

Product Summary

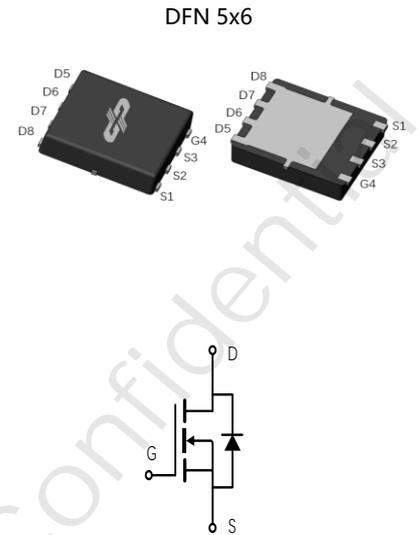
Part #	V _{DS}	R _{DS(on).typ} (@V _{GS} =4.5V)	R _{DS(on).typ} (@V _{GS} =2.5V)	I _D
DP032N02FTS	20V	3mΩ	3.8mΩ	60A

Features

- Advanced high cell density Trench MOSFET technology
- Better R_{DS(on)} enabled by a low R_{DS(on).spr} low conduction losses
- Excellent Q_gxR_{DS(on)} product(FOM)
- Qualified according to JEDEC criteria

Applications

- Battery management
- Power Management Switches



100% Avalanche Tested

 100% R_g Tested

Package Marking and Ordering Information

Part #	Marking	Package	Packing
DP032N02FTS	032N02FTS	DFN 5x6	Tape/Reel


Absolute Maximum Ratings

Parameter	Symbol	Value	Unit
Drain-source voltage	V _{DS}	20	V
Continuous drain current	I _D	60	A
T _C = 25°C		50	
T _C = 100°C	I _{D pulse}	240	A
Pulsed drain current (T _C = 25°C, t _p limited by T _{jmax})	E _{AS}	55	mJ
Avalanche energy, single pulse (I=0.1mA, R _g =25) ^[1]	V _{GS}	±10	V
Gate-Source voltage	P _{tot}	42	W
Power dissipation (T _C = 25°C)	T _j , T _{stg}	-55...+150	°C
Operating junction and storage temperature			

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

Thermal Resistance

Parameter	Symbol	Max	Unit
Thermal resistance, junction – case.	R _{thJC}	3	°C/W
Thermal resistance, junction – ambient(min. footprint)	R _{thJA}	55	

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

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

Static Characteristic

Drain-source breakdown voltage	BV _{DSS}	20	-	-	V	V _{GS} =0V, I _D =250uA
Gate threshold voltage	V _{GS(th)}	0.4	-	1	V	V _{DS} =V _{GS} , I _D =250uA
Zero gate voltage drain current	I _{DSS}	-	-	1	μA	V _{DS} =20V, V _{GS} =0V
		-	-	100		T _j =150°C
Gate-source leakage current	I _{GSS}	-	-	±100	nA	V _{GS} =±10V, V _{DS} =0V
Drain-source on-state resistance	R _{DS(on)}	-	3.0	3.8	mΩ	T _j =25°C
		-	3.8	5.1	mΩ	V _{GS} =2.5V, I _D =20A

Dynamic Characteristic^[2]

Input Capacitance	C _{iss}	-	3554	-	pF	V _{GS} =0V, V _{DS} =10V, f=1MHz
Output Capacitance	C _{oss}	-	702	-		
Reverse Transfer Capacitance	C _{rss}	-	588	-		
Gate Total Charge(V _{GS} =10V)	Q _g	-	36	-	nC	V _{GS} =10V, V _{DS} =10V, I _D =20A, f=1MHz
Gate Total Charge(V _{GS} =4.5V)	Q _g	-	24	-		
Gate-Source charge	Q _{gs}	-	8	-		
Gate-Drain charge	Q _{gd}	-	13	-		
Turn-on delay time	t _{d(on)}	-	7	-	ns	V _{GS} =4.5V, V _{DD} =10V, R _{G_ext} =2.7Ω
Rise time	t _r	-	21	-		
Turn-off delay time	t _{d(off)}	-	32	-		
Fall time	t _f	-	20	-		

