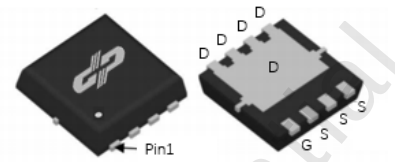
DP160P02MTS

DPMOS P-MOSFET -20V, 10mΩ, -32A

Product Summary

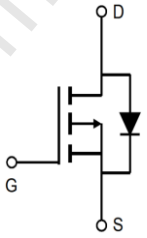
Part #	V_{DS}	$R_{DS(on).typ}$ (@V_{GS}=-4.5V)	$R_{DS(on).typ}$ (@V_{GS}=-2.5V)	I_D
DP160P02MTS	-20V	10mΩ	14.5mΩ	-32A

DFN 3.3x3.3



Features

- Uses advanced MOSFET-DPMOS technology
- Extremely low on-resistance $R_{DS(on)}$
- Excellent Q_gx$R_{DS(on)}$ product(FOM)



Applications

- Battery path load switch
- PWM Application
- Power Managemen

100% Avalanche Tested

100% Rg Tested

Package Marking and Ordering Information

Part #	Marking	Package	Packing
DP160P02MTS	DP160P02MTS	DFN 3.3x3.3	Tape&Reel

Halogen-Free

Absolute Maximum Ratings

Parameter	Symbol	Value	Unit
Drain-source voltage	V_{DS}	-20	V
Continuous drain current T_C = 25°C (Silicon limit) T_C = 100°C (Silicon limit)	I_D	 -32 -21	A
Pulsed drain current (T_C = 25°C, t_p limited by T_{jmax})	$I_{D\ pulse}$	-128	A
Avalanche energy, single pulse (L=0.1mH, Rg=25Ω)[1]	E_{AS}	11	mJ
Gate-Source voltage	V_{GS}	±12	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 Tj = 25℃, VGS = 10V.

Thermal Resistance

Parameter	Symbol	Max	Unit
Thermal resistance, junction – ambient(min. footprint)	R_{thJA}	52	°C/W

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}	-20	-	-	V	V_{GS}=0V, I_D=-250uA
Gate threshold voltage	$V_{GS(th)}$	-0.4	-0.8	-1.2	V	V_{DS}=V_{GS},I_D=-250uA
Zero gate voltage drain current	I_{DSS}	- -	- -	-1 -100	μA	V_{DS}=-20V,V_{GS}=0V T_j=25°C T_j=85°C
Gate-source leakage current	I_{GSS}	-	±10	±100	nA	V_{GS}=±12V,V_{DS}=0V
Drain-source on-state resistance	$R_{DS(on)}$	- -	10.0 14.5	12.5 20.0	mΩ	V_{GS}=-4.5V, I_D=-8A V_{GS}=-2.5V, I_D=-5A
Gate resistance	R_g	-	10	15	Ω	V_{GS}=0V, V_{DS}=0V, f=1MHz
Transconductance[2]	g_{fs}	-	50	-	S	V_{DS}=-5V,I_D=-20A
Dynamic Characteristic[2]						
Input Capacitance	C_{iss}	-	2649	-	pF	V_{GS}=0V, V_{DS}=-10V, f=1MHz
Output Capacitance	C_{oss}	-	820	-		
Reverse Transfer Capacitance	C_{rss}	-	670	-		
Gate Total Charge	Q_g	-	32	-	nC	V_{GS}=-4.5V, V_{DS}=-10V, I_D=-8A, f=1MHz
Gate-Source charge	Q_{gs}	-	5	-		
Gate-Drain charge	Q_{gd}	-	11	-		
Turn-on delay time	$t_{d(on)}$	-	17	-	ns	V_{GS}=-4.5V, V_{DD}=-10V, R_{G_ext}=2.7Ω
Rise time	t_r	-	25	-		
Turn-off delay time	$t_{d(off)}$	-	32	-		
Fall time	t_f	-	30	-		

Body Diode Characteristic

Parameter	Symbol	Value			Unit	Test Condition
		min.	typ.	max.		
Body Diode Forward Voltage	V_{SD}	-	-0.8	-1.2	V	V_{GS}=0V,I_{SD}=-8A
Diode continuous forward current	I_s	-	-	-32	A	TC = 25°C
Diode pluse current	$I_{s\ pluse}$	-	-	-128	A	TC = 25°C
Body Diode Reverse Recovery Time[2]	t_{rr}	-	19	-	ns	I_F=-8A, dI/dt=100A/μs
Body Diode Reverse Recovery Charge[2]	Q_{rr}	-	6	-	nC	

