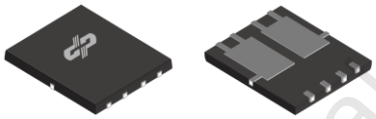
DP050N03FTLB

TRMOS N-MOSFET 30V, 4.7mΩ, 60A

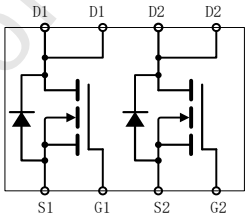
Product Summary

Part #	V_{DS}	$R_{DS(on).typ}$ (@V_{GS}=10V)	$R_{DS(on).typ}$ (@V_{GS}=4.5V)	I_D
DP050N03FTLB	30V	4.7mΩ	5.8mΩ	60A

DFN 5x6-8



Top view



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
DP050N03FTLB	050N03FTLB	DFN 5x6-8	Tape/Reel

Halogen-Free

Absolute Maximum Ratings

Parameter	Symbol	Value	Unit
Drain-source voltage	V_{DS}	30	V
Continuous drain current T_C = 25°C T_C = 100°C	I_D	 60 38	A
Pulsed drain current (T_C = 25°C, t_p limited by T_{jmax})	$I_{D\ pulse}$	240	A
Avalanche energy, single pulse (l=0.3mH, Rg=25)[1]	E_{AS}	86	mJ
Gate-Source voltage	V_{GS}	±20	V
Power dissipation (T_C = 25°C)	P_{tot}	22	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}	6	°C/W
Thermal resistance, junction – ambient(min. footprint)	R_{thJA}	75	

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}	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	μA	V_{DS}=30V,V_{GS}=0V T_j=25°C
		-	-	100		T_j=150°C
Gate-source leakage current	I_{GSS}	-	-	±100	nA	V_{GS}=±20V,V_{DS}=0V
Drain-source on-state resistance	$R_{DS(on)}$	-	4.7	5.6	mΩ	T_j=25°C V_{GS}=10V, I_D=15A
		-	5.8	7.6	mΩ	V_{GS}=4.5V, I_D=12A
Gate resistance	R_g	-	1.7	5	Ω	V_{GS}=0V, V_{DS}=0V, f=1MHz
Transconductance[2]	g_{fs}	-	90	-	S	V_{DS}=5V,I_D=40A
Dynamic Characteristic[2]						
Input Capacitance	C_{iss}	-	2278	-	pF	V_{GS}=0V, V_{DS}=15V, f=1MHz
Output Capacitance	C_{oss}	-	284	-		
Reverse Transfer Capacitance	C_{rss}	-	270	-		
Gate Total Charge(V_{GS}=10V)	Q_g	-	54	-	nC	V_{GS}=10V, V_{DS}=15V, I_D=20A, f=1MHz
Gate Total Charge(V_{GS}=4.5V)	Q_g	-	27	-		
Gate-Source charge	Q_{gs}	-	9.7	-		
Gate-Drain charge	Q_{gd}	-	11	-		
Turn-on delay time	$t_{d(on)}$	-	5.7	-	ns	V_{GS}=10V, V_{DD}=15V, R_{G_ext}=2.7Ω
Rise time	t_r	-	30	-		
Turn-off delay time	$t_{d(off)}$	-	38	-		
Fall time	t_f	-	16	-		

Body Diode Characteristic

Parameter	Symbol	Value			Unit	Test Condition
		min.	typ.	max.		
Body Diode Forward Voltage	V_{SD}	-	-	1.2	V	V_{GS}=0V,I_{SD}=20A
Diode continuous forward current	I_s	-	-	60	A	TC = 25°C
Diode pluse current	$I_{s\ pluse}$	-	-	240	A	TC = 25°C
Body Diode Reverse Recovery Time[2]	t_{rr}	-	12	-	ns	I_F=20A, dI/dt=100A/μs
Body Diode Reverse Recovery Charge[2]	Q_{rr}	-	2.4	-	nC	

