

Product Summary

Part #	V _{DS}	R _{DS(on).typ} (@V _{GS} =10V)	R _{DS(on).typ} (@V _{GS} =4.5V)	I _D
DP058N03FGLB	30V	5.6mΩ	7.2mΩ	24A

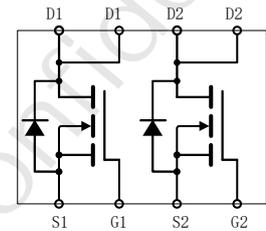
Features

- Uses advanced MOSFET-DPMOS technology
- Extremely low on-resistance R_{DS(on)}
- Excellent Q_gxR_{DS(on)} product(FOM)
- Qualified according to JEDEC criteria

Applications

- Networking DC-DC Power System
- Battery management
- Load Switch

DFN 5x6-8



100% Avalanche Tested

 100% R_g Tested

Package Marking and Ordering Information

Part #	Marking	Package	Packing
DP058N03FGLB	058N03FGLB	DFN 5x6-8	Tape&Reel


Absolute Maximum Ratings

Parameter	Symbol	Value	Unit
Drain-source voltage	V _{DS}	30	V
Continuous drain current	I _D	41	A
T _C = 25°C		24	
T _C = 25°C (Package limit)		27	
Pulsed drain current (T _C = 25°C, t _p limited by T _{jmax})	I _{D pulse}	96	A
Avalanche energy, single pulse (L=0.3mH, R _g =25Ω) ^[1]	E _{AS}	42	mJ
Gate-Source voltage	V _{GS}	±20	V
Power dissipation (T _C = 25°C)	P _{tot}	23	W
Operating junction and storage temperature	T _j , T _{stg}	-55...+150	°C

[1].EAS is tested at starting T_j = 25°C, V_{GS} = 10V. data shows Max. rating

Thermal Resistance

Parameter	Symbol	Max	Unit
Thermal resistance, junction – case.	R_{thJC}	6	°C/W
Thermal resistance, junction – ambient(min. footprint)	R_{thJA}	55	

Electrical Characteristic (at $T_j = 25\text{ }^\circ\text{C}$, unless otherwise specified)

Parameter	Symbol	Value			Unit	Test Condition
		min.	typ.	max.		

Static Characteristic

Drain-source breakdown voltage	BV_{DSS}	30	-	-	V	$V_{GS}=0V, I_D=250\mu A$
Gate threshold voltage	$V_{GS(th)}$	1	-	3	V	$V_{DS}=V_{GS}, I_D=250\mu A$
Zero gate voltage drain current	I_{DSS}	-	-	1	μA	$V_{DS}=30V, V_{GS}=0V$ $T_j=25^\circ C$ $T_j=125^\circ C$
Gate-source leakage current	I_{GSS}	-	± 10	± 100	nA	$V_{GS}=\pm 20V, V_{DS}=0V$
Drain-source on-state resistance	$R_{DS(on)}$	-	5.6	6.5	mΩ	$V_{GS}=10V, I_D=15A$ $V_{GS}=4.5V, I_D=12A$
Gate resistance	R_g	-	1.3	3	Ω	$V_{GS}=0V, V_{DS}=0V,$ $f=1MHz$
Transconductance ^[2]	g_{fs}	-	72	-	S	$V_{DS}=5V, I_D=15A$

Dynamic Characteristic^[2]

Input Capacitance	C_{iss}	-	633	-	pF	$V_{GS}=0V, V_{DS}=15V,$ $f=1MHz$
Output Capacitance	C_{oss}	-	195	-		
Reverse Transfer Capacitance	C_{rss}	-	12	-		
Gate Total Charge (10V)	Q_g	-	11	-	nC	$V_{GS}=10V, V_{DS}=15V,$ $I_D=15A, f=1MHz$
Gate Total Charge (4.5V)	Q_g	-	4.5	-		
Gate-Source charge	Q_{gs}	-	3.1	-		
Gate-Drain charge	Q_{gd}	-	1.2	-		
Turn-on delay time	$t_{d(on)}$	-	4	-	ns	$V_{GS}=10V, V_{DD}=15V,$ $R_{G_ext}=2.7\Omega$
Rise time	t_r	-	25	-		
Turn-off delay time	$t_{d(off)}$	-	12	-		
Fall time	t_f	-	6	-		

