WGN01V40

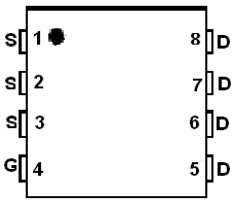
PDFN5X6-8L

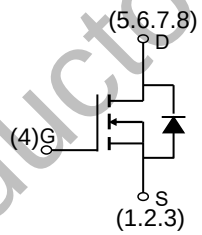
RoHS COMPLIANT

Features:

- ☐ Low Intrinsic Capacitances.
- ☐ Excellent Switching Characteristics.
- ☐ Extended Safe Operating Area.
- ☐ Unrivalled Gate Charge :Qg=123 nC (Typ.).
- ☐ BVDSS=40V,I_D= 330A
- ☐ R_{DS}(on) : 0.9mΩ (Typ.) @V_G=10V
- ☐ 100% Avalanche Tested

Schematic diagram





Absolute Maximum Ratings (@ T_C = 25°C unless otherwise specified)

Symbol	Parameter		Value	Unit
V_{DS}	Drain-to-Source Voltage		40	V
V_{GS}	Gate-to-Source Voltage		±20	V
I_D	Continuous Drain Current	T_C = 25°C	330	A
		T_C = 100°C	208	
I_{DM}	Pulsed Drain Current (1)		Refer to Fig.4	A
E_{AS}	Single Pulsed Avalanche Energy (2)		265	mJ
P_D	Power Dissipation	T_C = 25°C	156	W
		T_C = 100°C	63	
T_J, T_{STG}	Junction & Storage Temperature Range		-55 to 150	°C

Thermal Characteristics

Symbol	Parameter	Max	Unit
$R_{\theta JA}$	Thermal Resistance, Junction to Ambient(3)	39	°C/W
$R_{\theta JC}$	Thermal Resistance, Junction to Case	0.8	

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Electrical Characteristics (T_J = 25°C unless otherwise specified)

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
Off Characteristics						
$V_{(BR)DSS}$	Drain-Source Breakdown Voltage	I_D = 250μA, V_{GS} = 0V	40	-	-	V
I_{DSS}	Zero Gate Voltage Drain Current	V_{DS} = 32V, V_{GS} = 0V	-	-	1.0	μA
I_{GSS}	Gate-Body Leakage Current	V_{DS} = 0V, V_{GS} = ±20V	-	-	±100	nA
On Characteristics						
$V_{GS(th)}$	Gate Threshold Voltage	V_{DS} = V_{GS}, I_D = 250μA	1.0	1.7	2.5	V
$R_{DS(ON)}$	Static Drain-Source ON-Resistance(4)	V_{GS} = 10V, I_D = 40A	-	0.9	1.2	mΩ
		V_{GS} = 4.5V, I_D = 15A				
Dynamic Characteristics						
R_g	Gate Resistance	f = 1MHz	-	1.2	-	Ω
C_{iss}	Input Capacitance	V_{GS} = 0V, V_{DS} = 20V, f = 1MHz	5486	7681	10369	pF
C_{oss}	Output Capacitance		2545	3563	4810	pF
C_{rss}	Reverse Transfer Capacitance		171	240	324	pF
Q_g	Total Gate Charge	V_{GS} = 0 to 10V V_{DS} = 20V, I_D = 20A	88	123	166	nC
Q_{gs}	Gate Source Charge		15	21	28	nC
Q_{gd}	Gate Drain("Miller") Charge		17	24	32	nC
Switching Characteristics						
$t_{d(on)}$	Turn-On DelayTime	V_{GS} = 10V, V_{DD} = 20V I_D= 20A, R_{GEN} = 3Ω	-	17	-	ns
t_r	Turn-On Rise Time		-	36	-	ns
$t_{d(off)}$	Turn-Off DelayTime		-	83	-	ns
t_f	Turn-Off Fall Time		-	40	-	ns
Body Diode Characteristics						
I_S	Maximum Continuous Body Diode Forward Current		-	-	330	A
I_{SM}	Maximum Pulsed Body Diode Forward Current		-	-	1318	A
V_{SD}	Body Diode Forward Voltage	V_{GS} = 0V, I_S = 20A	-		1.2	V
trr	Body Diode Reverse Recovery Time	I_F = 20A, di/dt = 100A/us	51	72	97	ns
Qrr	Body Diode Reverse Recovery Charge		-	117	-	nC

Notes: 1. Repetitive Rating: Pulse Width Limited by Maximum Junction Temperature.

