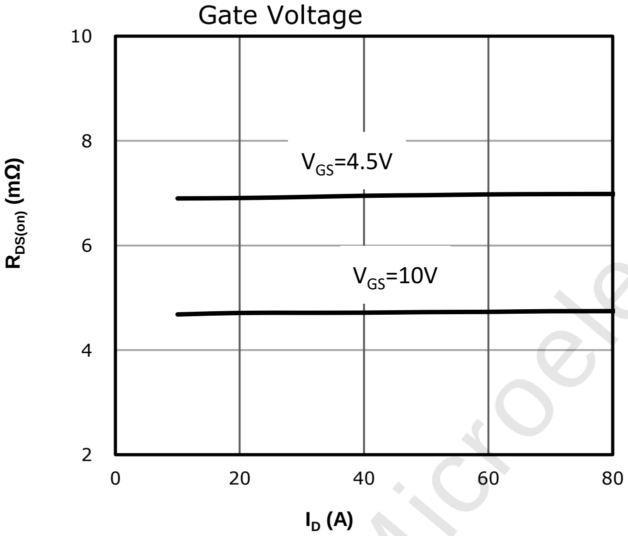


Fig 4: Rds(on) vs Gate Voltage

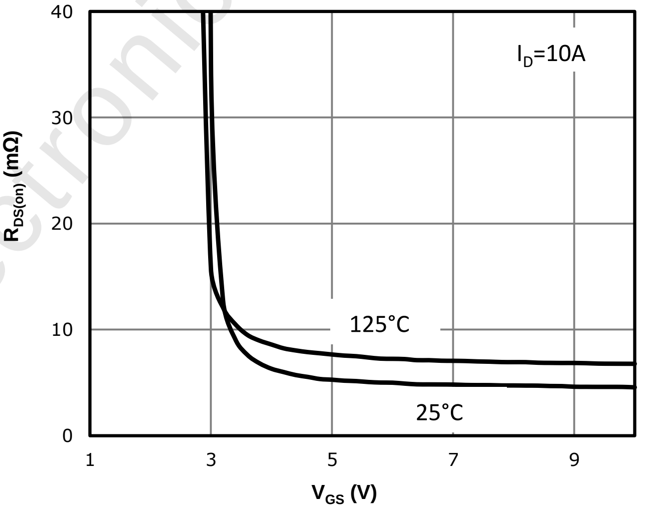


Fig 5: Rds(on) vs. Temperature

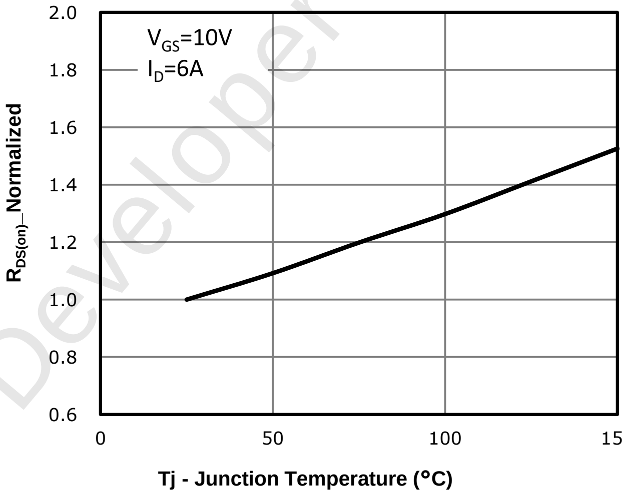
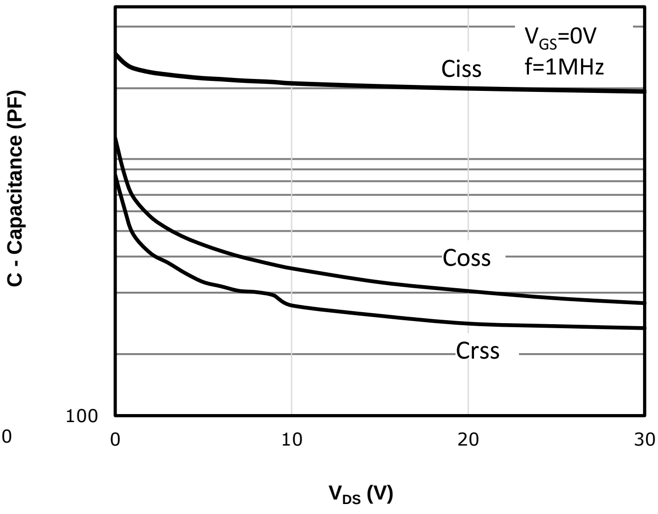
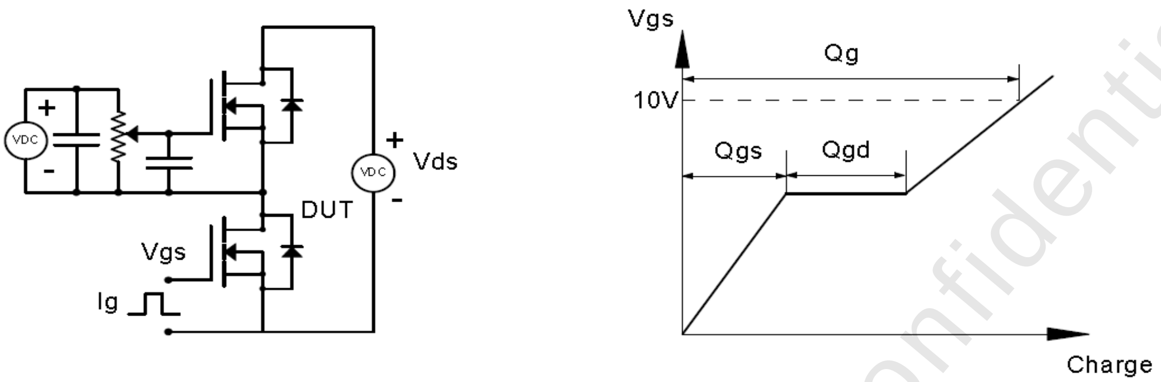