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

Typical Performance Characteristics

Fig 1: Output Characteristics

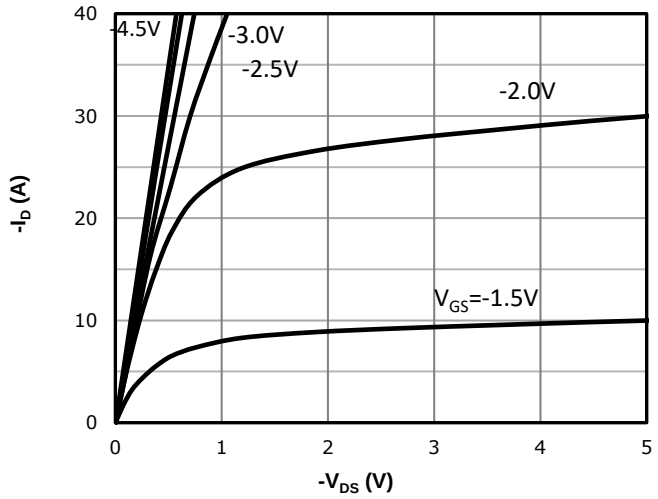


Fig 2: Transfer Characteristics

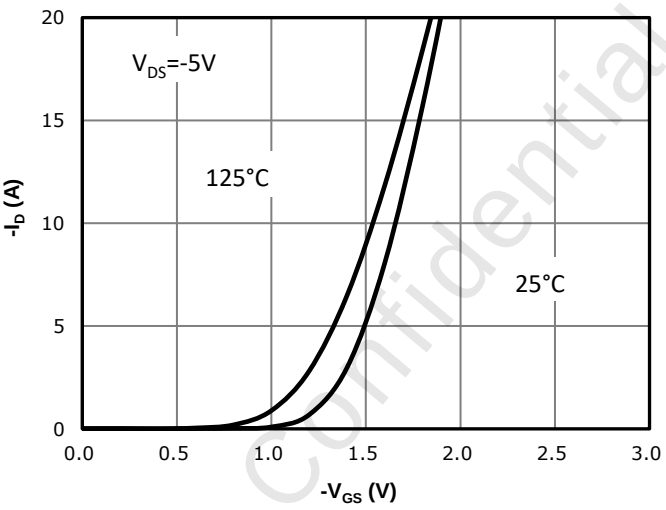


