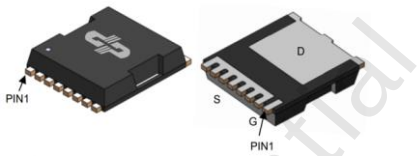
DPM075R040T8G2

N-Channel Silicon Carbide MOSFET

Product Summary

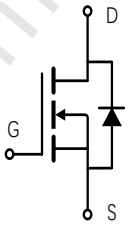
Part #	V_{DS}	$R_{DS(on)}$	I_D (T_{vj}=25℃)
DPM075R040T8G2	750V	35mΩ	62A

TOLL



Features

- High Speed Switching with Low Capacitances
- High Blocking Voltage with Low $R_{DS(on)}$
- Easy to parallel
- RoHS Compliant



Applications

- General purpose drives
- Energy storage systems
- String inverter
- Uninterruptible power supplies

Package Marking and Ordering Information

Part #	Marking	Package	Packing
DPM075R040T8G2	M075R0408G	TOLL	Tape/Reel

HAL Halogen-Free

Absolute Maximum Ratings

Parameter	Symbol	Value	Unit
Drain-source voltage	V_{DS}	750	V
Continuous drain current (V_{GS}=18V) T_C = 25°C T_C = 100°C	I_D	 62 44	A
Pulsed drain current (T_C = 25°C, t_p limited by T_{jmax})	$I_{D\ pulse}$	186	A
Gate-source voltage, max. transient voltage	V_{GSmax}	-10/+22	V
Gate-source voltage, max. static voltage	V_{GSop}	-5/+18	V
Power dissipation (T_C = 25°C) Power dissipation (T_C = 100°C)	P_{tot}	188 94	W
Operating junction temperature	T_j	-40...+175	°C
Storage temperature	T_{stg}	-40...+175	°C

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Thermal Resistance

Parameter	Symbol	Max	Unit
Thermal resistance, junction – mounting base	R_{thMB}	0.8	°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}	750	-	-	V	V_{GS}=0V, I_D=250uA
Gate threshold voltage	$V_{GS(th)}$	2.5	3.1 2.2	3.9	V	V_{DS}=V_{GS},I_D=5.2mA T_j=25°C T_j=175°C
Zero gate voltage drain current	I_{DSS}	-	0.1	20	μA	V_{DS}=750V,V_{GS}=0V T_j=25°C
Gate-source leakage current	I_{GSS}	-	-	250	nA	V_{GS}=18V,V_{DS}=0V
Drain-source on-state resistance	$R_{DS(on)}$	-	35 46	46	mΩ	V_{GS}=18V, I_D=15A T_j=25°C T_j=175°C
Gate resistance	R_g	-	1.5	5	Ω	V_{GS}=0V, V_{DS}=0V, f=1MHz
Dynamic Characteristic[2]						
Input Capacitance	C_{iss}	-	1450	-	pF	V_{GS}=0V, V_{DS}=500V, f=1MHz
Output Capacitance	C_{oss}	-	115	-		
Reverse Transfer Capacitance	C_{rss}	-	8	-		
Gate Total Charge	Q_g	-	72	-	nC	V_{GS}=-5/18V, V_{DS}=400V, I_D=15A, f=1MHz
Gate-Source charge	Q_{gs}	-	20	-		
Gate-Drain charge	Q_{gd}	-	9	-		
Turn-on delay time	$t_{d(on)}$	-	14	-	ns	V_{GS}=-4/18V, ID=33.5A, V_{DD}=400V, R_{G_ext}=2.5Ω L=200μH
Rise time	t_r	-	14	-		
Turn-off delay time	$t_{d(off)}$	-	25	-		
Fall time	t_f	-	8	-		
Turn-On Energy	E_{on}	-	66	-	μJ	
Turn-Off Energy	E_{off}	-	31	-		

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Body Diode Characteristic

Parameter	Symbol	Value			Unit	Test Condition
		min.	typ.	max.		
Body Diode Forward Voltage	V_{SD}	-	3.7 3.2	5.2	V	V_{GS}=-5V,I_{SD}=15A T_j=25°C T_j=175°C
Diode continuous forward current	I_s		48 27	- -	A	V_{GS}=-5V T_C = 25°C T_C = 100°C
Diode Peak reverse recovery Current	I_{rrm}	-	32	-	A	VGS=-5V,V_R=500V I_{SD}=15A, dI/dt=4000A/μs
Body Diode Reverse Recovery Time[2]	t_{rr}	-	15	-	ns	
Body Diode Reverse Recovery Charge[2]	Q_{rr}	-	0.24	-	μC	

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

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Typical Performance Characteristics