2. E_{AS} condition: Starting T_J=25C, V_{DD}=20V, V_{GS}=10V, R_G=25ohm, L=3mH, I_{AS}=13.3A, V_{DD}=0V during time in avalanche.

3. $R_{\theta JA}$ is measured with the device mounted on a 1inch^2 pad of 2oz copper FR4 PCB.

4. Pulse Test: Pulse Width≤300μs, Duty Cycle≤0.5%.

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Typical Performance Characteristics

Figure 1: Power De-rating

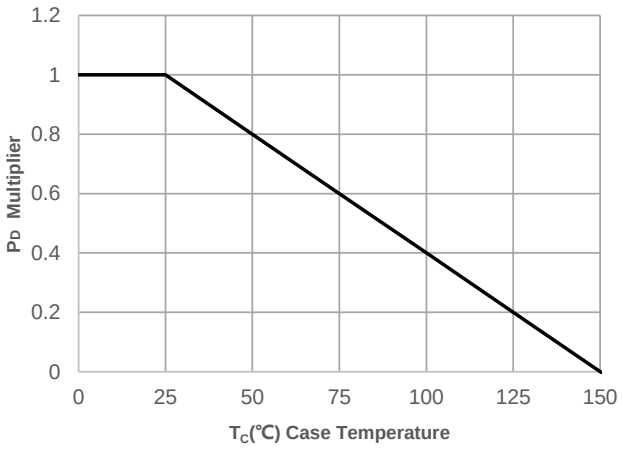


Figure 2: Current De-rating

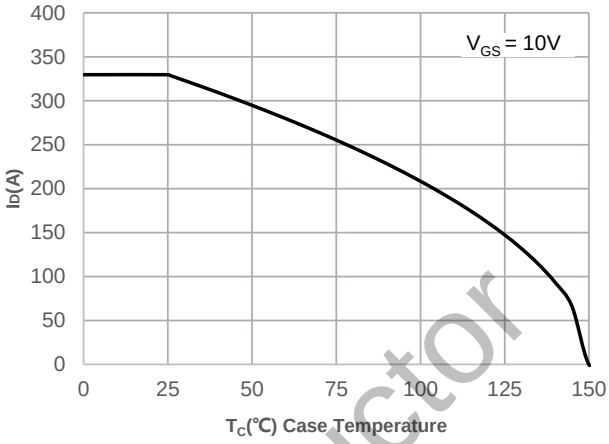


Figure 3: Normalized Maximum Transient Thermal Impedance

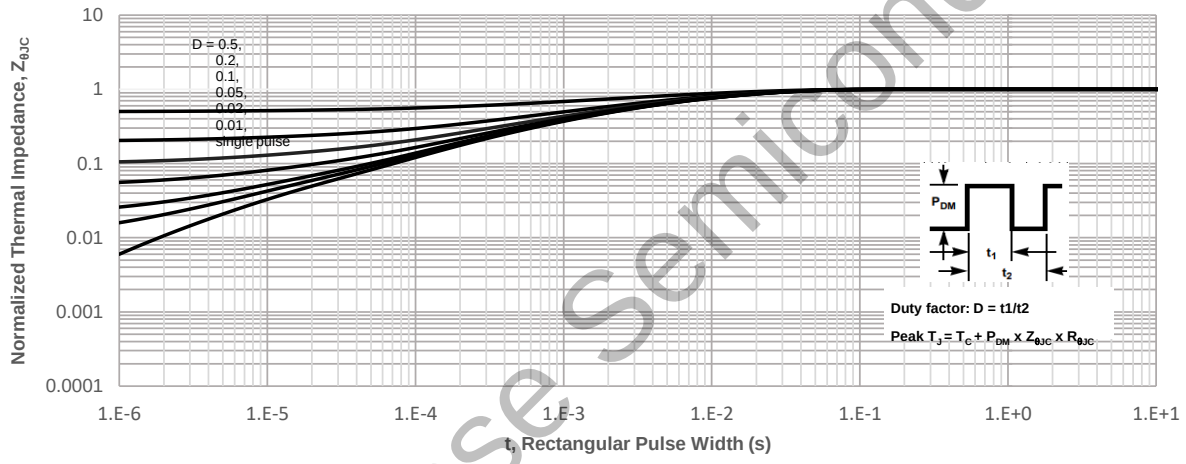
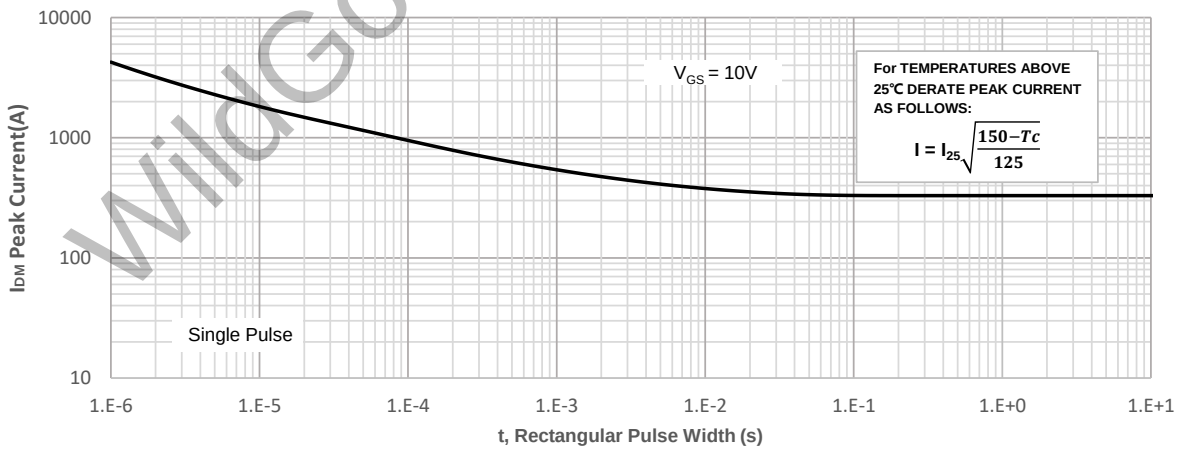


Figure 4: Peak Current Capacity



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Typical Performance Characteristics