Fig 3: Rds(on) vs Drain Current and Gate Voltage

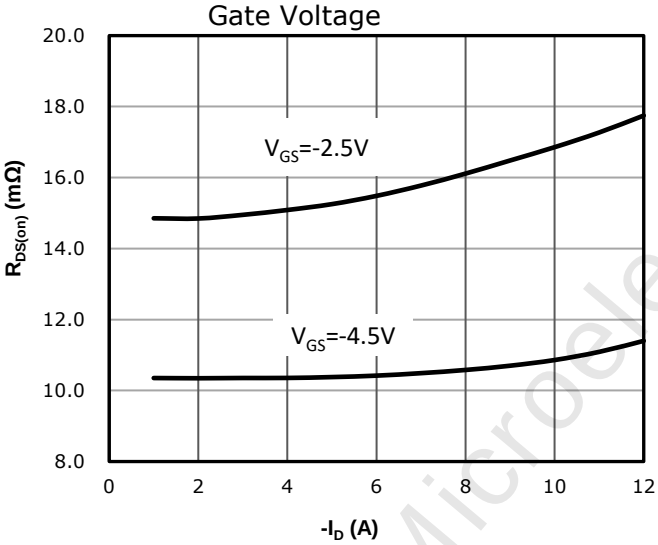


Fig 4: Rds(on) vs Gate Voltage

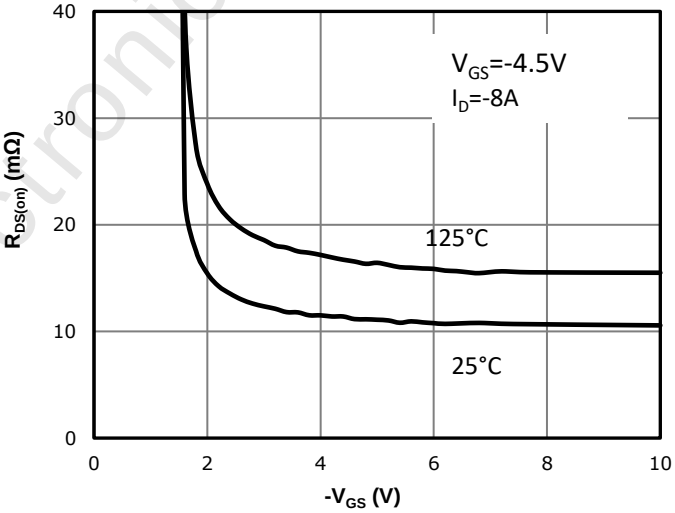


Fig 5: Rds(on) vs. Temperature

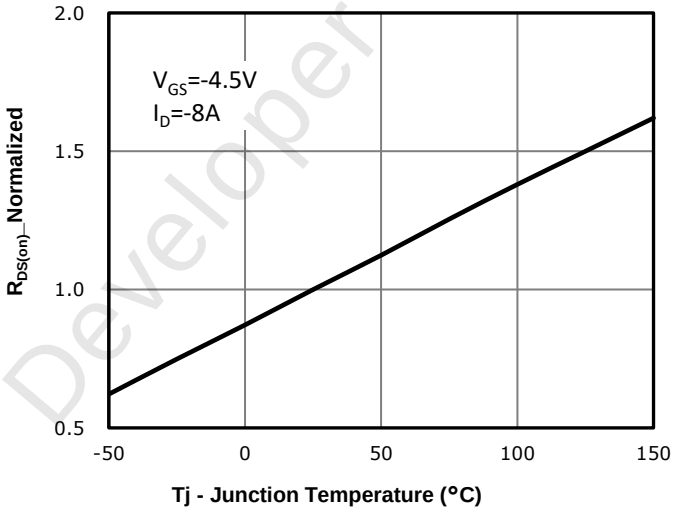


Fig 6: Capacitance Characteristics