Fig 1: Output Characteristics Tj=-55 ℃

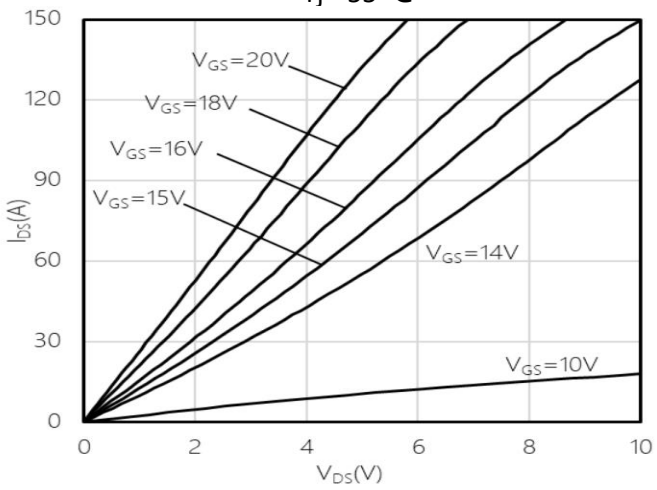


Fig 2: Output Characteristics Tj=25℃

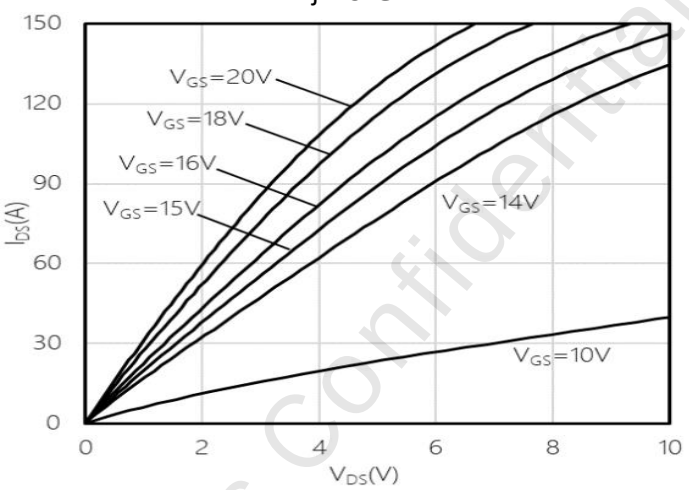


Fig 3: Output Characteristics Tj=175 ℃

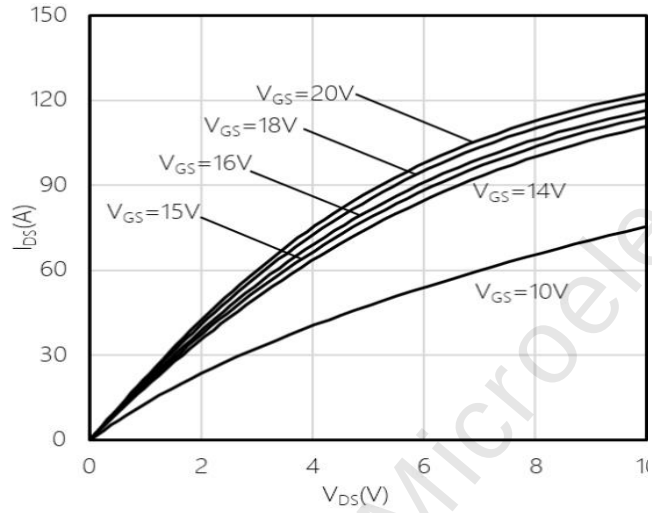


Fig 4: Normalized Rds(on) vs Temperature

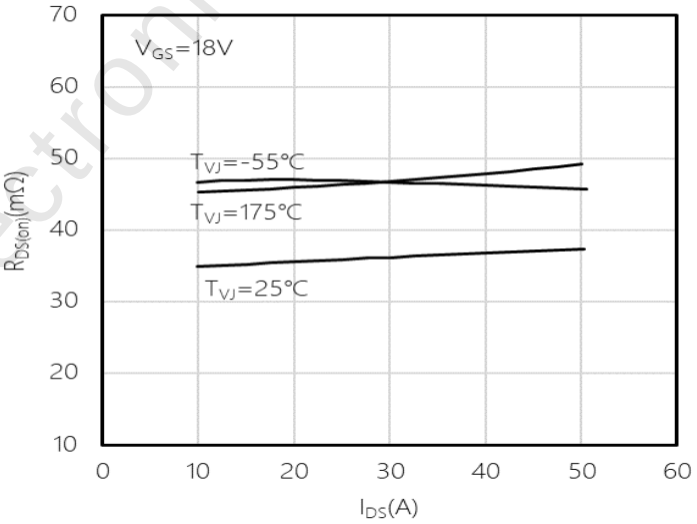
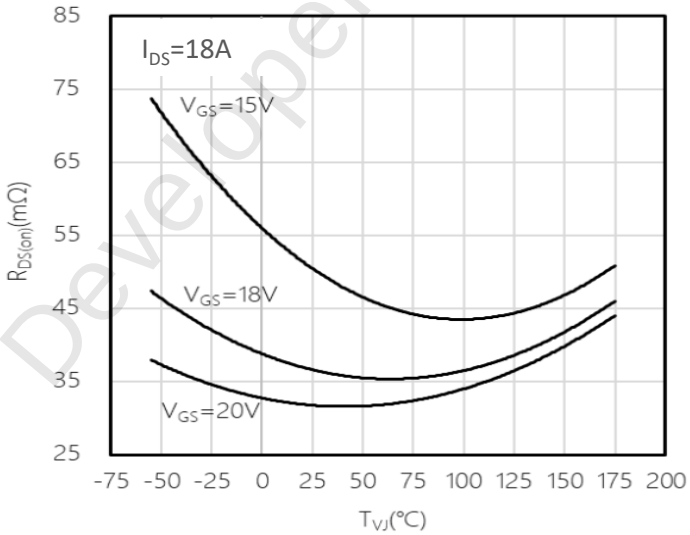
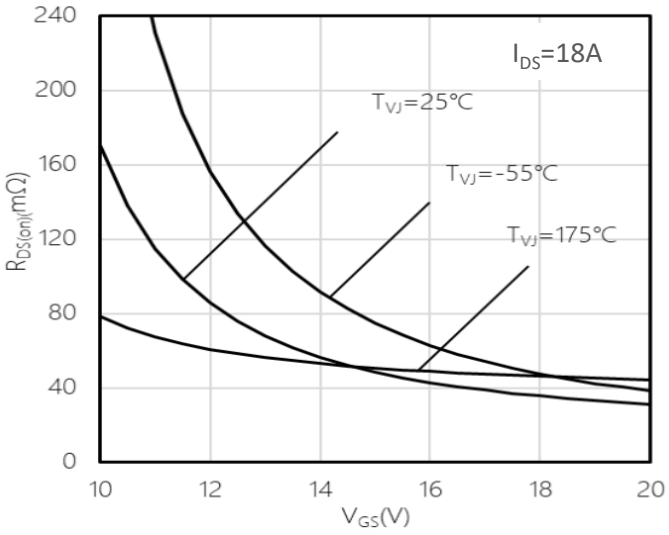


Fig 5: Rds(on) vs Drain Current for various Temperature

Fig 6: Rds(on) vs. Gate Voltage at Temperature





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Typical Performance Characteristics