Body Diode Characteristic

Parameter	Symbol	Value			Unit	Test Condition
		min.	typ.	max.		
Body Diode Forward Voltage	V_{SD}	-	0.8	1.3	V	$V_{GS}=0V, I_{SD}=15A$
Diode continuous forward current	I_S	-	-	24	A	$TC = 25^{\circ}C$
Diode pluse current	$I_{S\ pluse}$	-	-	96	A	$TC = 25^{\circ}C$
Body Diode Reverse Recovery Time ^[2]	t_{rr}	-	11	-	ns	$I_F=15A, dI/dt=100A/\mu s$
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

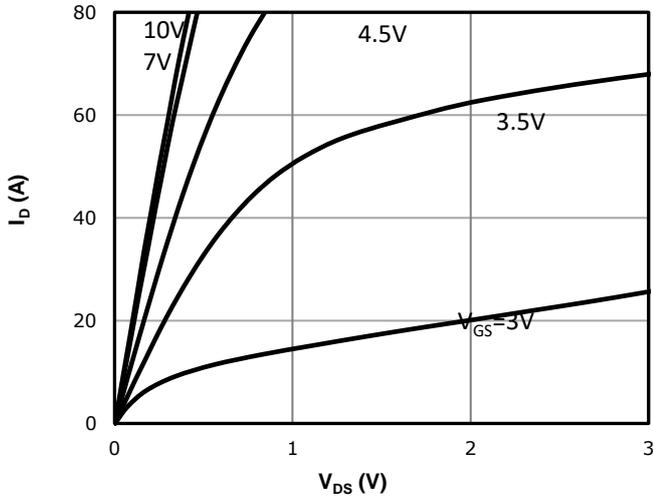


Fig 2: Transfer Characteristics

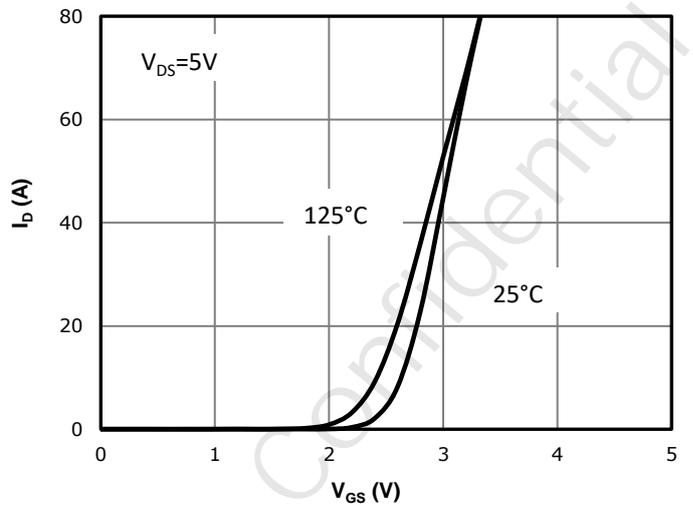


Fig 3: $R_{DS(on)}$ vs Drain Current and Gate Voltage

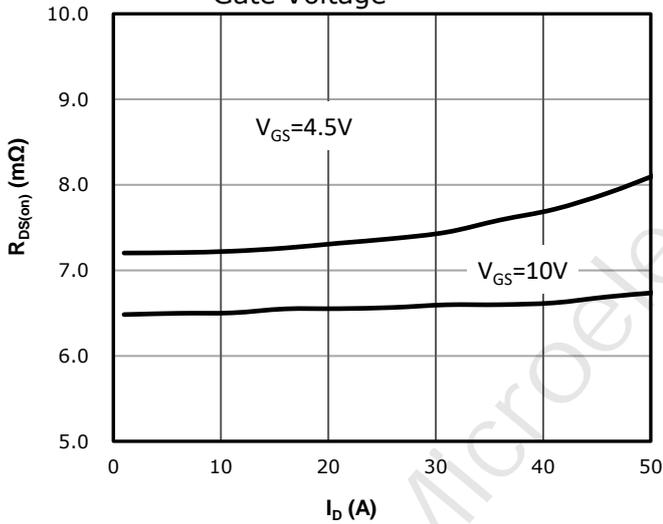