Figure 5: Output Characteristics

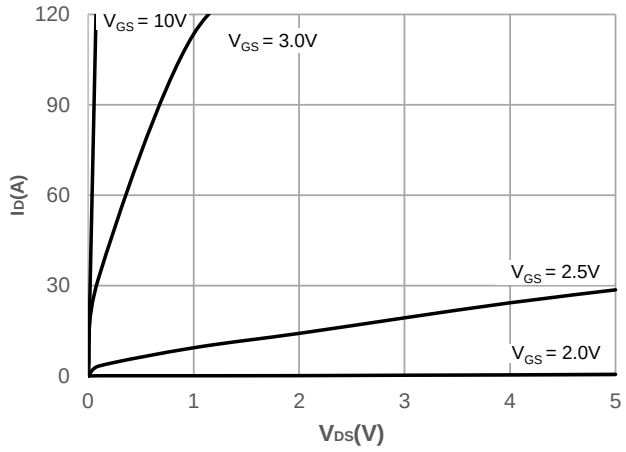


Figure 6: Typical Transfer Characteristics

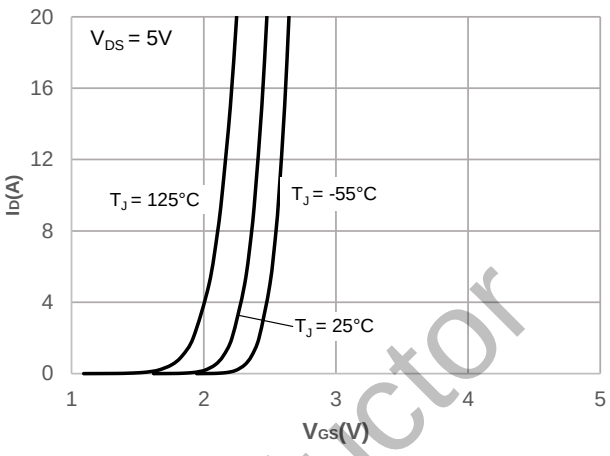


Figure 7: On-resistance vs. Drain Current

