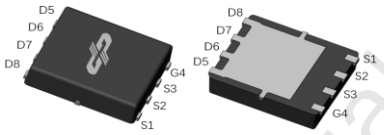
DP050N06FGL

DPMOS N-MOSFET 60V, 4mΩ, 60A

Product Summary

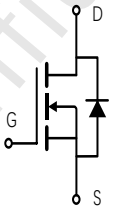
Part #	V_{DS}	$R_{DS(on).typ}$ (@V_{GS}=10V)	$R_{DS(on).typ}$ (@V_{GS}=4.5V)	I_D
DP050N06FGL	60V	4mΩ	5mΩ	60A

DFN5X6



Features

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



MSL level1

100% Avalanche Tested

100% Rg Tested

Applications

- Motor control and drive
- Power Management Switches
- High-frequency switching and synchronous rectification

Package Marking and Ordering Information

Part #	Marking	Package	Packing
DP050N06FGL	050N06FGL	DFN5X6	Tape/Reel

Halogen-Free

Absolute Maximum Ratings

Parameter	Symbol	Value	Unit
Drain-source voltage	V_{DS}	60	V
Continuous drain current T_C = 25°C T_C = 25°C (Package limit) T_C = 100°C	I_D	 90 60 57	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}	135	mJ
Gate-Source voltage	V_{GS}	±20	V
Power dissipation (T_C = 25°C)	P_{tot}	66	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.

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Thermal Resistance

Parameter	Symbol	Max	Unit
Thermal resistance, junction – case.	R_{thJC}	1.9	°C/W
Thermal resistance, junction – ambient(min. footprint)	R_{thJA}	54	

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}	60	-	-	V	V_{GS}=0V, I_D=250uA
Gate threshold voltage	$V_{GS(th)}$	1	-	2	V	V_{DS}=V_{GS},I_D=250uA
Zero gate voltage drain current	I_{DSS}	-	-	1	μA	V_{DS}=60V,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	$R_{DS(on)}$	-	4.0	5.0	mΩ	T_j=25°C V_{GS}=10V, I_D=10A
		-	5.0	6.8	mΩ	V_{GS}=4.5V, I_D=8A
Gate resistance	R_g	-	0.6	5.0	Ω	V_{GS}=0V, V_{DS}=0V, f=1MHz
Dynamic Characteristic[2]						
Input Capacitance	C_{iss}	-	2105	-	pF	V_{GS}=0V, V_{DS}=30V, f=1MHz
Output Capacitance	C_{oss}	-	587	-		
Reverse Transfer Capacitance	C_{rss}	-	18	-		
Gate Total Charge@V_{GS}=10V	Q_g	-	28	-	nC	V_{GS}=10V, V_{DS}=30V, I_D=25A, f=1MHz
Gate Total Charge@V_{GS}=4.5V	Q_g	-	17	-		
Gate-Source charge	Q_{gs}	-	7	-		
Gate-Drain charge	Q_{gd}	-	6.5	-		
Turn-on delay time	$t_{d(on)}$	-	29	-	ns	V_{GS}=10V, V_{DD}=30V, R_{G_ext}=2.7Ω
Rise time	t_r	-	11	-		
Turn-off delay time	$t_{d(off)}$	-	47	-		
Fall time	t_f	-	8.5	-		

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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}=25A
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}	-	37	-	ns	I_F=25A, dI/dt=100A/μs
Body Diode Reverse Recovery Charge[2]	Q_{rr}	-	69	-	nC	

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

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Typical Performance Characteristics