Fig 4: $R_{DS(on)}$ vs Gate Voltage

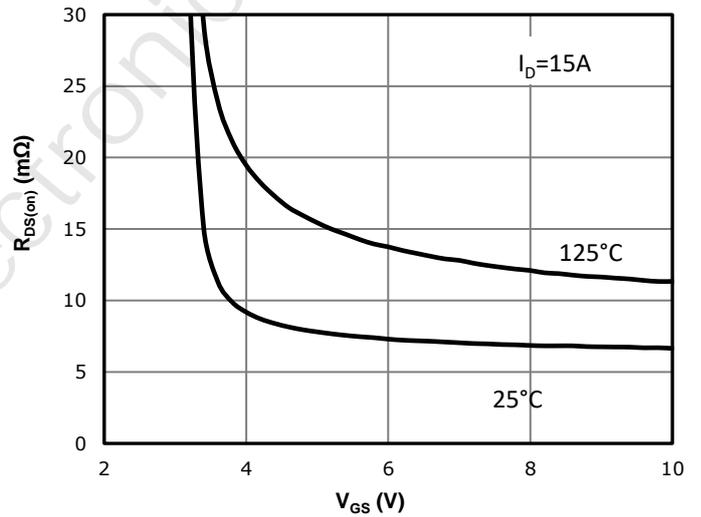


Fig 5: $R_{DS(on)}$ vs. Temperature

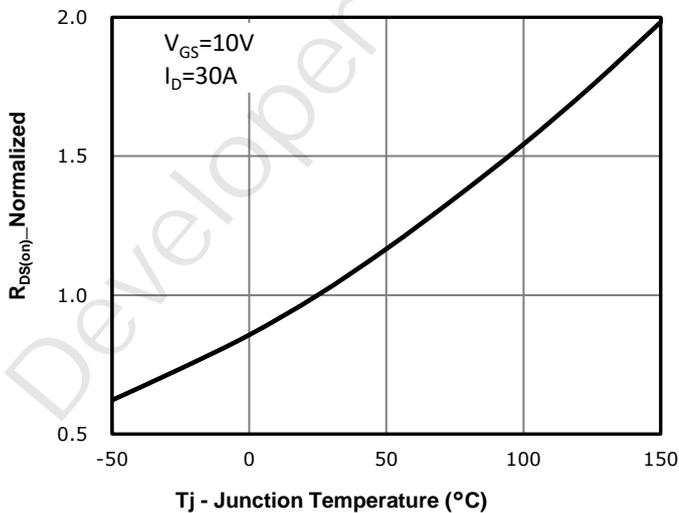


Fig 6: Capacitance Characteristics

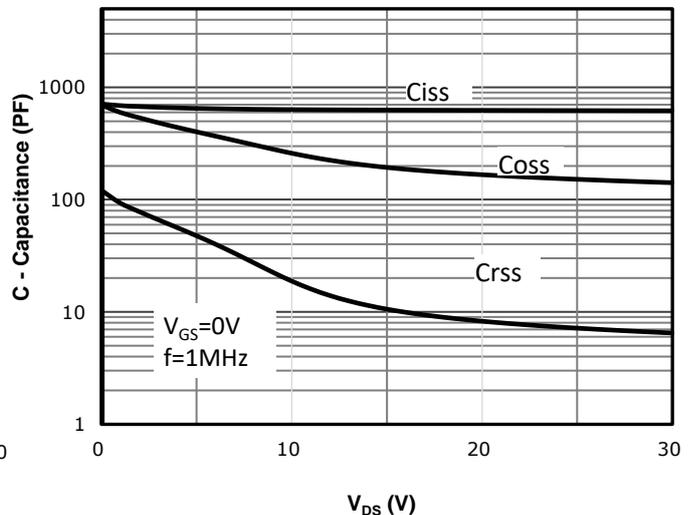


Fig 7: Gate Charge Characteristics

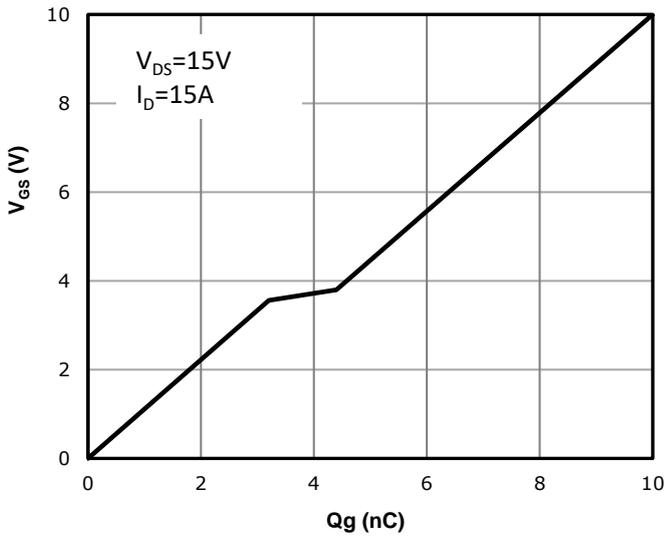