Fig 6: Capacitance Characteristics

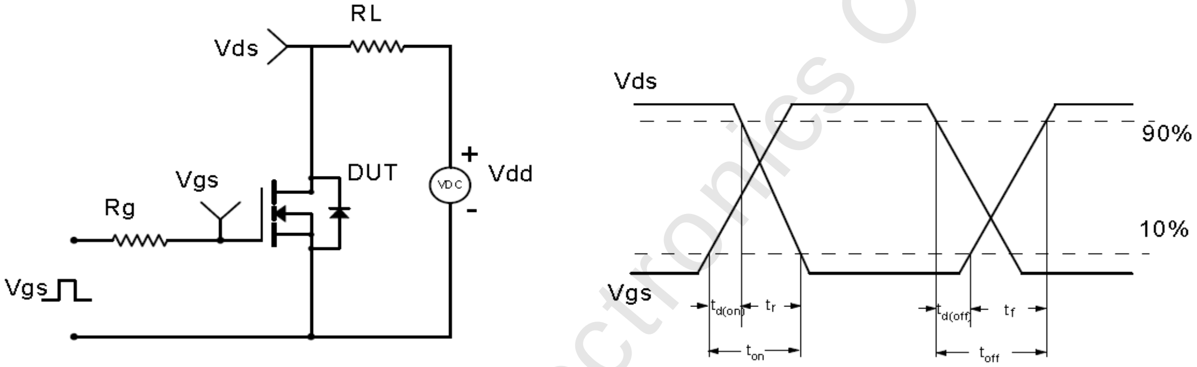


Test Circuit & Waveform

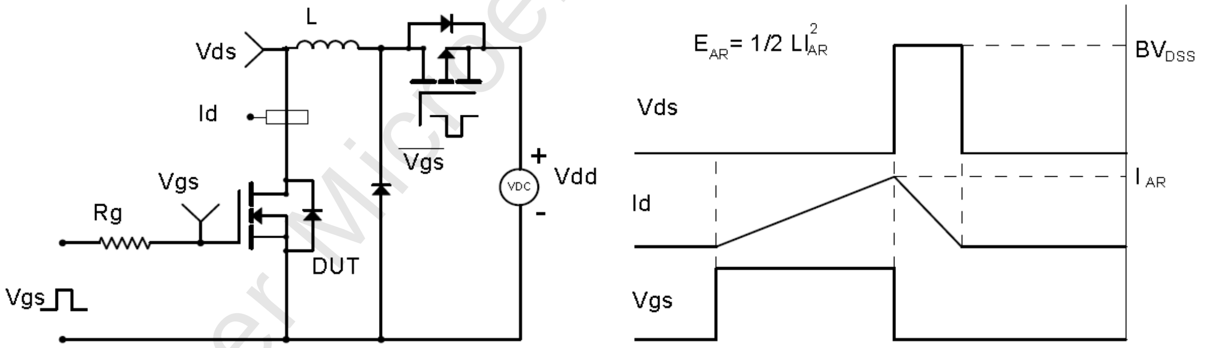
Gate Charge Test Circuit & Waveform



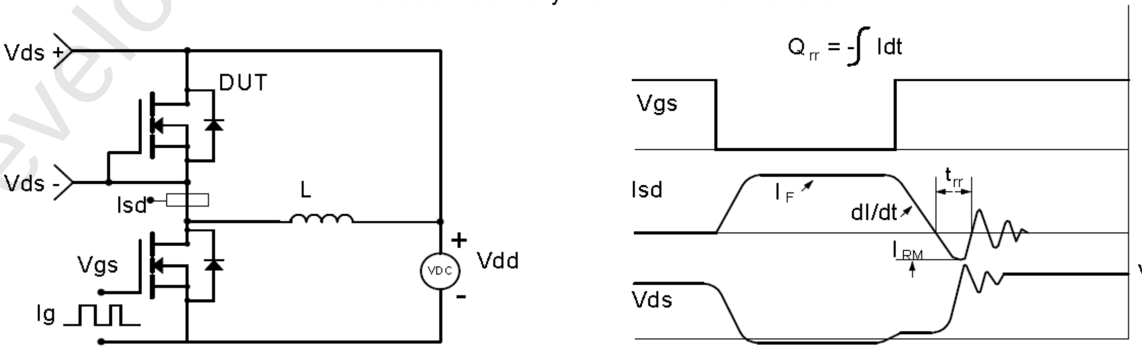
Resistive Switching Test Circuit & Waveforms



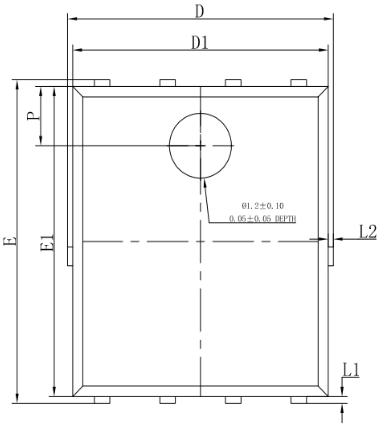
Unclamped Inductive Switching (UIS) Test Circuit & Waveforms



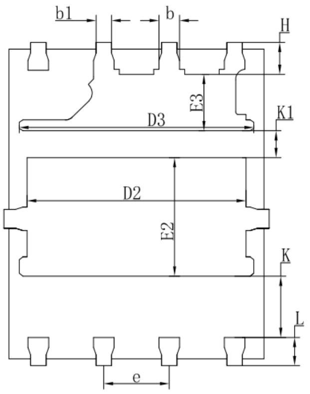
Diode Recovery Test Circuit & Waveforms



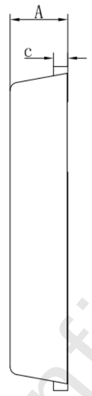
Package Outline: PDFN5X6-8C



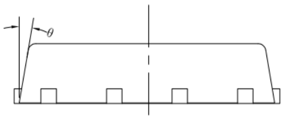
TOP VIEW



BOTTOM VIEW



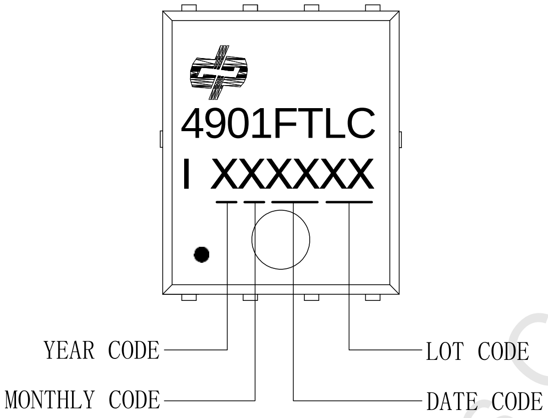
SIDE VIEW



SIDE VIEW

Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	1.00	1.20	0.039	0.047
D	-	5.10	-	0.201
D1	4.90	5.00	0.193	0.197
D2	4.15	4.35	0.163	0.171
D3	4.45	4.65	0.175	0.183
E	5.90	6.10	0.232	0.240
E1	5.70	5.80	0.224	0.228
E2	2.10	2.30	0.083	0.091
E3	0.95	1.15	0.037	0.045
H	0.50	0.70	0.020	0.028
b	0.35	0.45	0.014	0.018
b1	0.25	0.35	0.010	0.014
c	0.21	0.34	0.008	0.013
e	1.17	1.37	0.046	0.054
K	1.05	1.25	0.041	0.049
K1	0.40	0.60	0.016	0.024
L	0.45	0.65	0.018	0.026
L1	0.06	0.20	0.002	0.008
L2	-	0.15	-	0.006
P	1.00	1.20	0.039	0.047
θ	8°	12°	-	-

Part Marking Information



Revision History

Revison	Major changes
1.05	Release for formal version

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