Fig 1: Output Characteristics

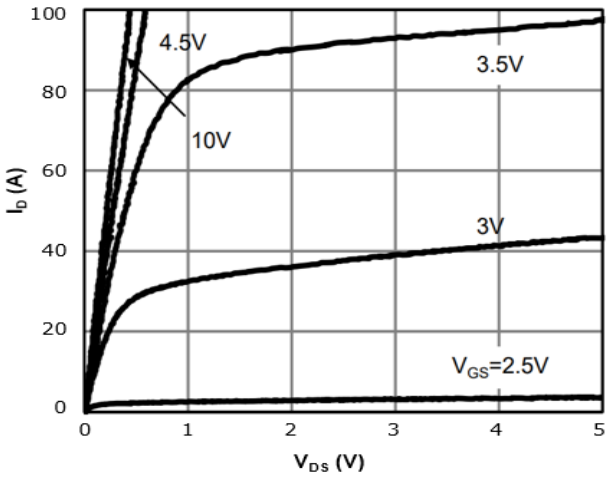


Fig 2: Transfer Characteristics

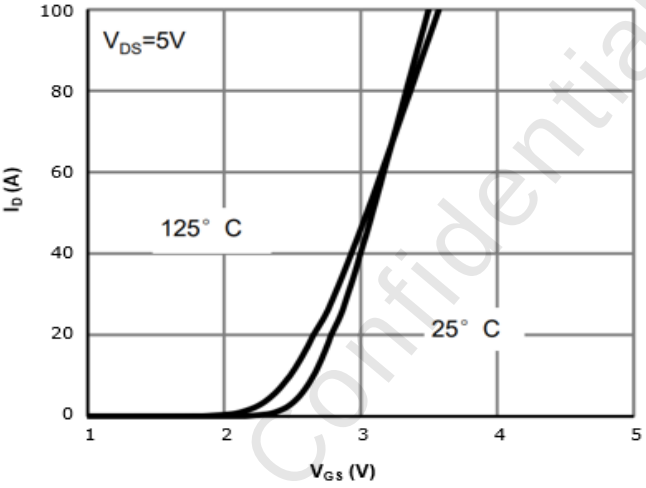


Fig 3: Rds(on) vs Drain Current and Gate Voltage

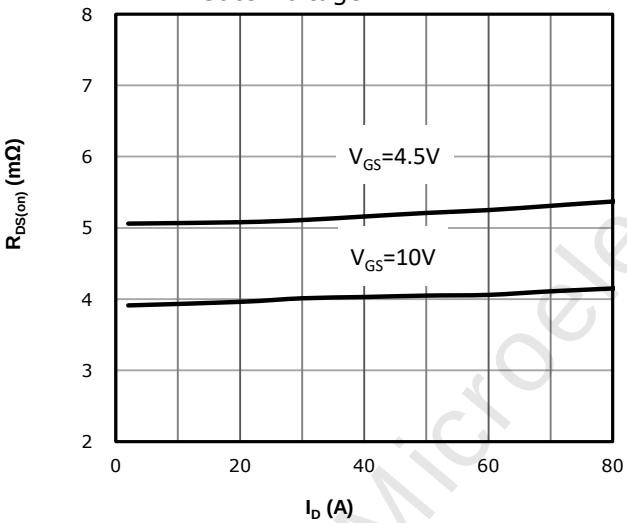


Fig 4: Rds(on) vs Gate Voltage