Fig 7: Transfer Characteristics

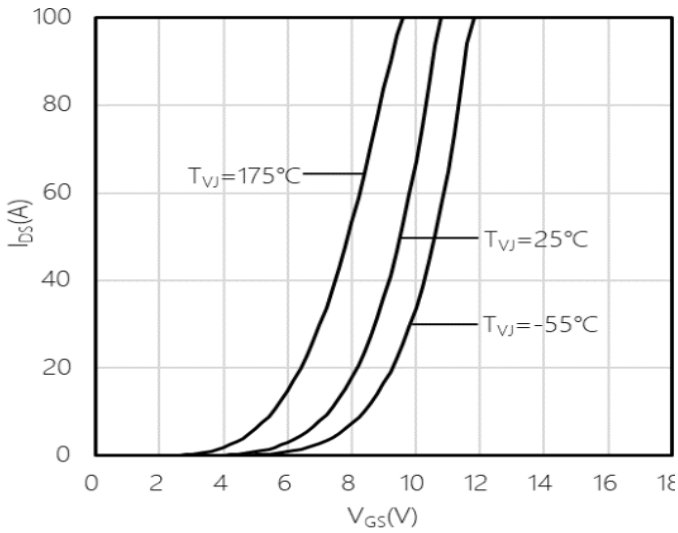


Fig 8: Body Diode Characteristic Tj=-55℃

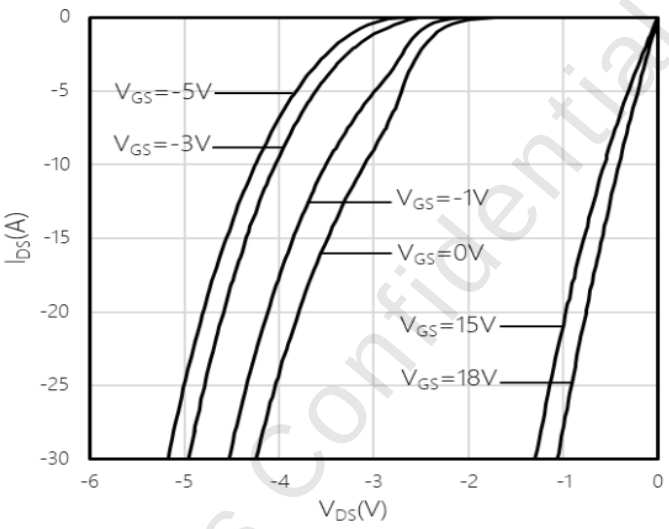


Fig 9: Body Diode Characteristic Tj=25℃

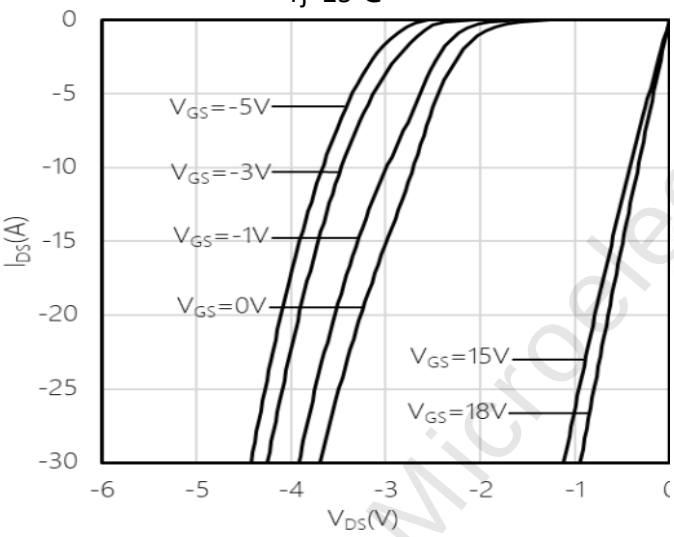