Body Diode Characteristic

Parameter	Symbol	Value			Unit	Test Condition
		min.	typ.	max.		
Body Diode Forward Voltage	V_{SD}	-	0.81	1.1	V	$V_{GS}=0V, I_{SD}=20A$
Diode continuous forward current	I_s	-	-	60	A	$T_C = 25^\circ C$
Diode pluse current	$I_{s\ pluse}$	-	-	240	A	$T_C = 25^\circ C$
Body Diode Reverse Recovery Time ^[2]	t_{rr}	-	49	-	ns	$I_F=20A, di/dt=100A/\mu s$
Body Diode Reverse Recovery Charge ^[2]	Q_{rr}	-	32	-	nC	

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

Typical Performance Characteristics

Fig 1: Output Characteristics

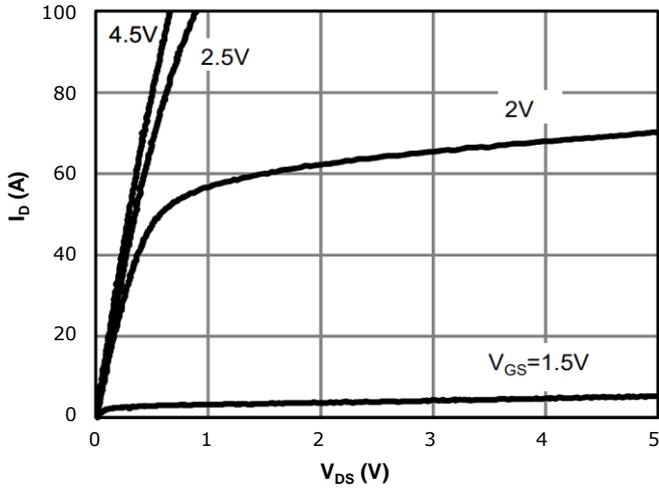


Fig 2: Transfer Characteristics

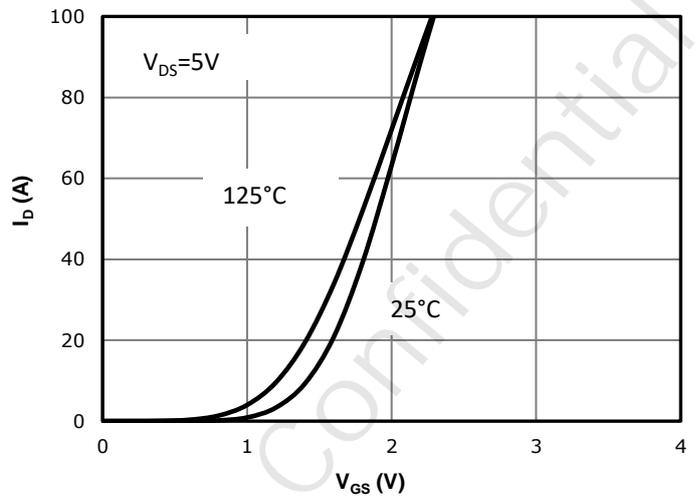


Fig 3: $R_{DS(on)}$ vs Drain Current and Gate Voltage

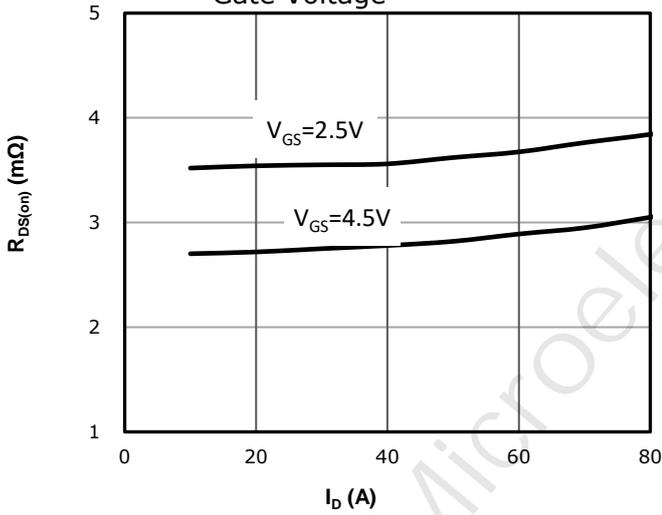