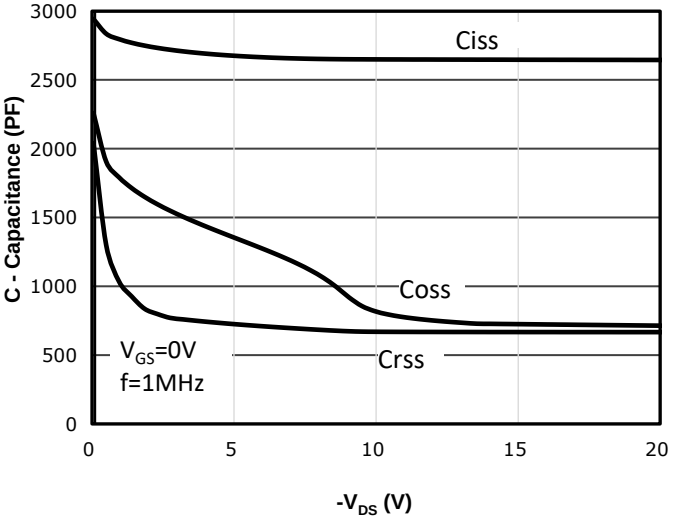


Fig 7: Gate Charge Characteristics

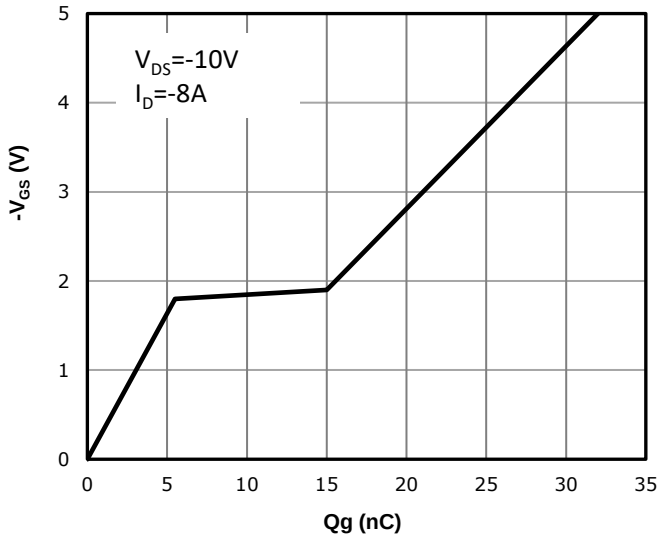


Fig 8: Body-diode Forward Characteristics

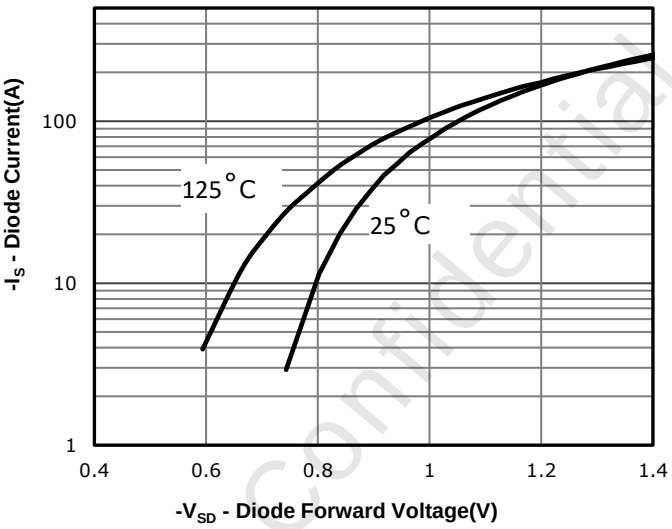


Fig 9: Power Dissipation