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

Typical Performance Characteristics

Fig 1: Output Characteristics

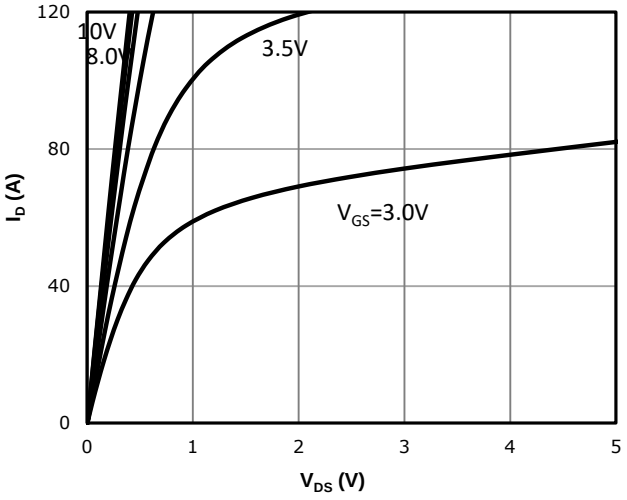


Fig 2: Transfer Characteristics

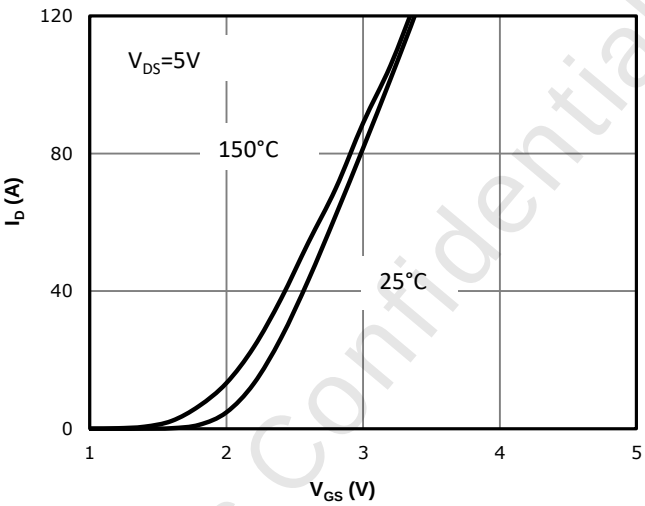