Fig 10: Body Diode Characteristic Tj=175℃

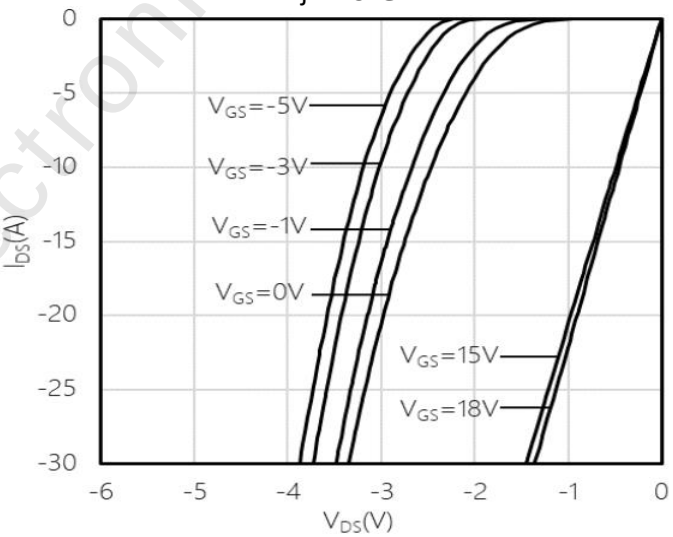


Fig 11: Threshold Voltage vs. Temperature

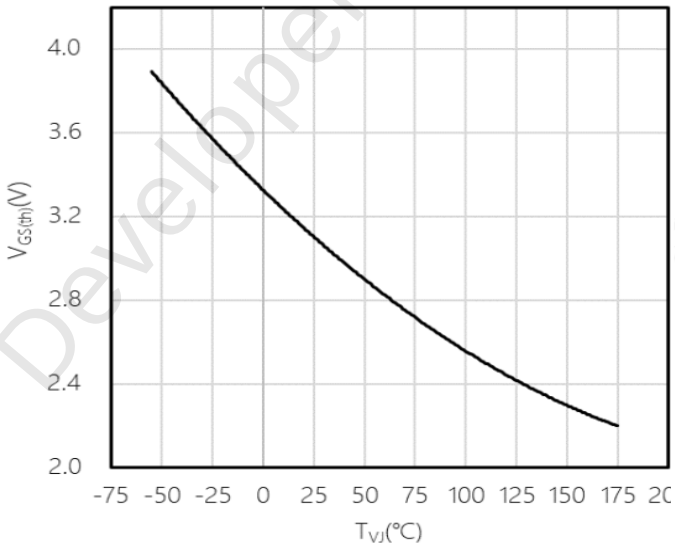
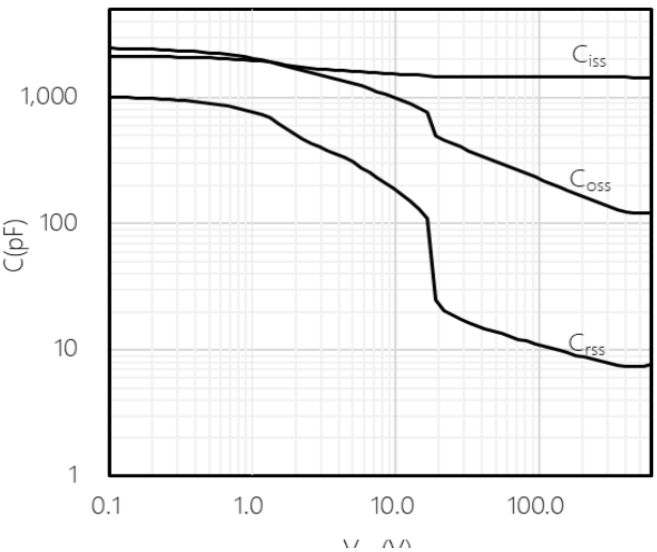