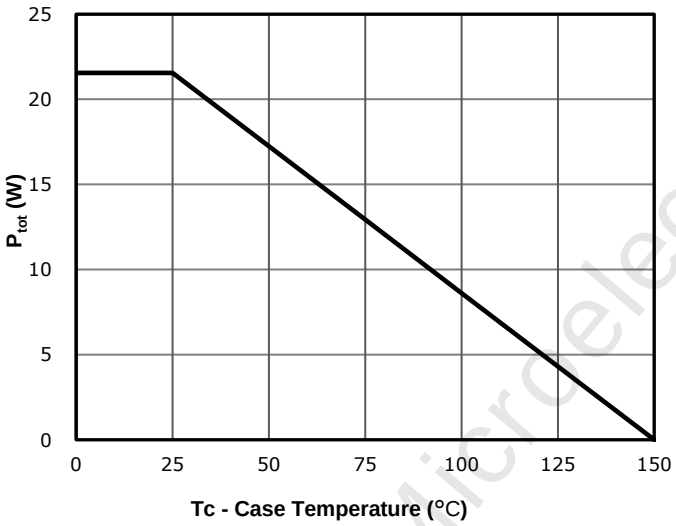


Fig 10: Drain Current Derating

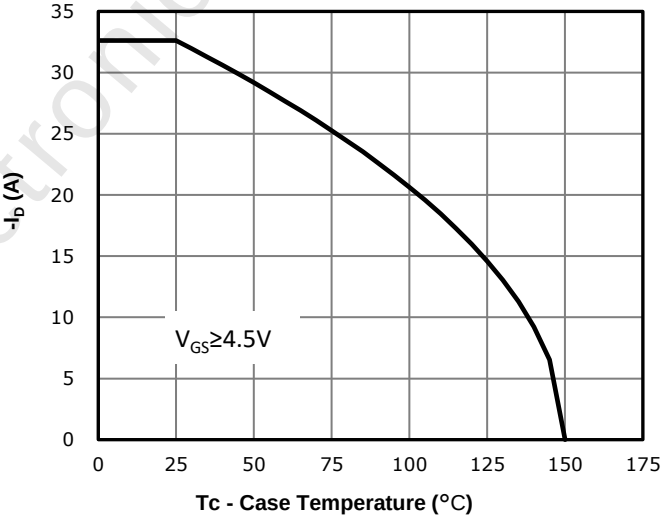


Fig 11: Safe Operating Area

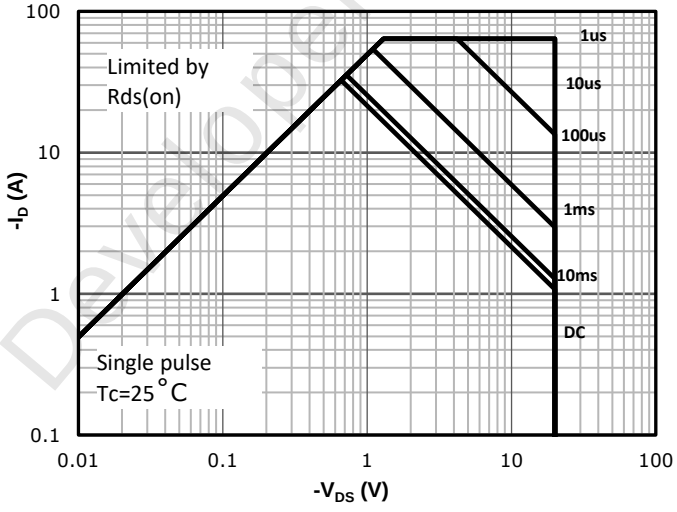
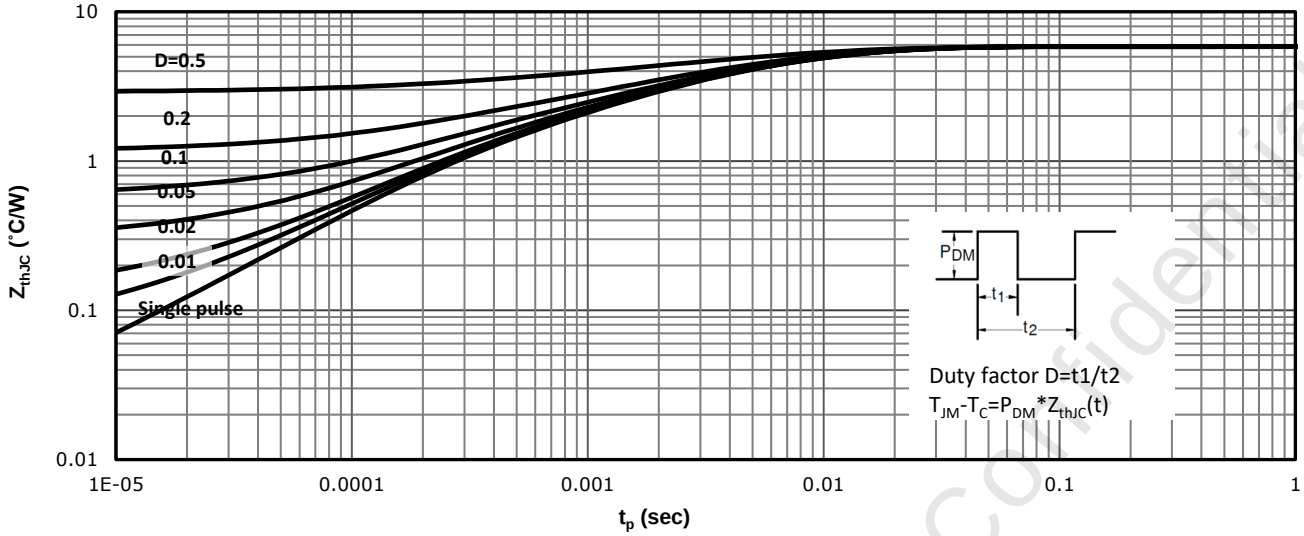
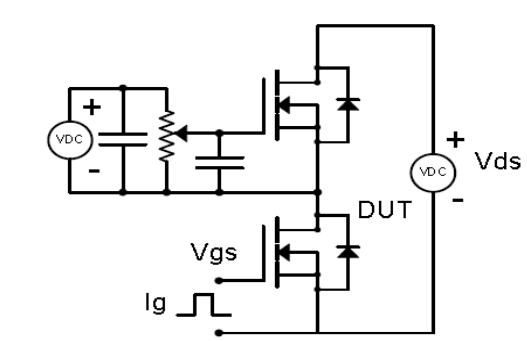


