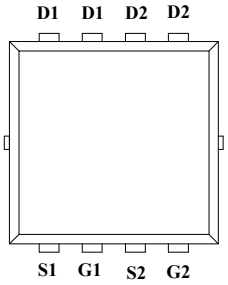
WGEM16V30

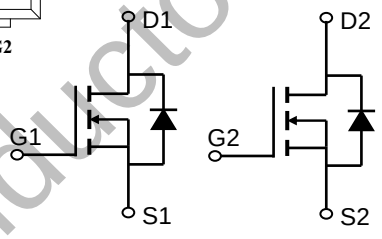
DFN3X3

RoHS COMPLIANT



Features:

- ☐ Advanced Trench Technology
- ☐ Unrivalled Gate Charge :Qg= 11nC (Typ.).
- ☐ BVDSS=30V,I_D=20A
- ☐ R_{DS}(on) : 18m Ω (Typ.) @V_G=10V
- ☐ 100% Avalanche Tested



Schematic Diagram

Absolute Maximum Ratings (T_A=25℃ unless otherwise specified)

Symbol	Parameter		Max.	Units
V_{DSS}	Drain-Source Voltage		30	V
V_{GSS}	Gate-Source Voltage		±20	V
I_D	Continuous Drain Current	T_A= 25℃	20	A
		T_A= 100℃	7.8	A
I_{DM}	Pulsed Drain Current note1		35	A
EAS	Single Pulsed Avalanche Energy note2		21	mJ
P_D	Power Dissipation	T_A= 25℃	15	W
$R_{\theta JA}$	Thermal Resistance, Junction to Ambient		66	℃/W
T_J, T_{STG}	Operating and Storage Temperature Range		-55 to +150	℃

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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	30	-	-	V
I_{DSS}	Zero Gate Voltage Drain Current	V_{DS} = 30V, 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	1.2	1.8	2.3	V
$R_{DS(ON)}$	Static Drain-Source ON-Resistance(4)	V_{GS} = 10V, I_D = 5.5A	-	18	23	mΩ
		V_{GS} = 4.5V, I_D = 4.5A	-	25	32	mΩ
Dynamic Characteristics						
R_g	Gate Resistance	f = 1MHz	-	3	-	Ω
C_{iss}	Input Capacitance	V_{GS} = 0V, V_{DS} = 15V, f = 1MHz	302	503	705	pF
C_{oss}	Output Capacitance		42	70	98	pF
C_{rss}	Reverse Transfer Capacitance		33	55	77	pF
Q_g	Total Gate Charge	V_{GS} = 0 to 10V, V_{DS} = 15V, I_D = 4.5A	-	11	-	nC
Q_{gs}	Gate Source Charge		-	1.9	-	nC
Q_{gd}	Gate Drain("Miller") Charge		-	2.3	-	nC
Switching Characteristics						
$t_{d(on)}$	Turn-On DelayTime	V_{GS} = 10V, V_{DD} = 15V, I_D= 4.5A, R_{GEN} = 3Ω	-	7	-	ns
t_r	Turn-On Rise Time		-	15	-	ns
$t_{d(off)}$	Turn-Off DelayTime		-	13	-	ns
t_f	Turn-Off Fall Time		-	6	-	ns
Body Diode Characteristics						
I_S	Maximum Continuous Body Diode Forward Current		-	-	20	A
I_{SM}	Maximum Pulsed Body Diode Forward Current		-	-	35	A
V_{SD}	Body Diode Forward Voltage	V_{GS} = 0V, I_S = 5.5A	-		1.2	V
trr	Body Diode Reverse Recovery Time	I_F = 4.5A, di/dt = 100A/us	-	8	-	ns
Qrr	Body Diode Reverse Recovery Charge		-	2.8	-	nC

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

2. $R_{\theta JA}$ is measured with the device mounted on a minimum recommended pad of 2oz copper FR4 PCB.