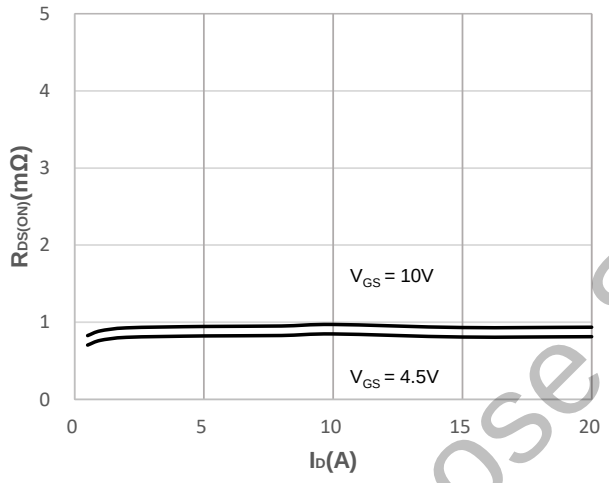


Figure 8: Body Diode Characteristics

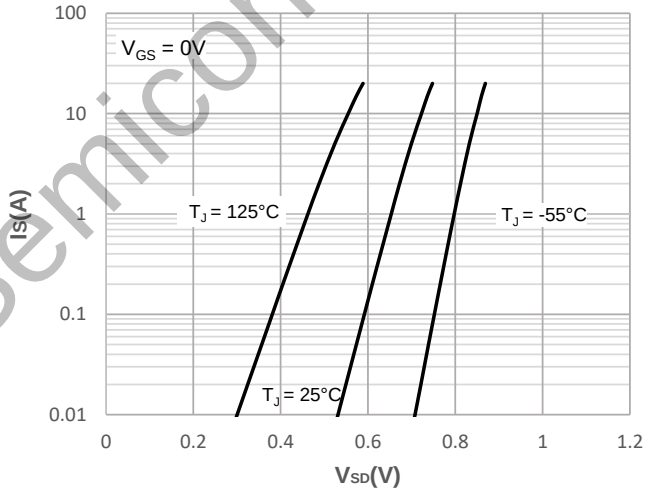


Figure 9: Gate Charge Characteristics

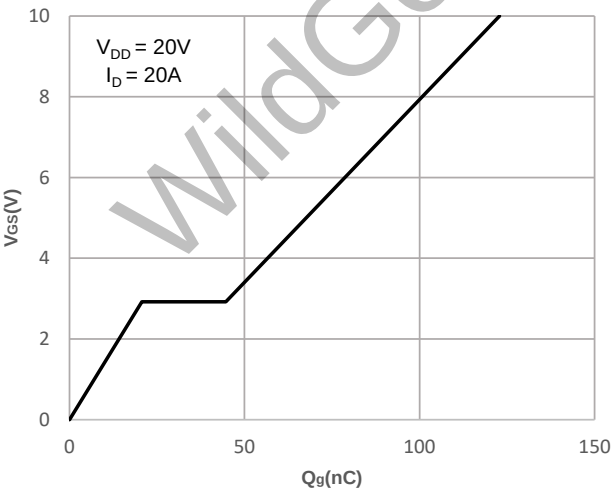
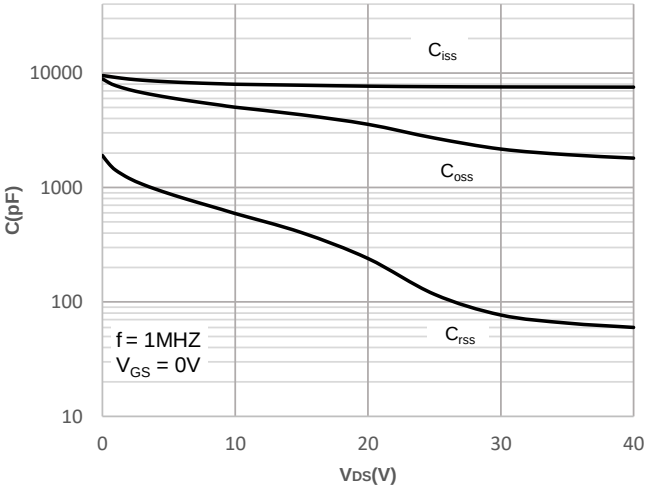