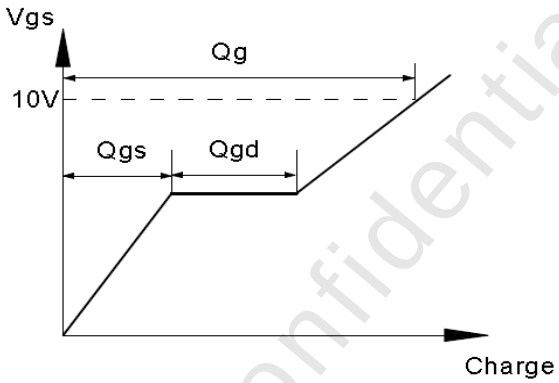
Fig 12: Max. Transient Thermal Impedance



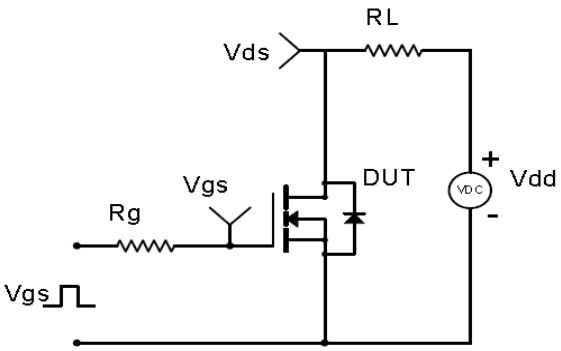
Test Circuit & Waveform

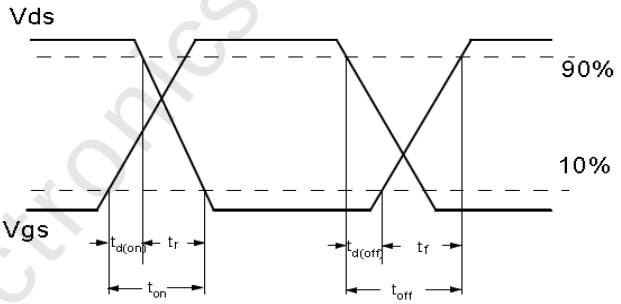
Gate Charge Test Circuit & Waveform



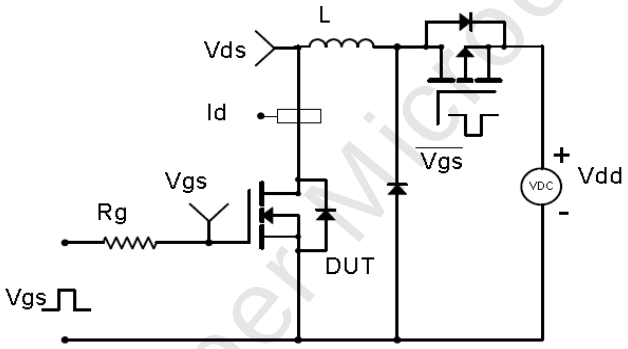


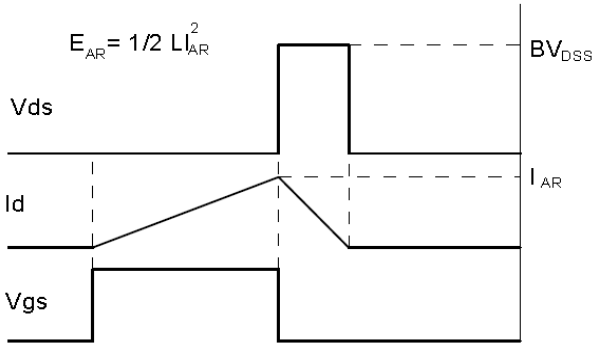
Resistive Switching Test Circuit & Waveforms



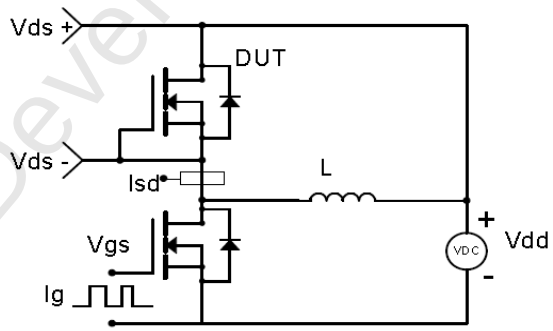


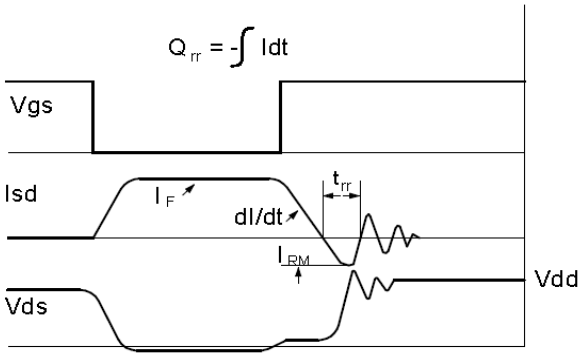
Unclamped Inductive Switching (UIS) Test Circuit & Waveforms