Fig 12: Capacitance Characteristics



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Fig 13: Gate Charge Characteristics

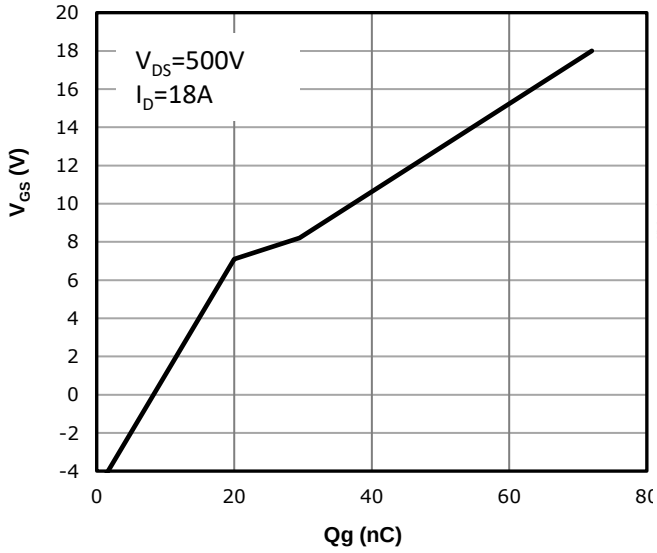


Fig 14: Clamped Inductive Switching energy vs Rg

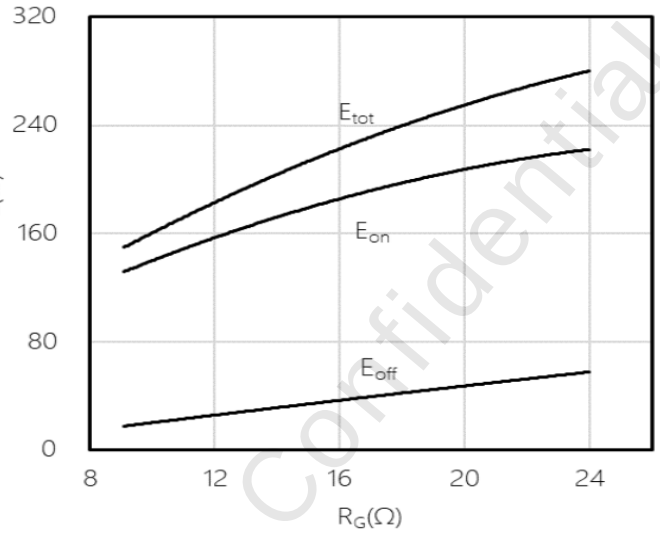