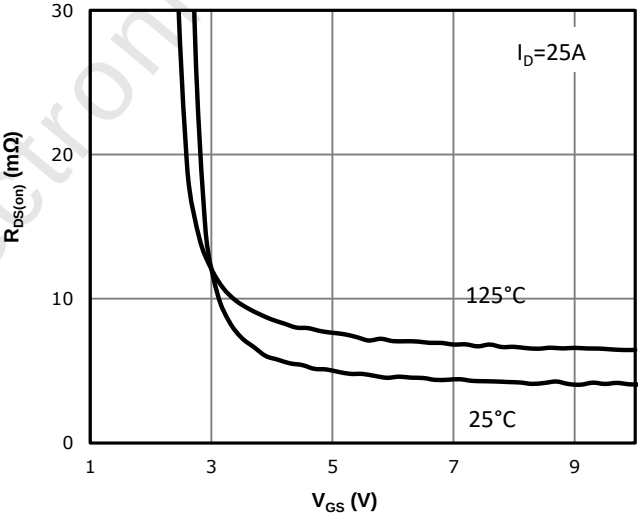


Fig 5: Rds(on) vs. Temperature

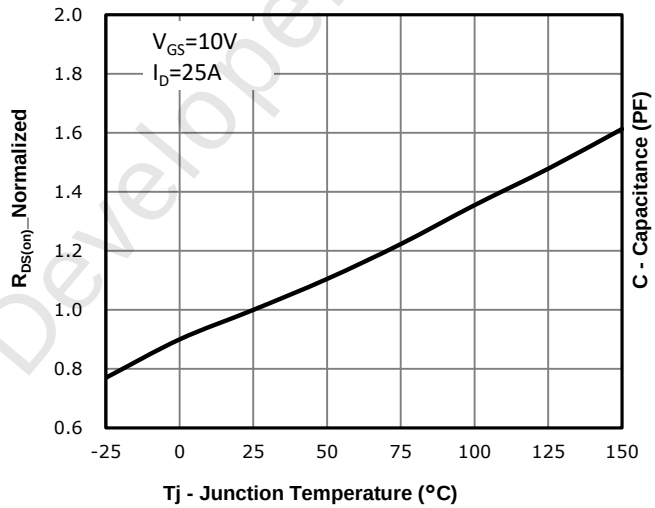
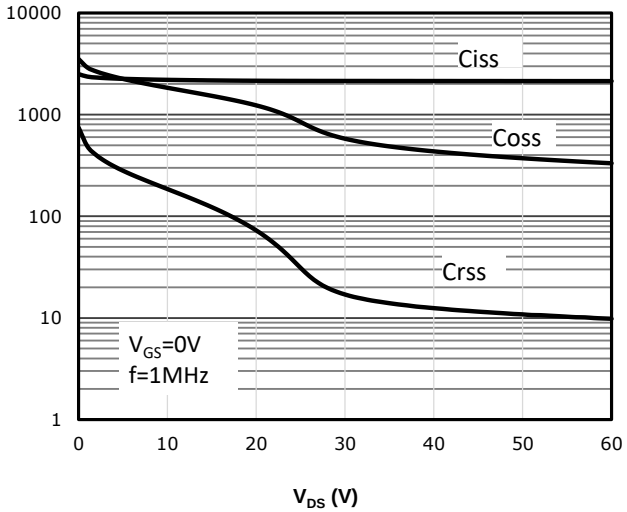


Fig 6: Capacitance Characteristics



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Fig 7: Gate Charge Characteristics