Fig 4: $R_{DS(on)}$ vs Gate Voltage

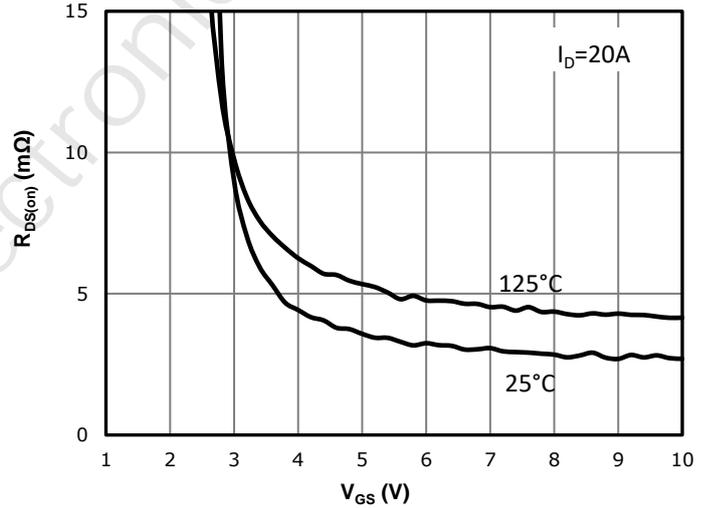


Fig 5: $R_{DS(on)}$ vs. Temperature

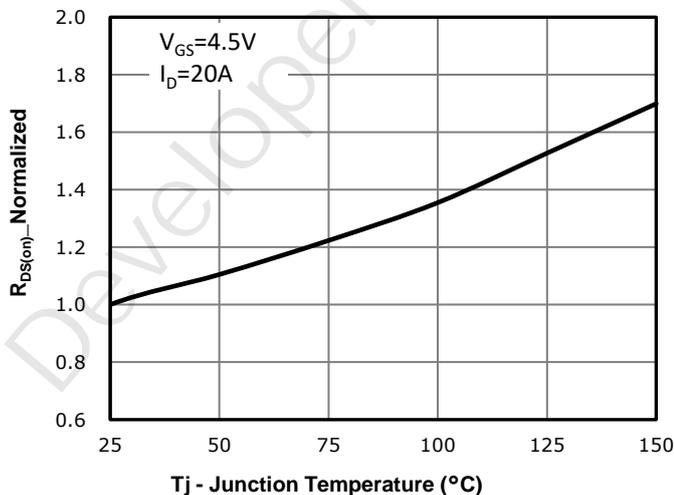


Fig 6: Capacitance Characteristics

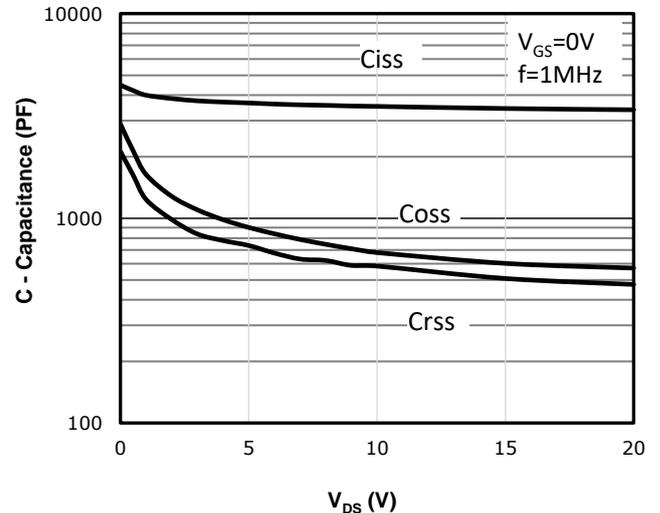


Fig 7: Gate Charge Characteristics

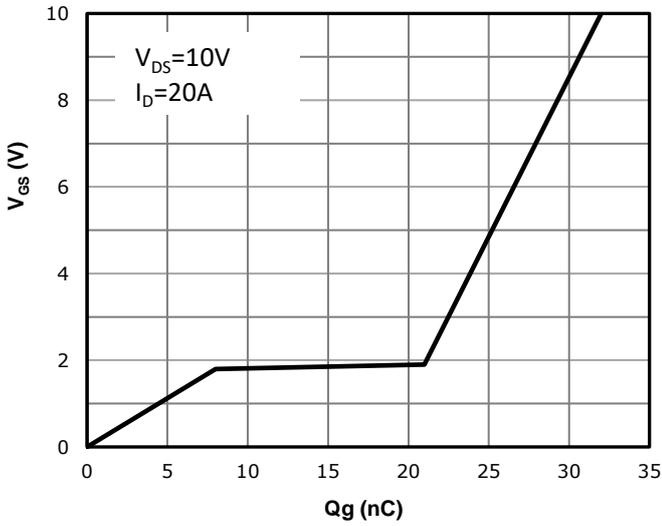


Fig 8: Body-diode Forward Characteristics