Figure 10: Capacitance Characteristics



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Typical Performance Characteristics

Figure 11: Normalized Breakdown voltage vs. Junction Temperature

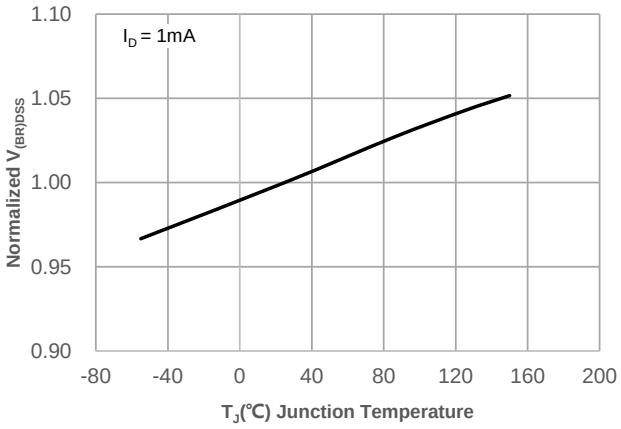


Figure 12: Normalized on Resistance vs. Junction Temperature

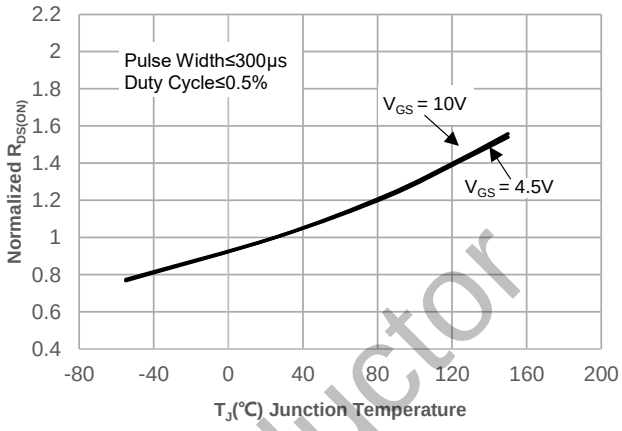


Figure 13: Normalized Threshold Voltage vs. Junction Temperature