Fig 3: Rds(on) vs Drain Current and Gate Voltage

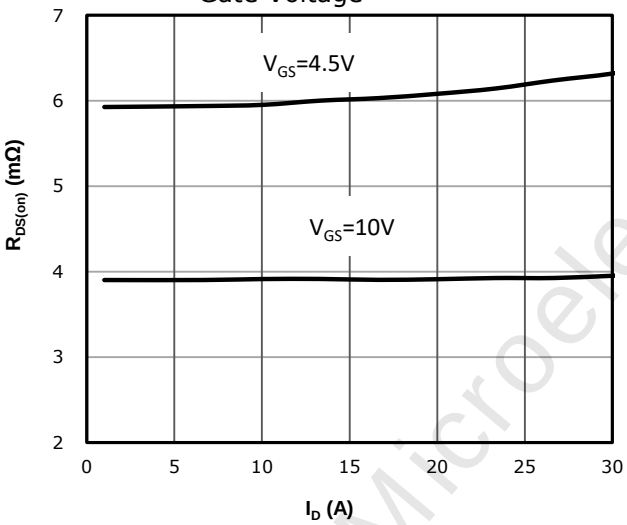


Fig 4: Rds(on) vs Gate Voltage

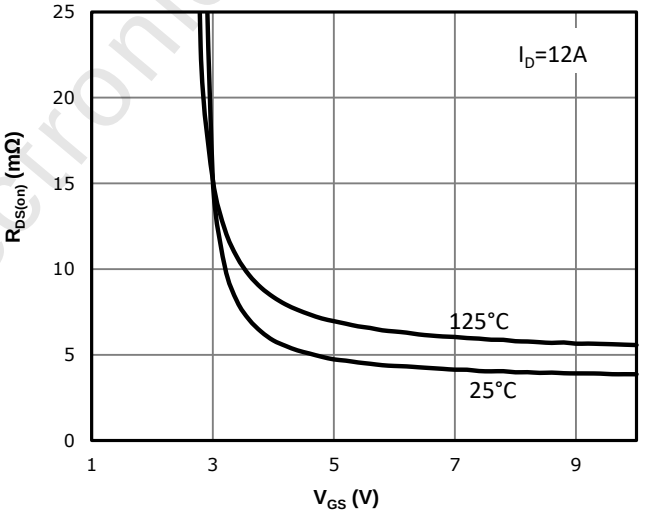


Fig 5: Rds(on) vs. Temperature

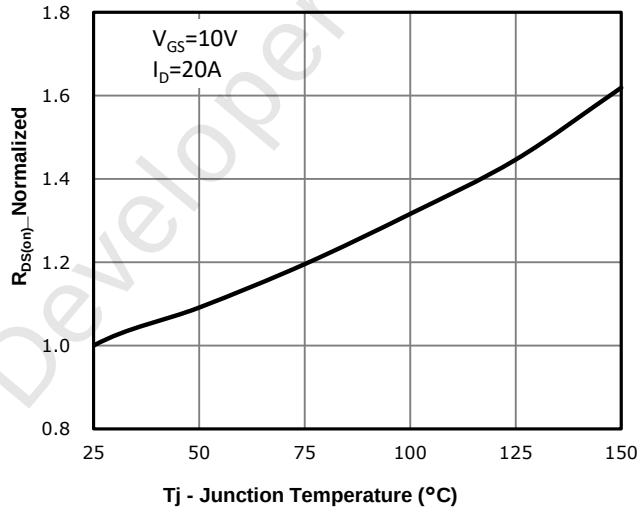


Fig 6: Capacitance Characteristics