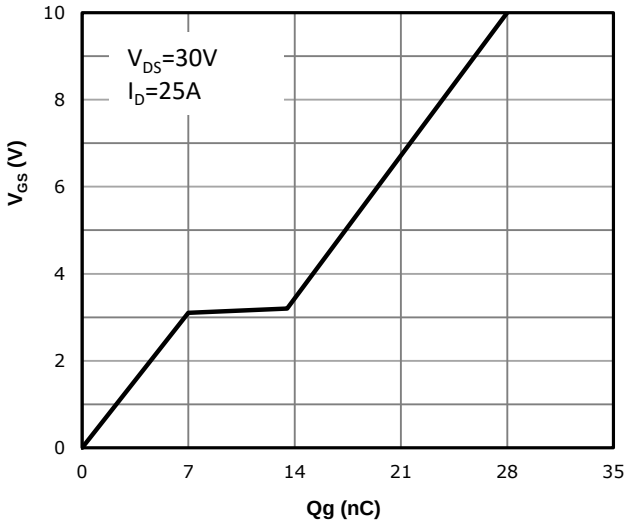


Fig 8: Body-diode Forward Characteristics

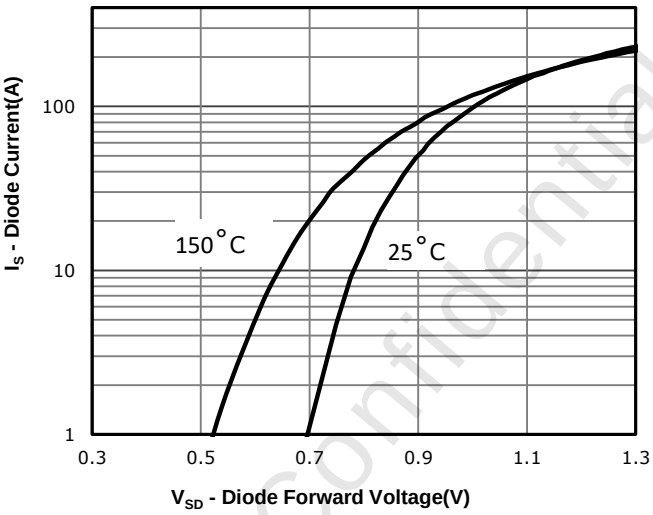


Fig 9: Power Dissipation

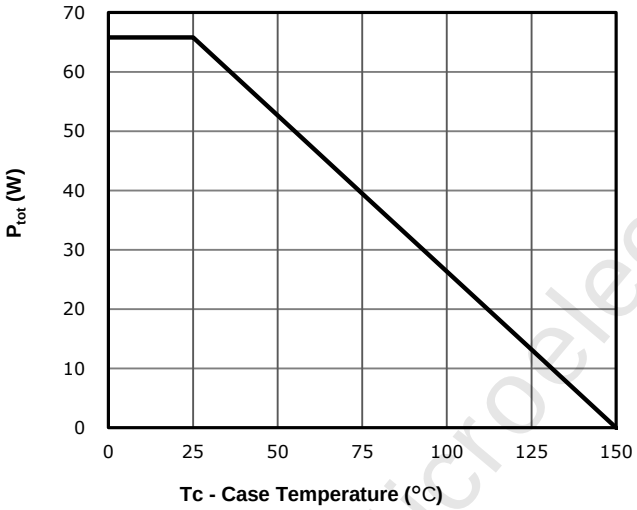


Fig 10: Drain Current Derating

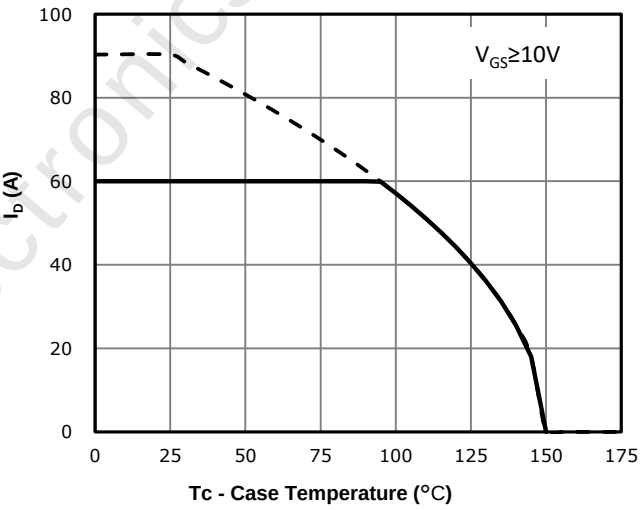