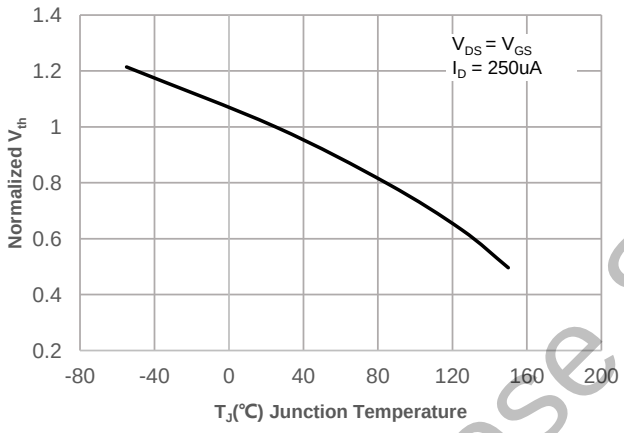


Figure 14: $R_{DS(ON)}$ vs. V_{GS}

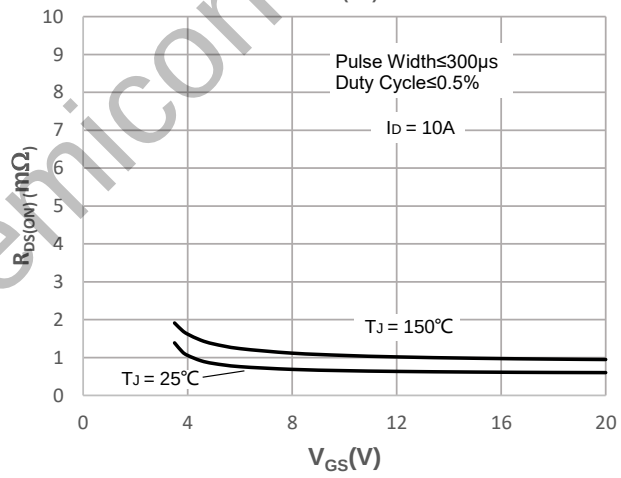
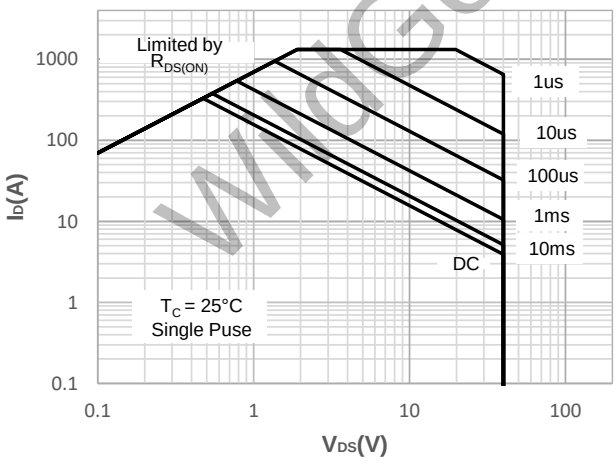


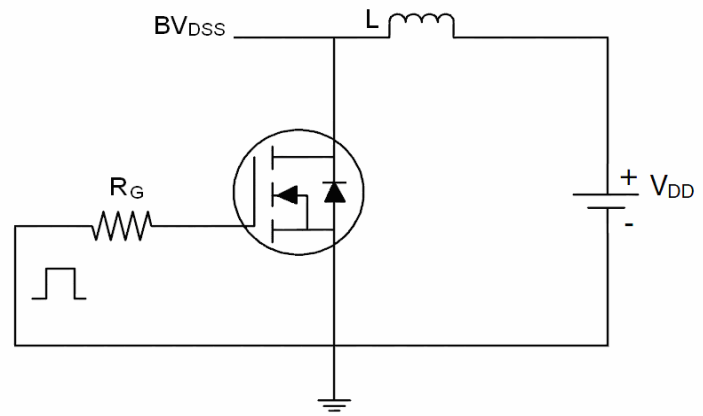
Figure 15: Maximum Safe Operating Area



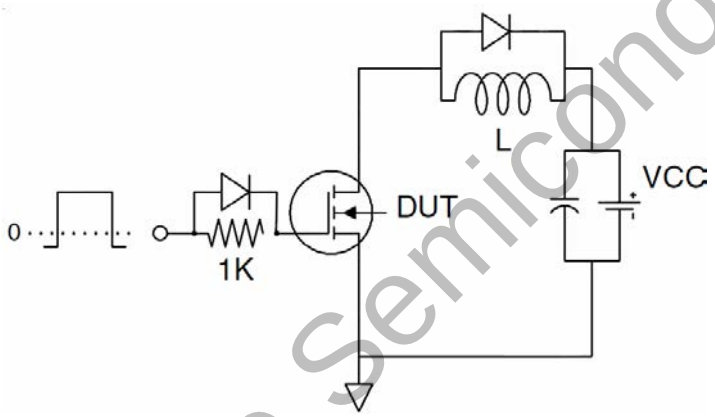
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Test Circuit