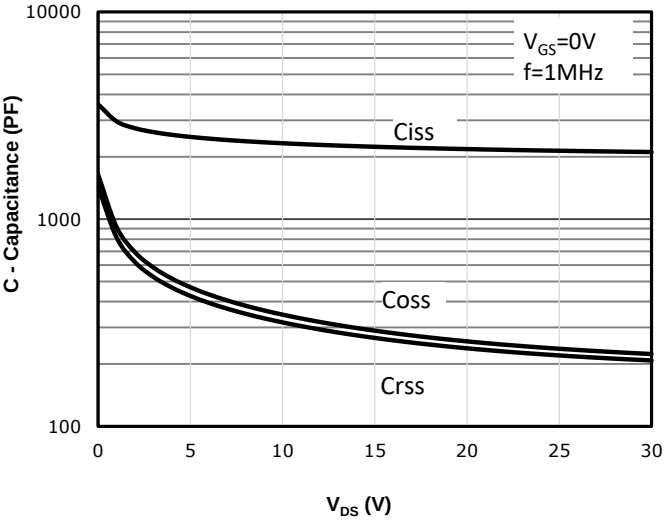


Fig 7: Gate Charge Characteristics

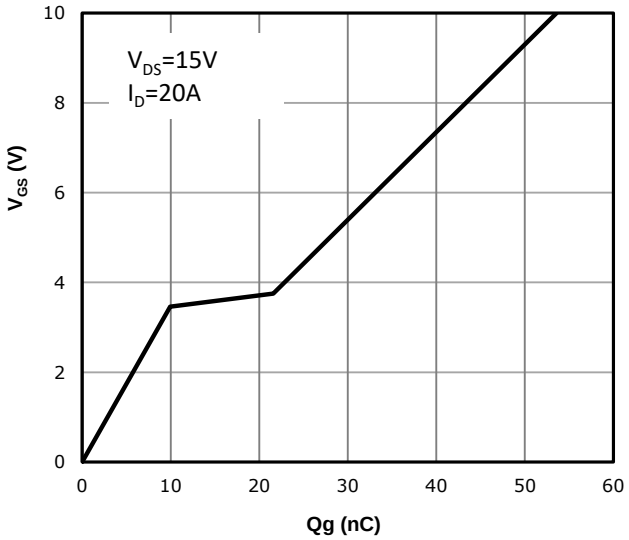


Fig 8: Body-diode Forward Characteristics

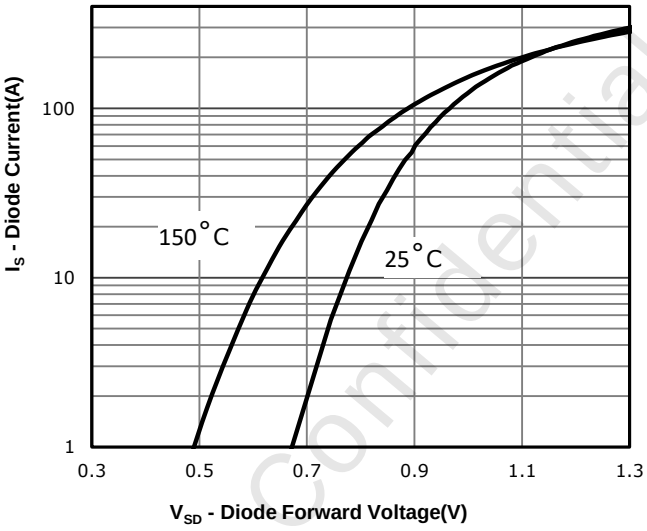


Fig 9: Power Dissipation