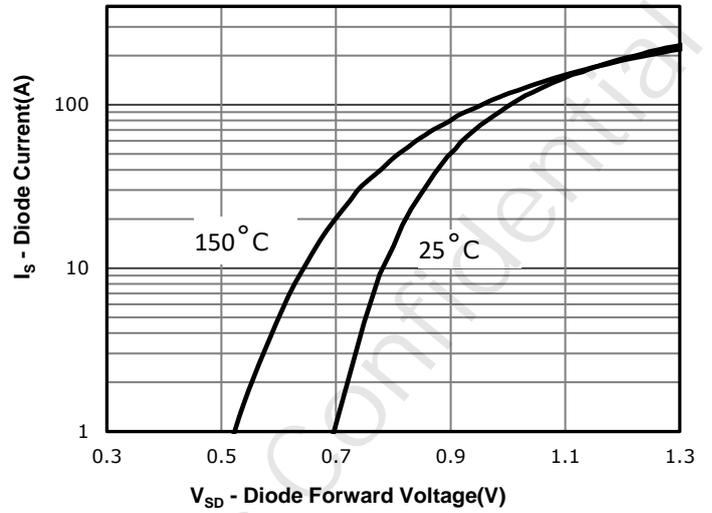


Fig 9: Power Dissipation

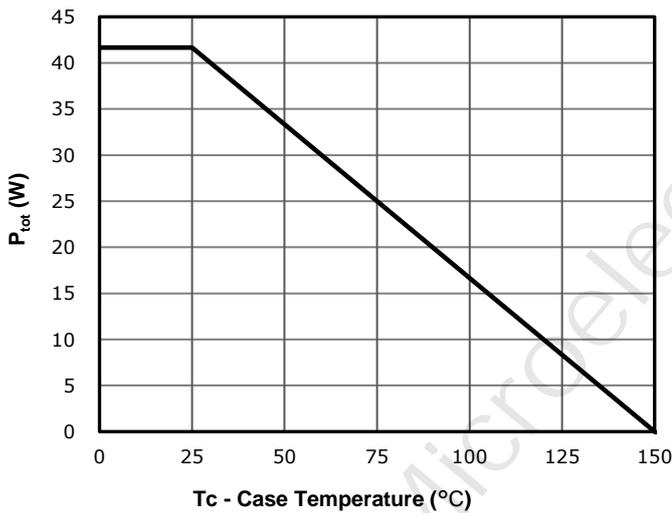


Fig 10: Drain Current Derating

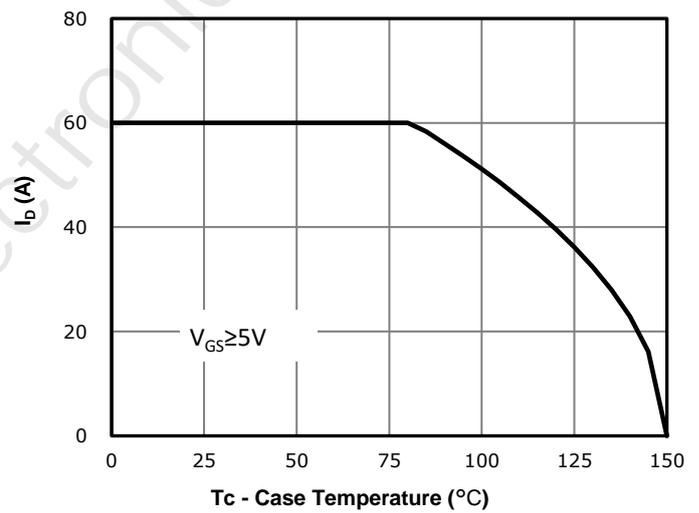


Fig 11: Safe Operating Area

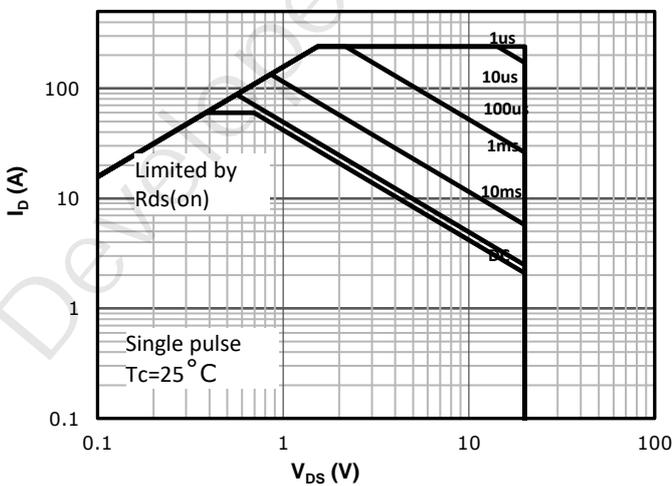
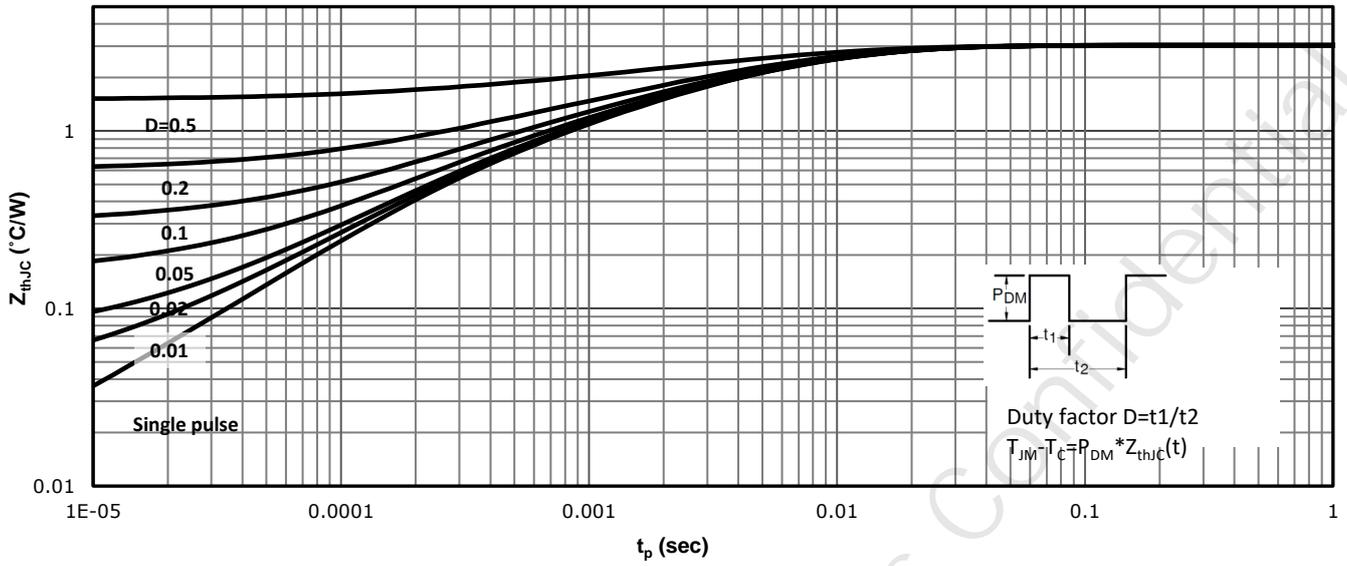
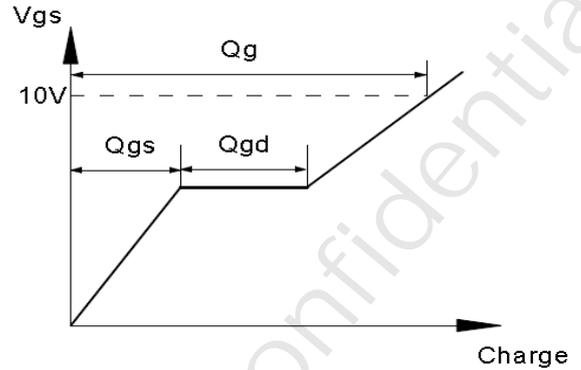
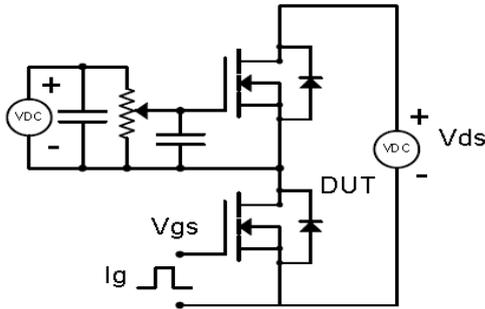