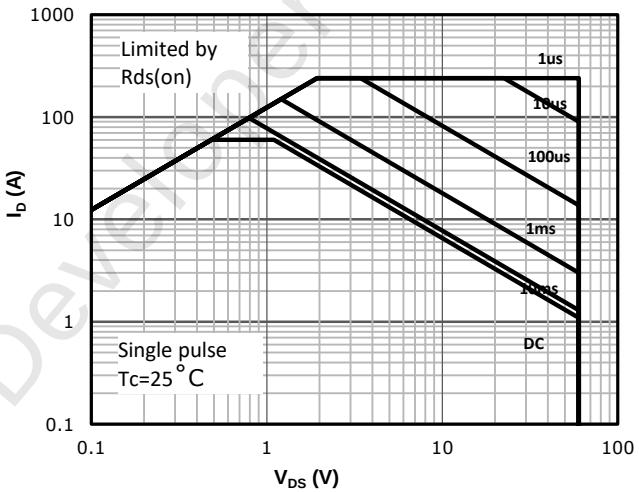
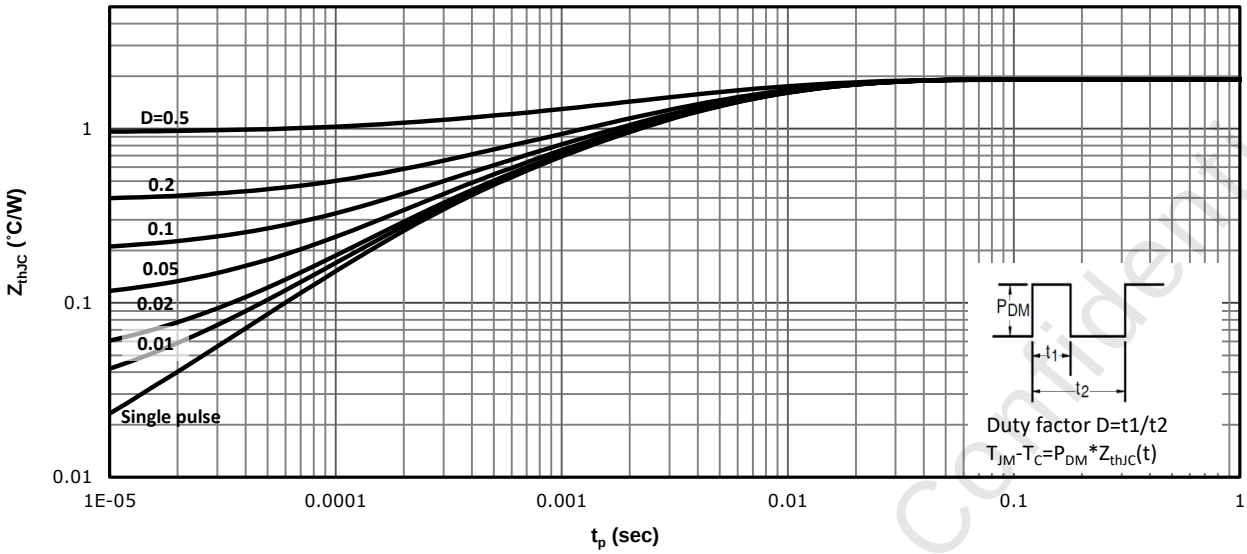


Fig 11: Safe Operating Area



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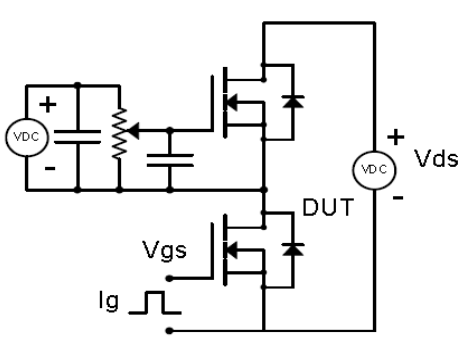
Fig 12: Max. Transient Thermal Impedance