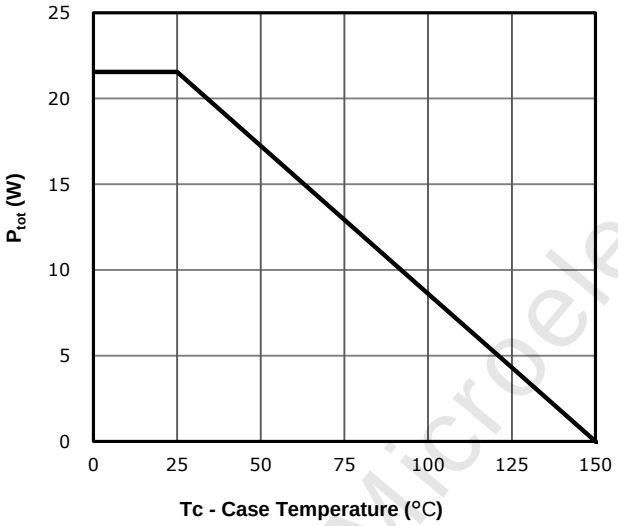


Fig 10: Drain Current Derating

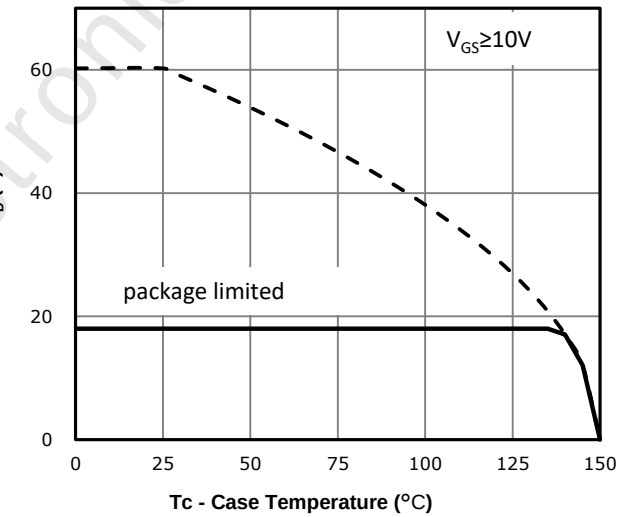


Fig 11: Safe Operating Area

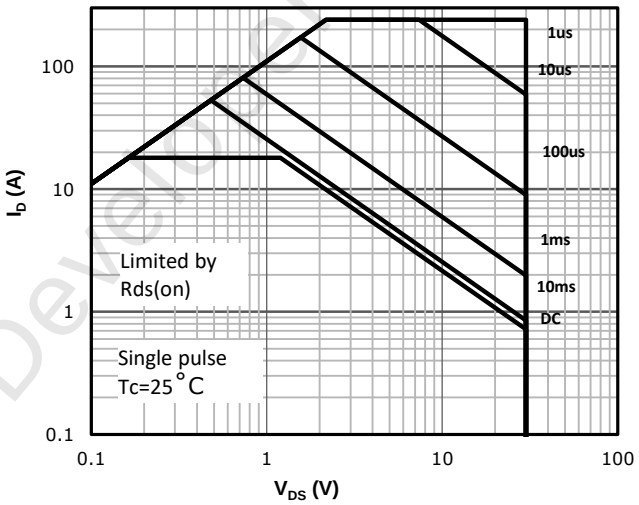
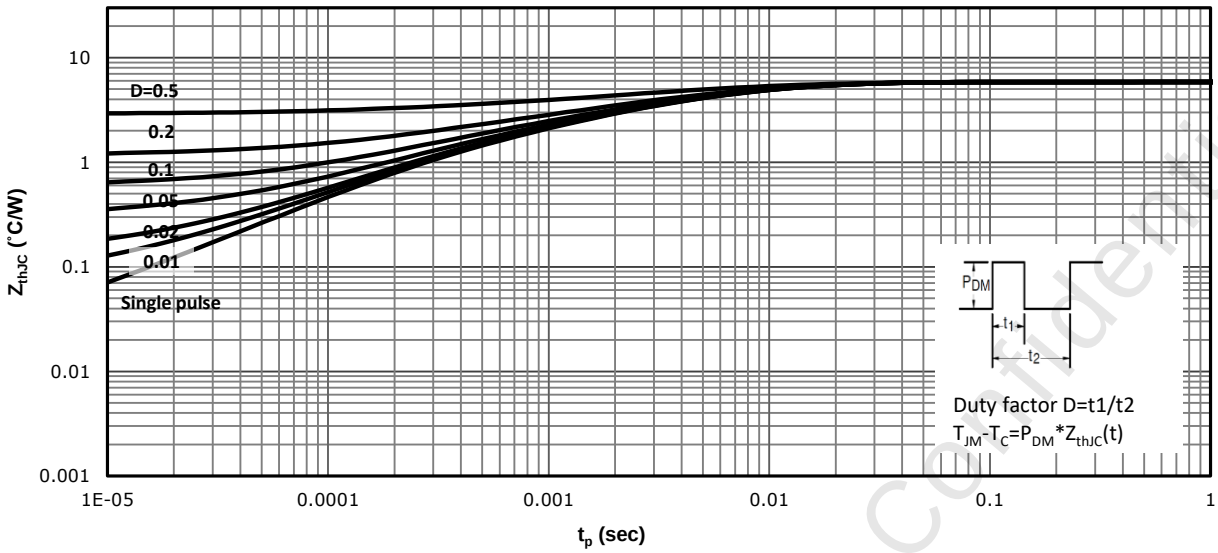
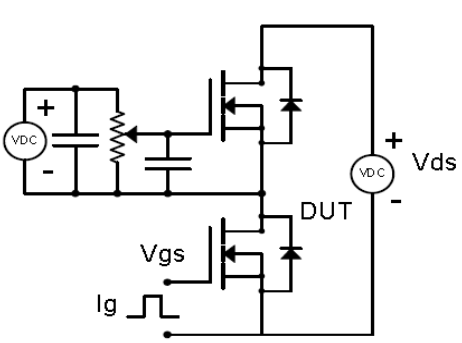