Fig 12: Max. Transient Thermal Impedance

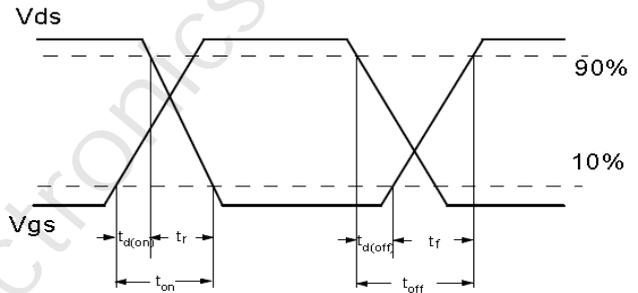
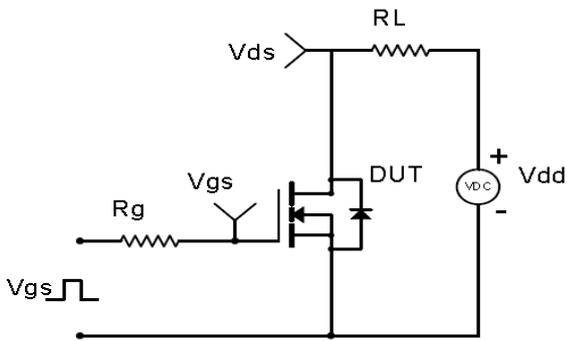


Test Circuit & Waveform

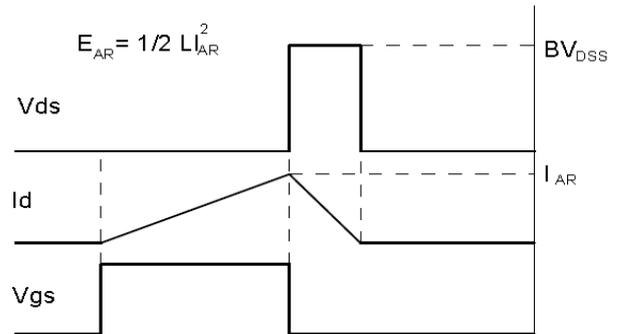
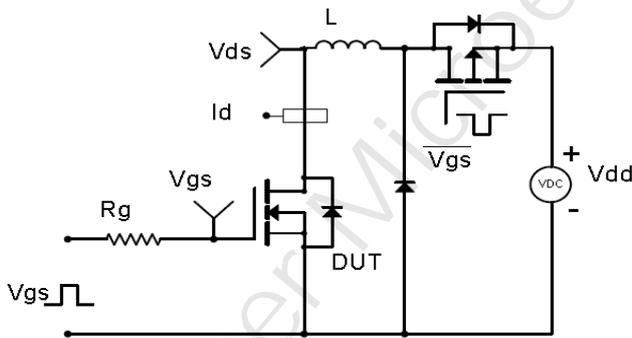
Gate Charge Test Circuit & Waveform