Fig 15: Power Dissipation

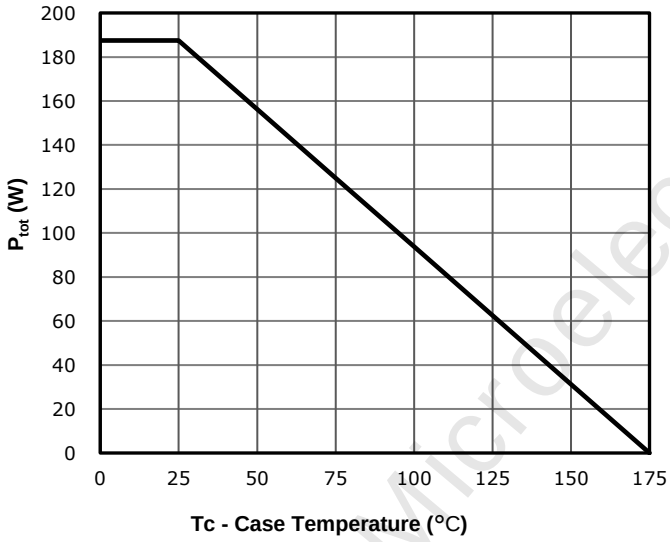


Fig 16: Drain Current Derating

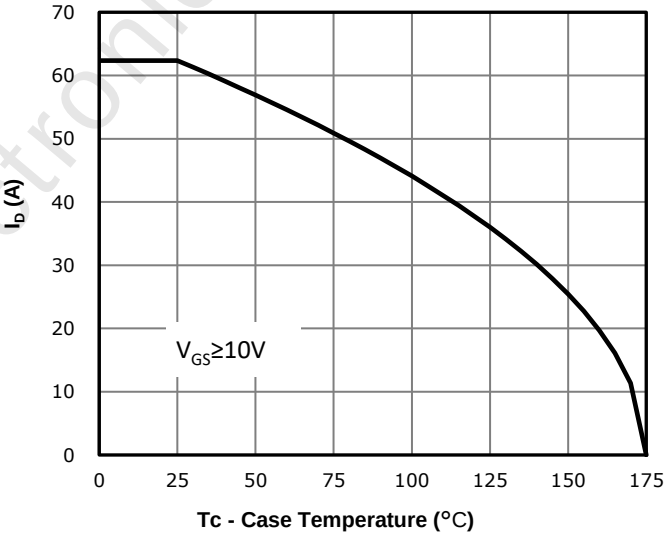
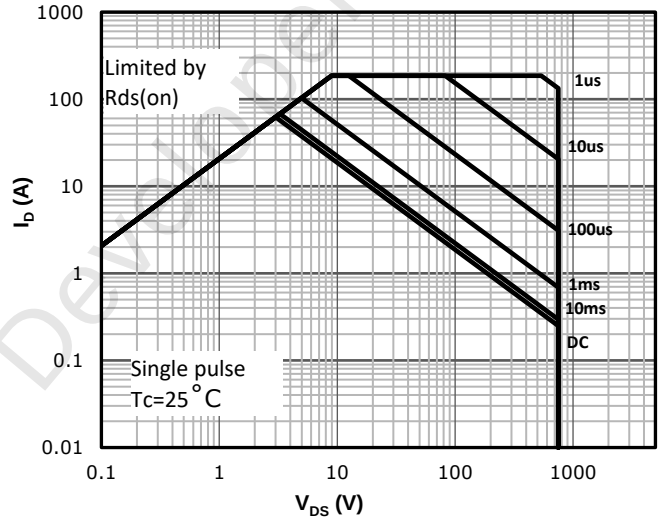
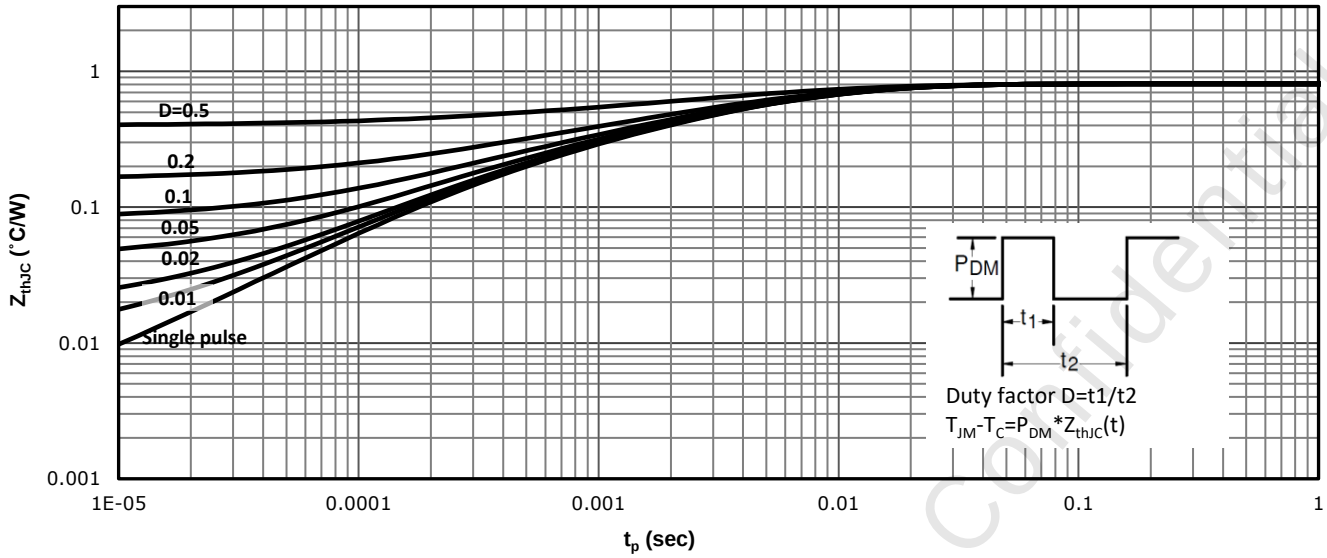