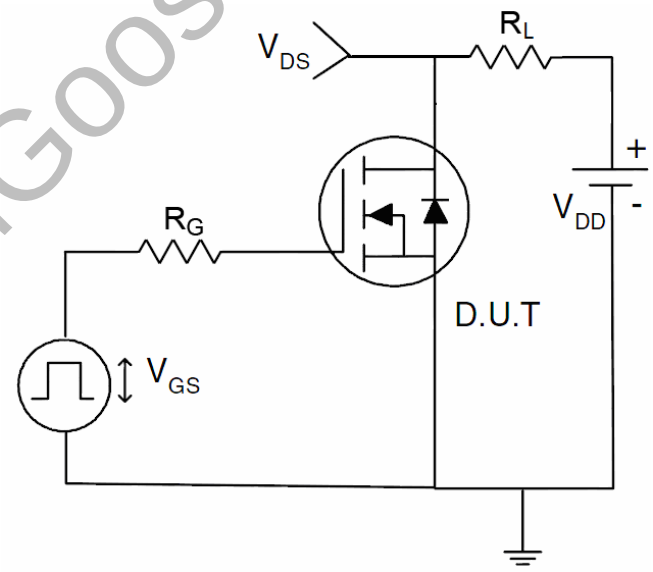
1) $_{AS}$ test Circuit



2) Gate c rge test Circuit



3) witch Time Test Circuit

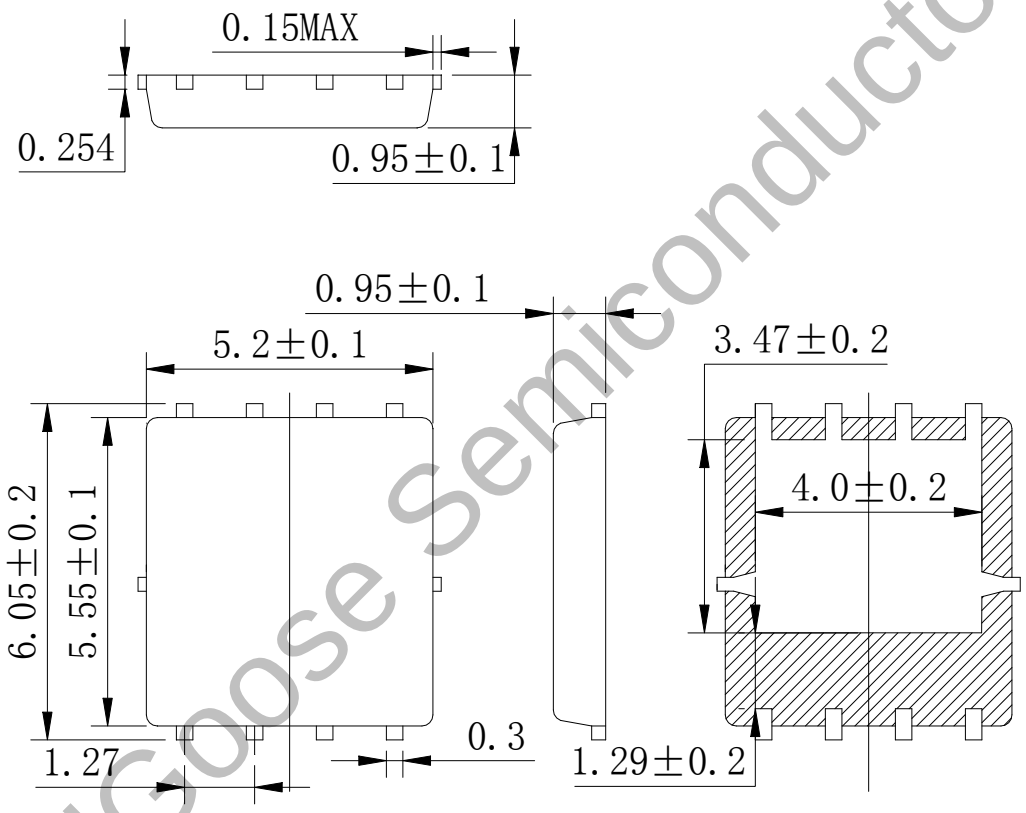


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Package Dimension

PDFN5X6-8L

Unit:mm



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