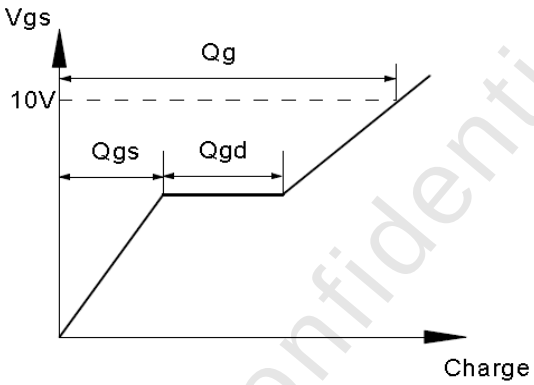
Fig 12: Max. Transient Thermal Impedance



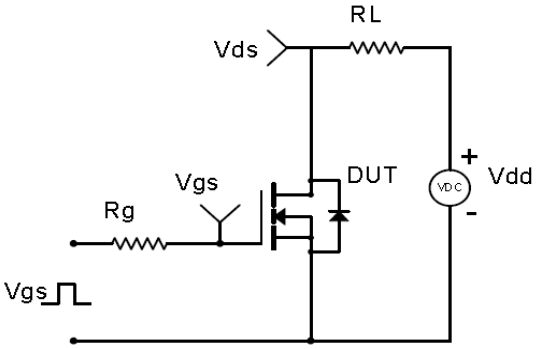
Test Circuit & Waveform

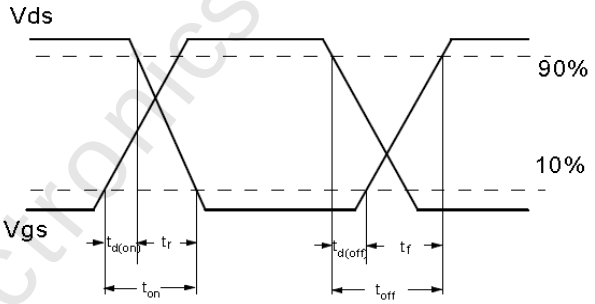
Gate Charge Test Circuit & Waveform



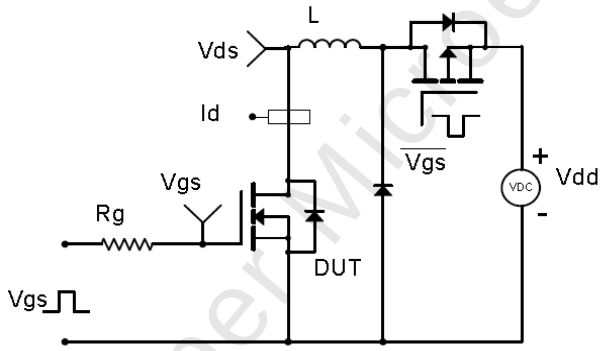


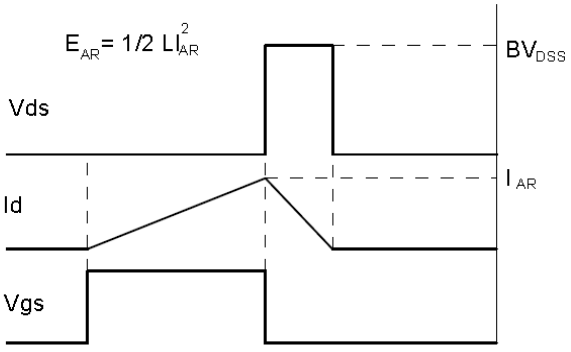
Resistive Switching Test Circuit & Waveforms