Fig 17: Safe Operating Area



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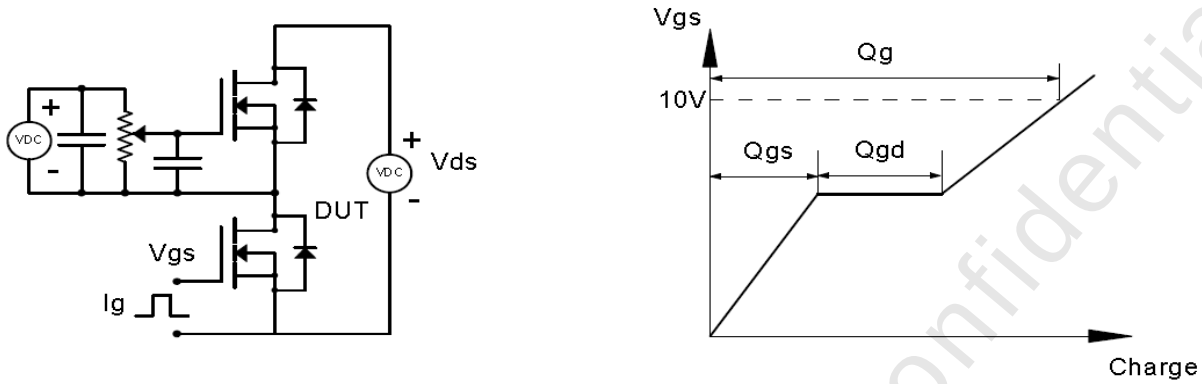
Fig 18: Max. Transient Thermal Impedance



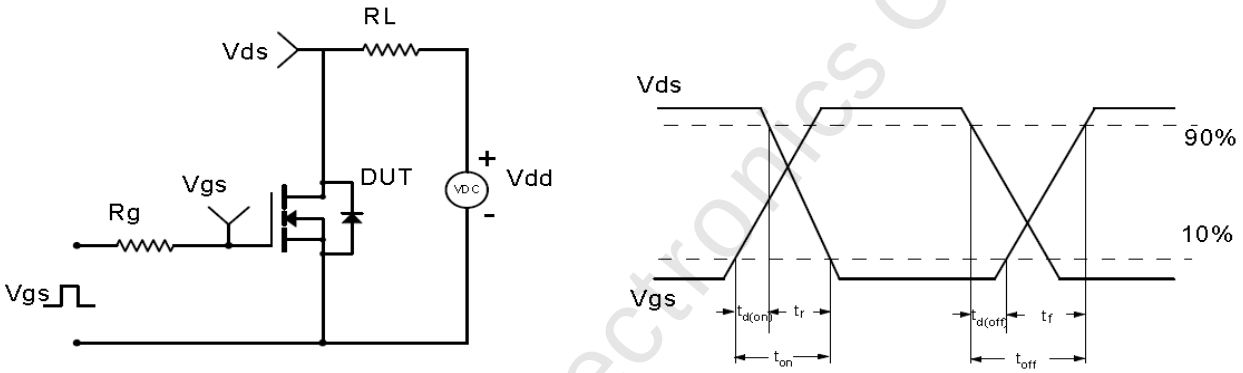
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Test Circuit & Waveform

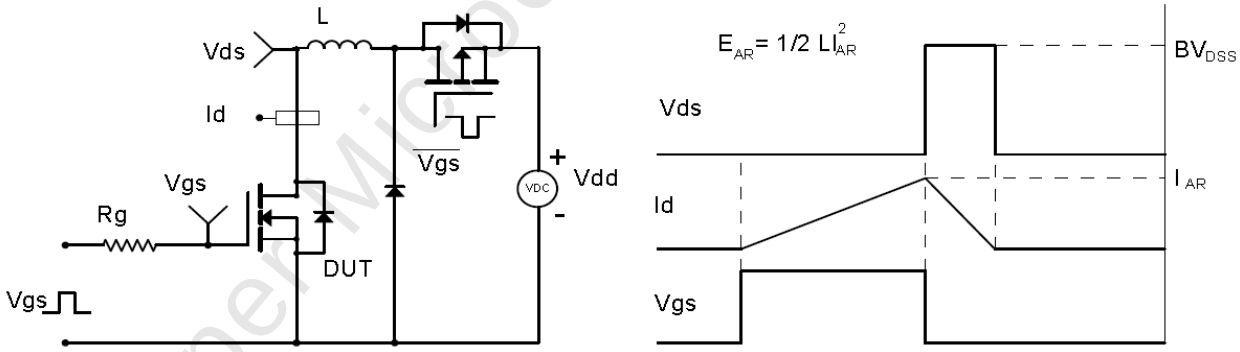
Gate Charge Test Circuit & Waveform



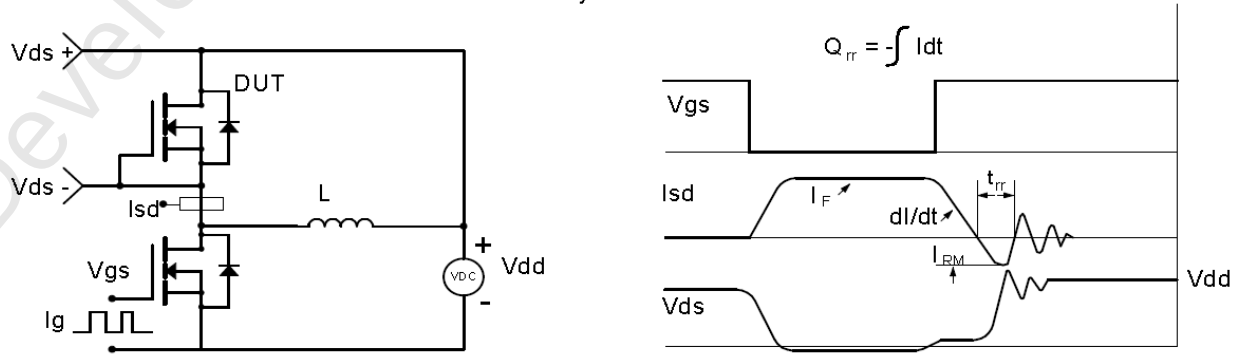
Resistive Switching Test Circuit & Waveforms