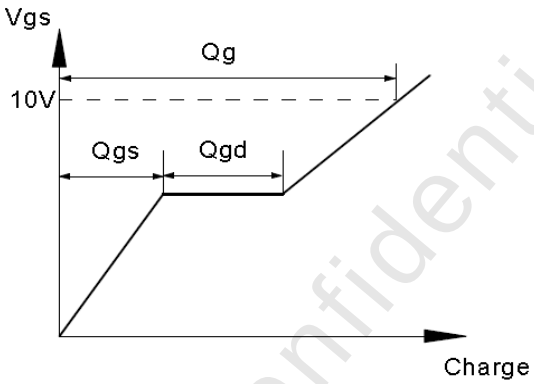


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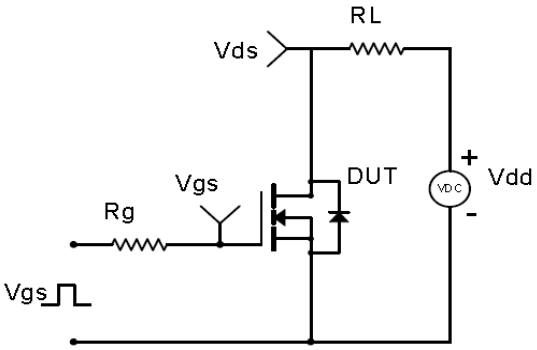
Test Circuit & Waveform

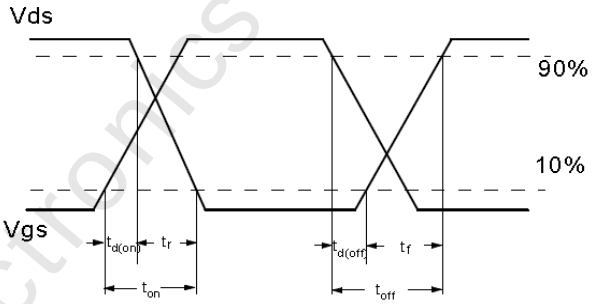
Gate Charge Test Circuit & Waveform



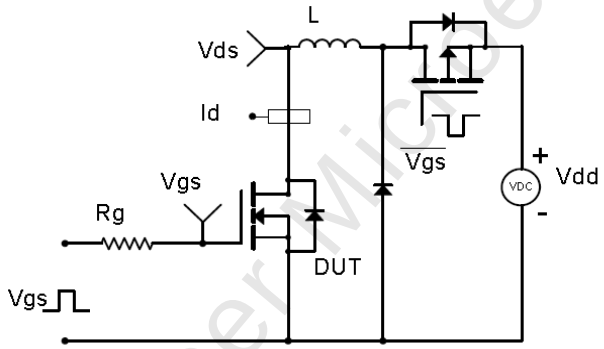


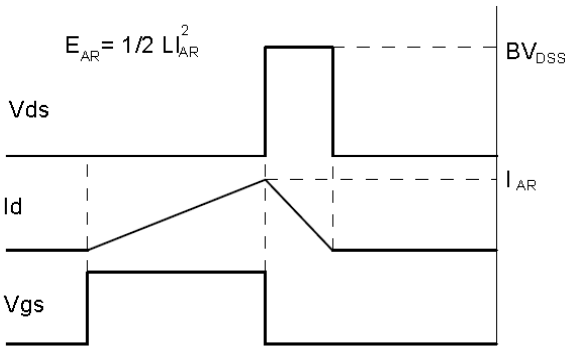
Resistive Switching Test Circuit & Waveforms



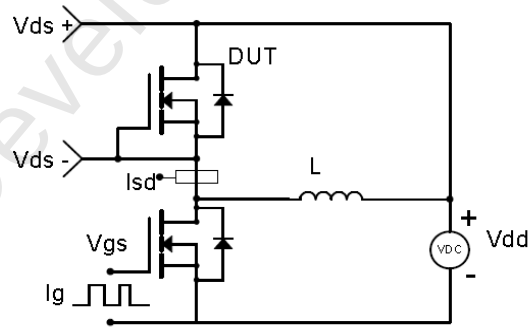


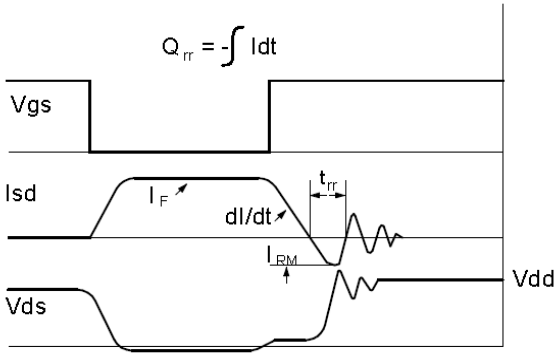
Unclamped Inductive Switching (UIS) Test Circuit & Waveforms