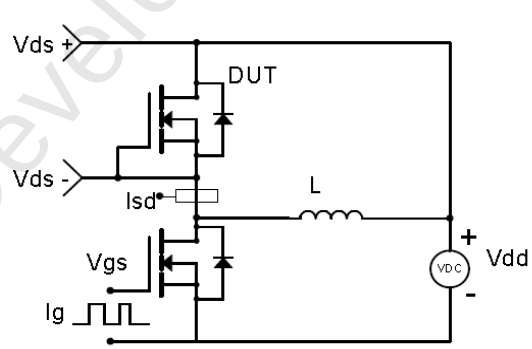


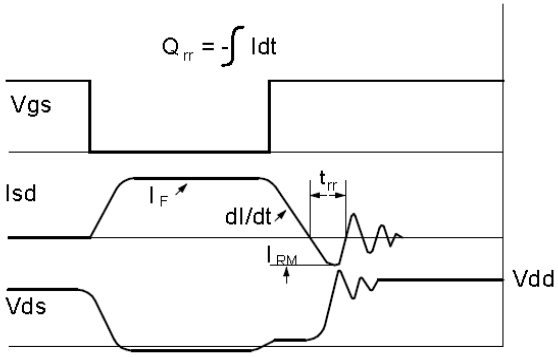
Unclamped Inductive Switching (UIS) Test Circuit & Waveforms



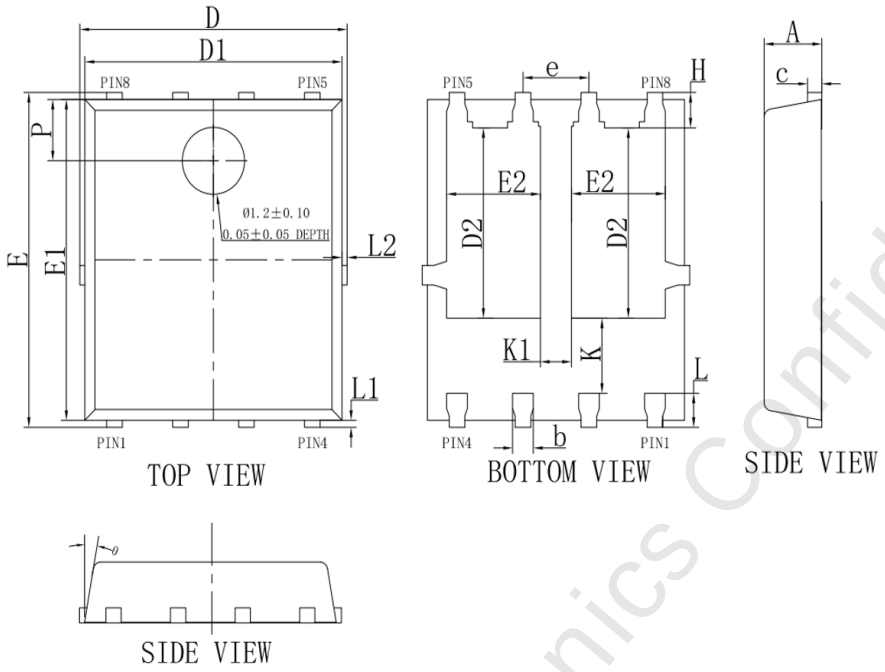


Diode Recovery Test Circuit & Waveforms



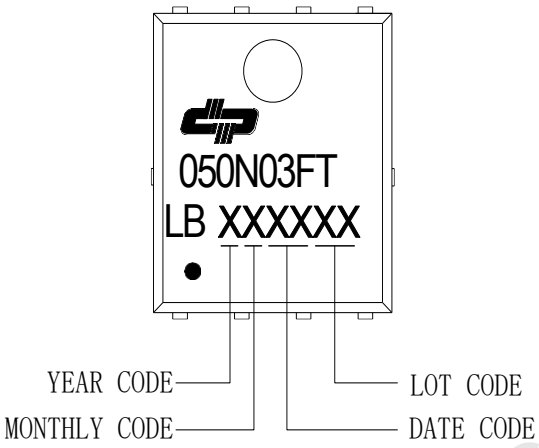


Package Outline: PDFN5X6-8



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	3.31	3.51	0.130	0.138
E	5.90	6.10	0.232	0.240
E1	5.70	5.80	0.224	0.228
E2	1.71	1.91	0.067	0.075
H	0.51	0.71	0.020	0.028
b	0.35	0.45	0.014	0.018
c	0.21	0.34	0.008	0.013
e	1.17	1.37	0.046	0.054
K	1.25	1.45	0.049	0.057
K1	0.50	0.70	0.020	0.028
L2	0.51	0.71	0.020	0.028
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
1.1	Release for formal version

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