Fig 8: Body-diode Forward Characteristics

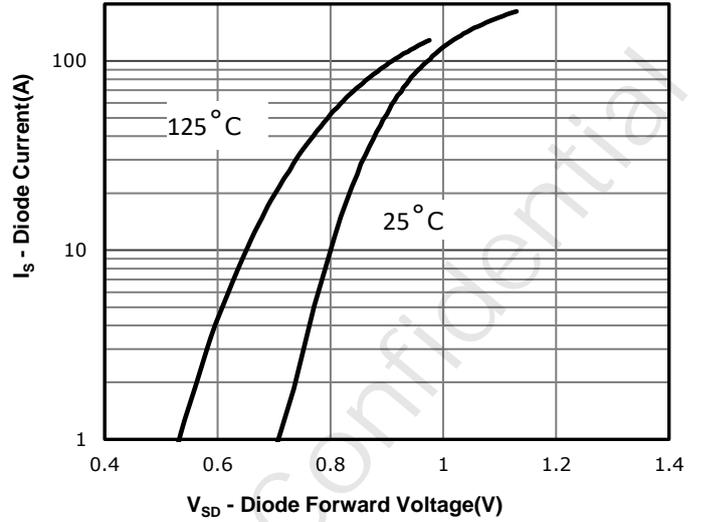


Fig 9: Power Dissipation

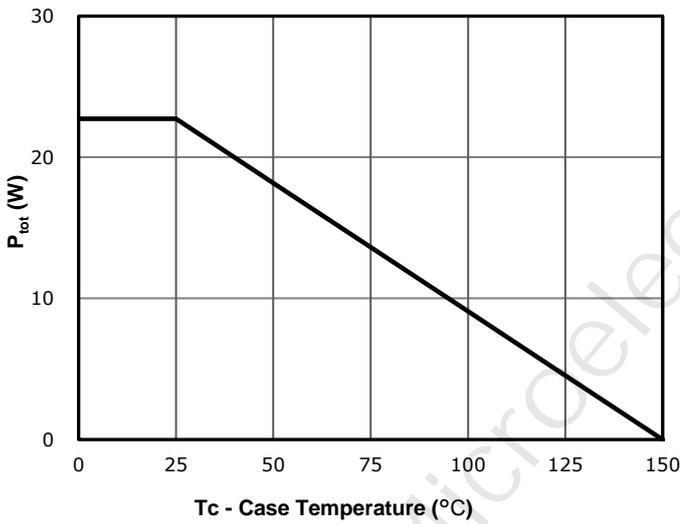


Fig 10: Drain Current Derating

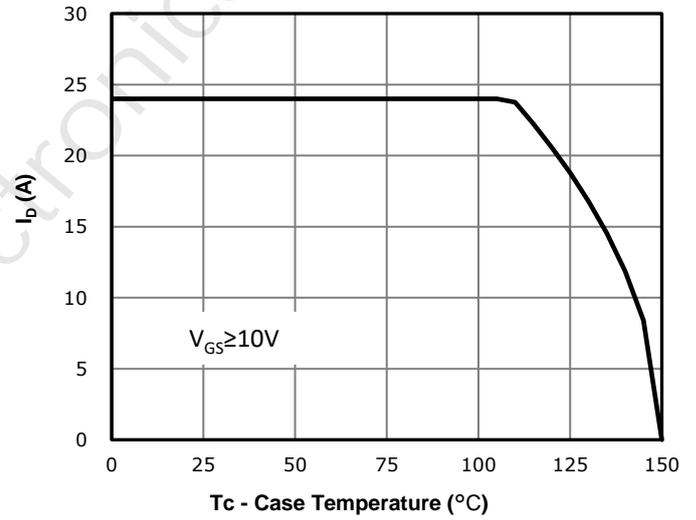


Fig 11: Safe Operating Area

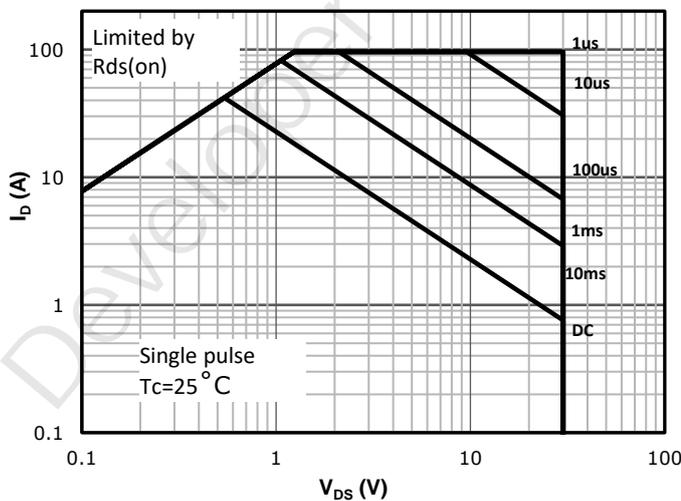
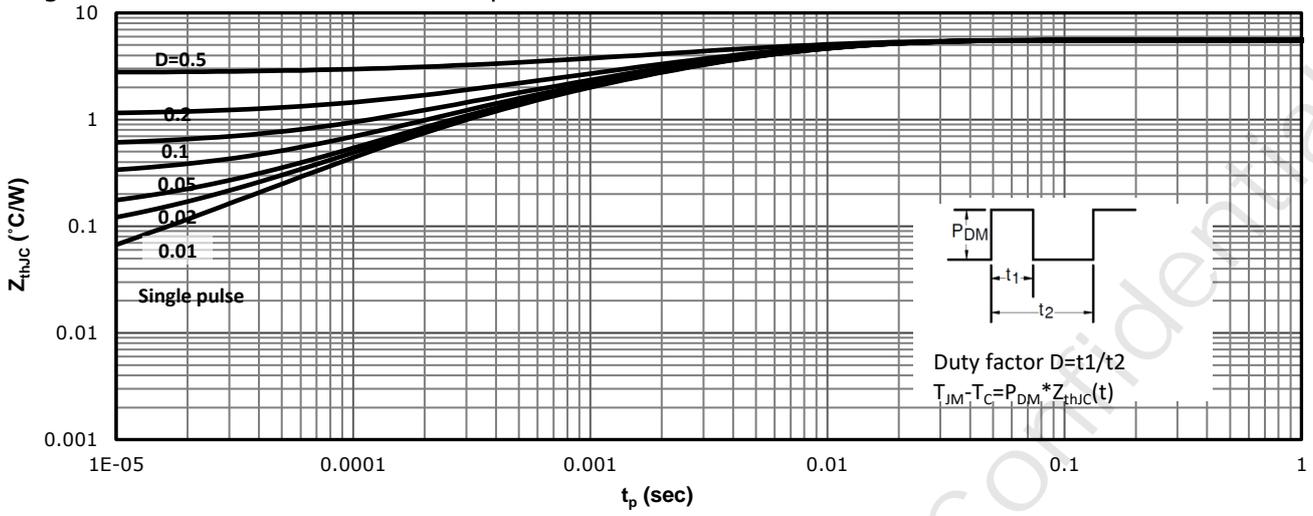