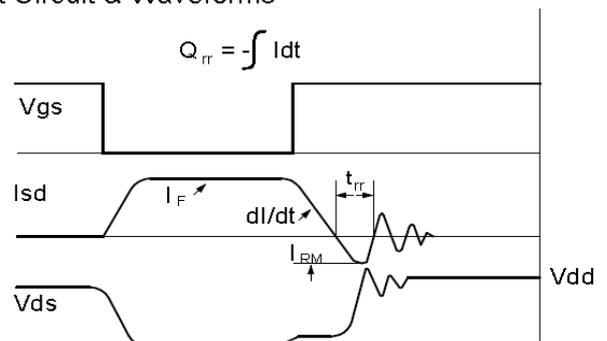
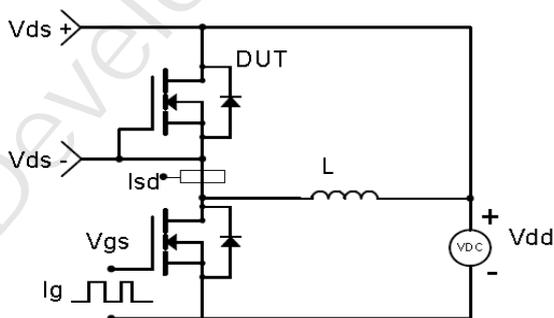
Resistive Switching Test Circuit & Waveforms



Unclamped Inductive Switching (UIS) Test Circuit & Waveforms

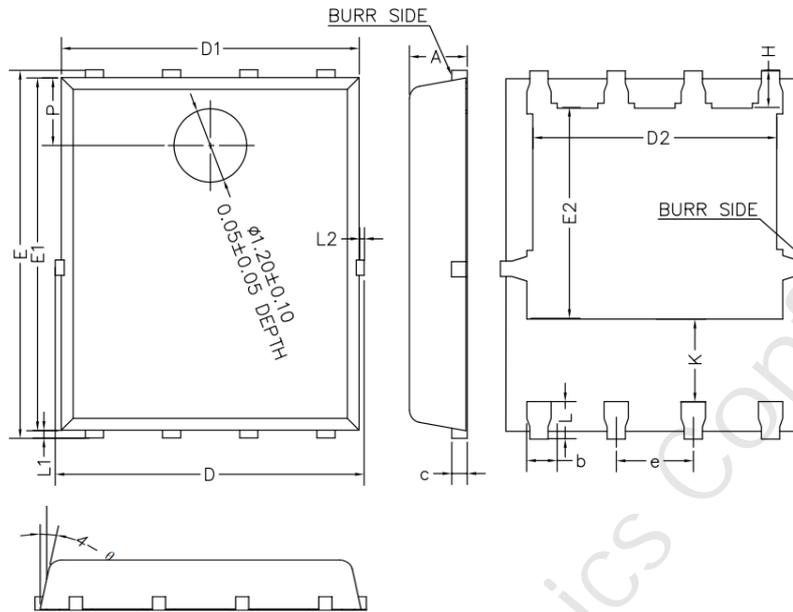


Diode Recovery Test Circuit & Waveforms





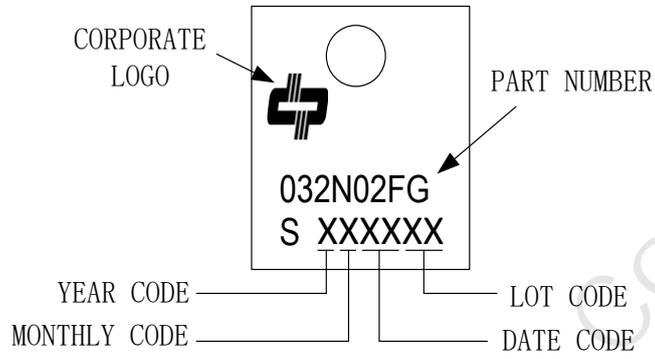
Package Outline: DFN 5x6



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°	-	-

Part Marking Information



Revision History

Revision	Major changes
1.1	Release for formal version

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