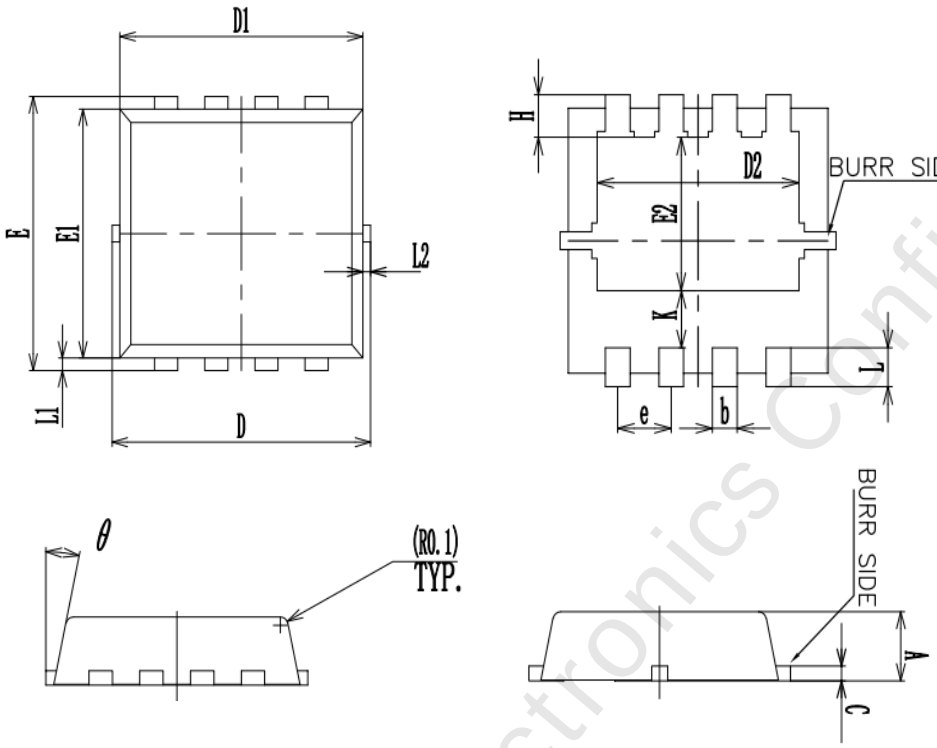


Diode Recovery Test Circuit & Waveforms



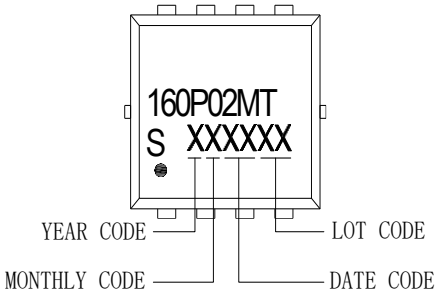


Package Outline: DFN 3.3x3.3



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	0.70	0.90	0.028	0.035
b	0.25	0.35	0.010	0.014
c	0.14	0.15	0.006	0.006
D	3.15	3.30	0.124	0.130
D1	3.05	3.15	0.120	0.124
D2	2.35	2.45	0.093	0.096
e	0.65 BSC		0.026 BSC	
E	3.20	3.30	0.126	0.130
E1	2.90	3.00	0.114	0.118
E2	1.64	1.74	0.065	0.069
H	0.38	0.48	0.015	0.019
K	0.59	0.69	0.023	-
L	0.25	0.40	0.010	0.016
L1	0.10	0.15	0.004	0.006
L2	-	0.15	-	0.006
θ	8°	12°	-	-

Part Marking Information



Revision History

Revison	Major changes
1.0	Release for formal version

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