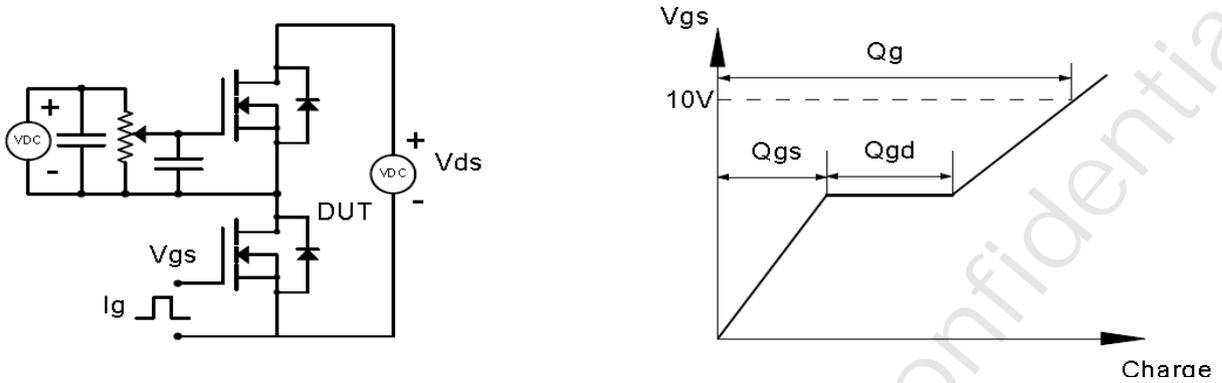


Fig 12: Max. Transient Thermal Impedance

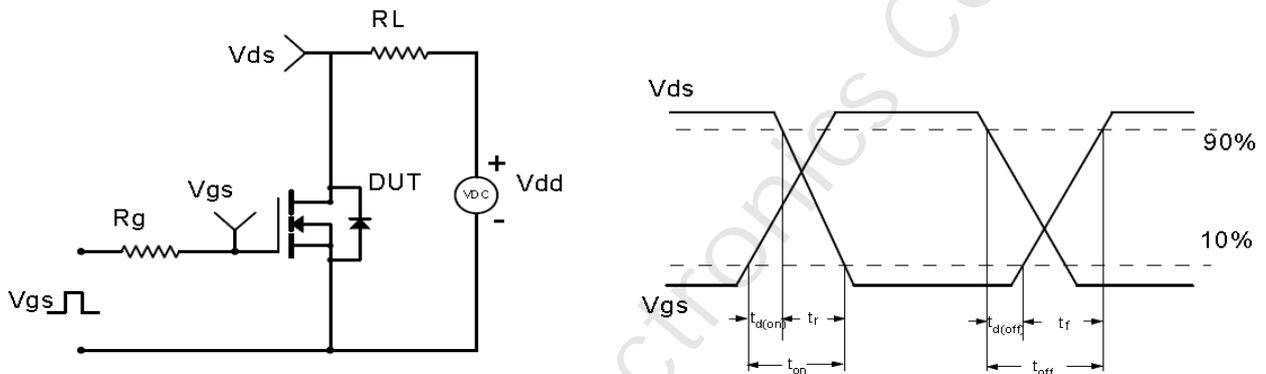


Test Circuit & Waveform

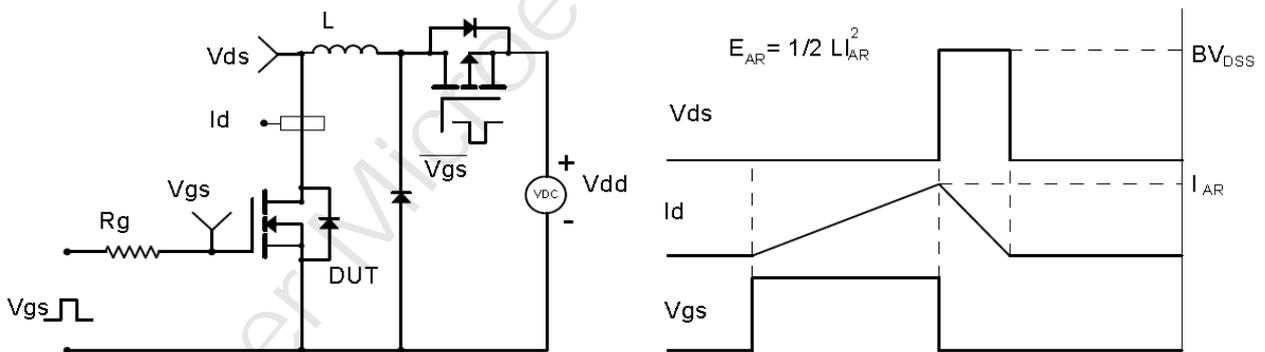
Gate Charge Test Circuit & Waveform



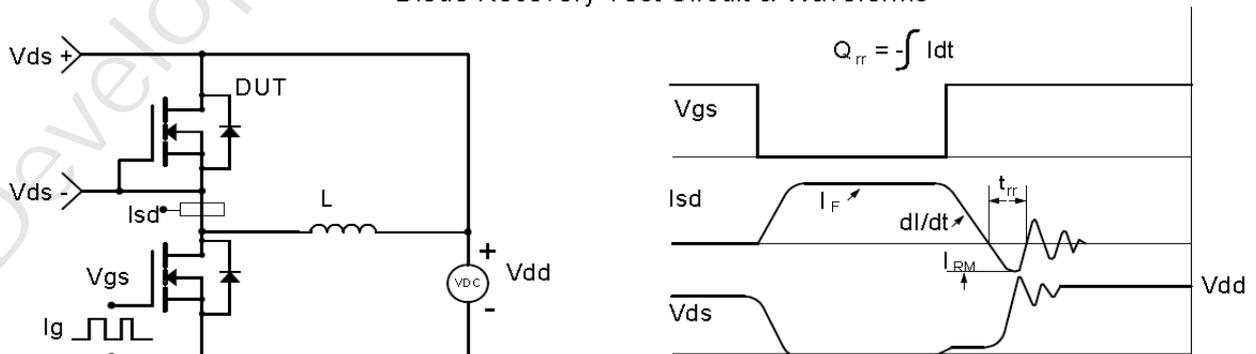
Resistive Switching Test Circuit & Waveforms