Unclamped Inductive Switching (UIS) Test Circuit & Waveforms

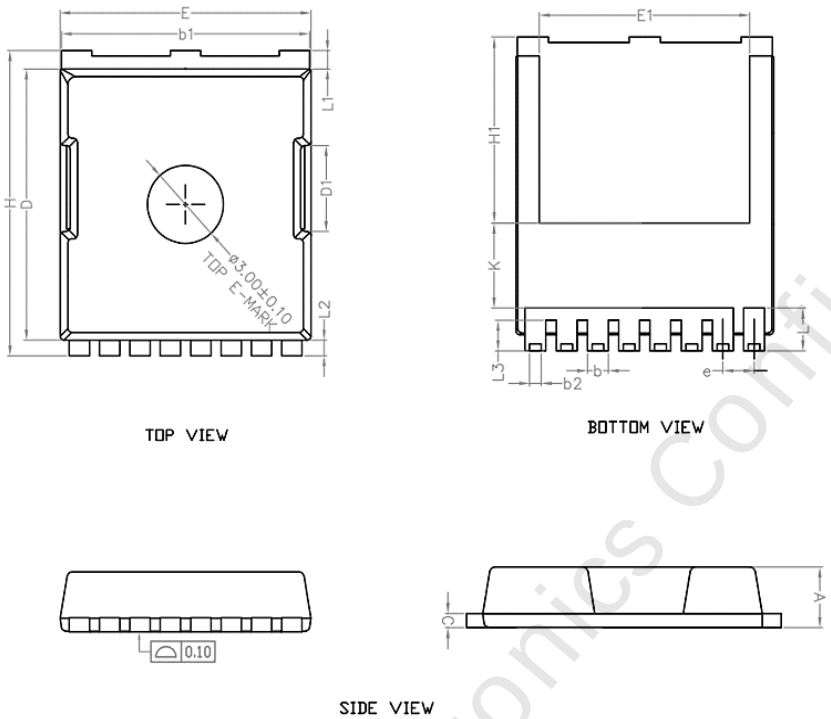


Diode Recovery Test Circuit & Waveforms



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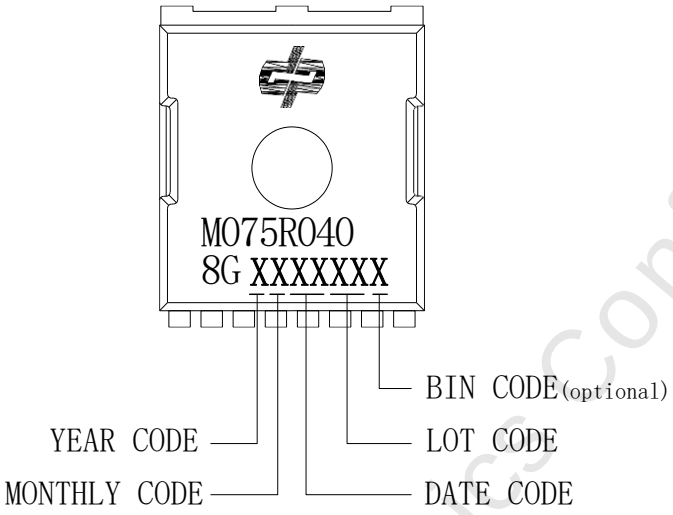
Package Outline: TOLL



Symbol	Common Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	2.20	2.40	0.09	0.09
b	0.70	0.90	0.03	0.04
b1	9.70	9.90	0.38	0.39
b2	0.40	0.50	0.02	0.02
c	0.40	0.60	0.02	0.02
D	10.28	10.58	0.40	0.42
D1	3.15	3.45	0.12	0.14
E	9.70	10.10	0.38	0.40
E1	7.90	8.30	0.31	0.33
e	1.10	1.30	0.04	0.05
H	11.48	11.88	0.45	0.47
H1	6.75	7.15	0.27	0.28
K	3.03	3.33	0.12	0.13
L	1.50	1.70	0.06	0.07
L1	0.55	0.85	0.02	0.03
L2	0.45	0.75	0.02	0.03
L3	1.00	1.30	0.04	0.05

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Part Marking Information



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Revision History

Revison	Major changes
1.0	Release for formal version1.0

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