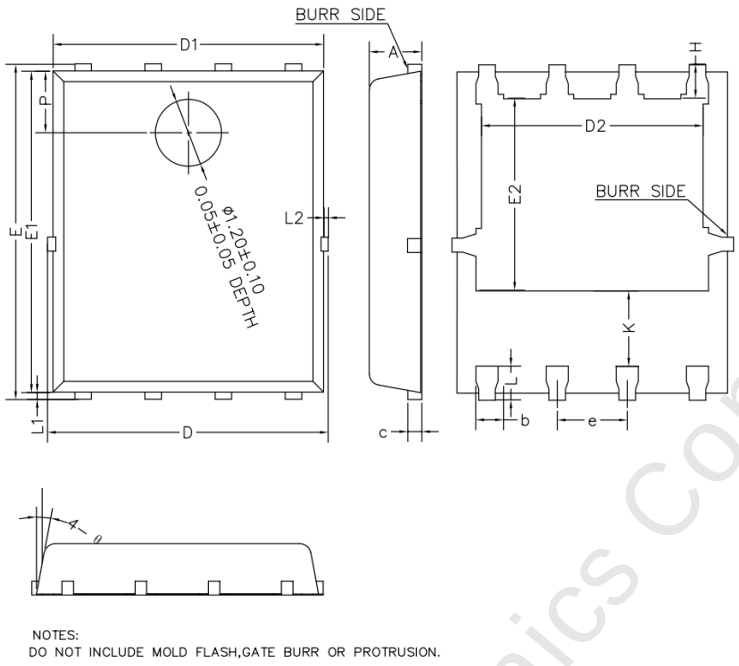
Diode Recovery Test Circuit & Waveforms





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Package Outline: DFN5X6

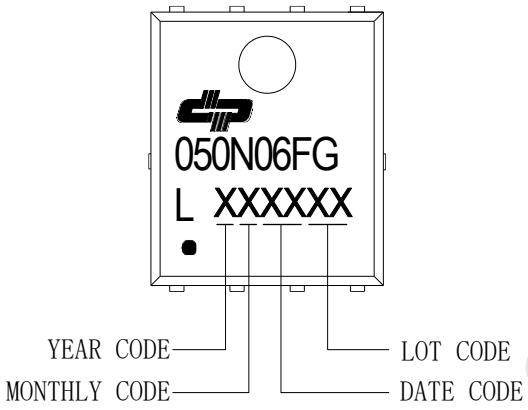


NOTES:
DO NOT INCLUDE MOLD FLASH,GATE BURR OR PROTRUSION.

Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	1.00	1.20	0.039	0.047
b	0.35	0.45	0.014	0.018
c	0.21	0.34	0.008	0.013
D	-	5.10	-	0.201
D1	4.90	5.00	0.193	0.197
D2	3.91	4.11	0.154	0.162
e	1.17	1.37	0.046	0.054
E	5.90	6.10	0.232	0.240
E1	5.70	5.80	0.224	0.228
E2	3.34	3.54	0.131	0.139
H	0.51	0.71	0.020	0.028
K	1.10	-	0.043	-
L	0.51	0.71	0.020	0.028
L1	0.06	0.20	0.002	0.008
L2	-	0.10	-	0.004
P	1.00	1.10	0.039	0.043
θ	8°	12°	-	-

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Part Marking Information



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Revision History

Revison	Major changes
1.00	Release for formal version

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