Unclamped Inductive Switching (UIS) Test Circuit & Waveforms

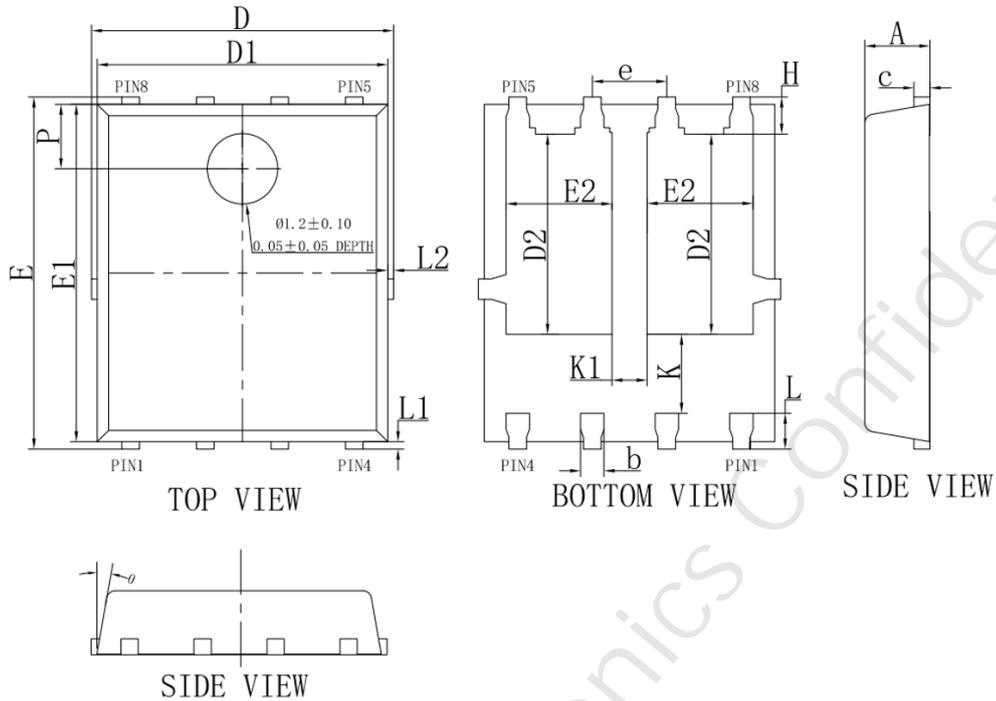


Diode Recovery Test Circuit & Waveforms



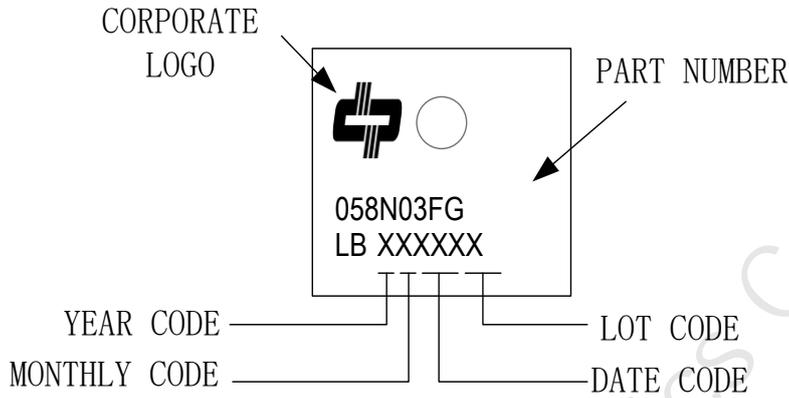


Package Outline: PDFN5X6-8



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
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

Revision	Major changes
1.0	Release for formal version

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