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

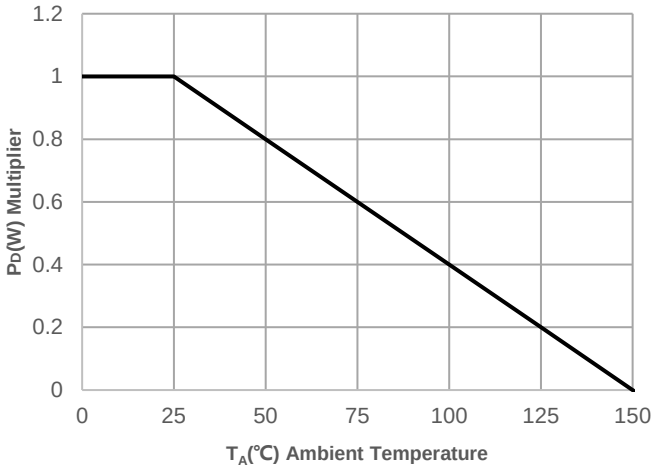


Figure 2: Current De-rating

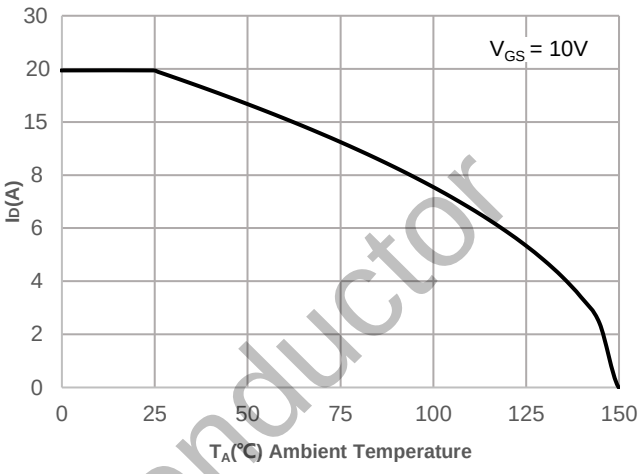
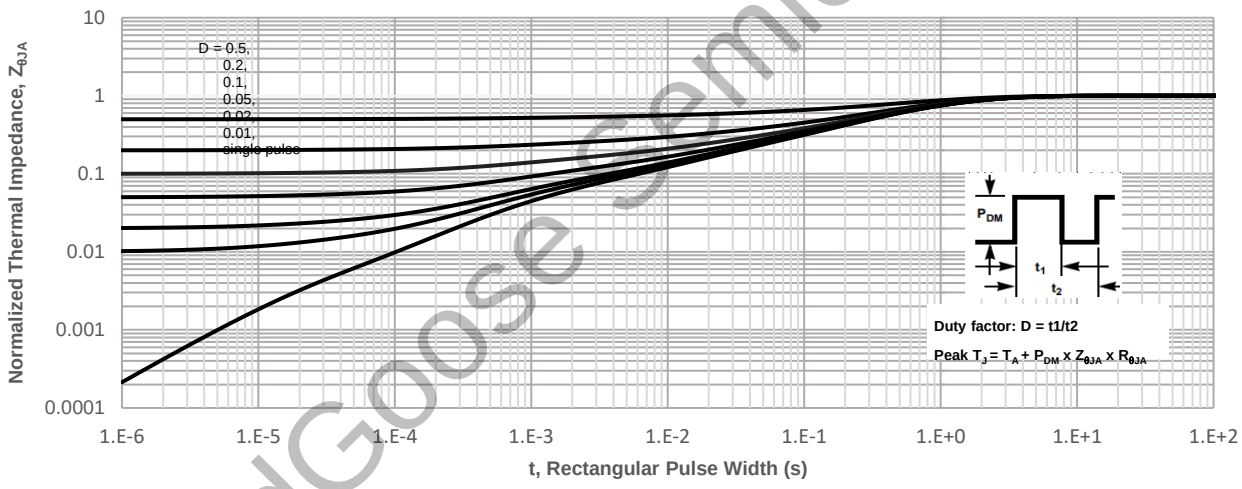


Figure 3: Normalized Maximum Transient Thermal Impedance



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Typical Performance Characteristics

Figure 5: Output Characteristics

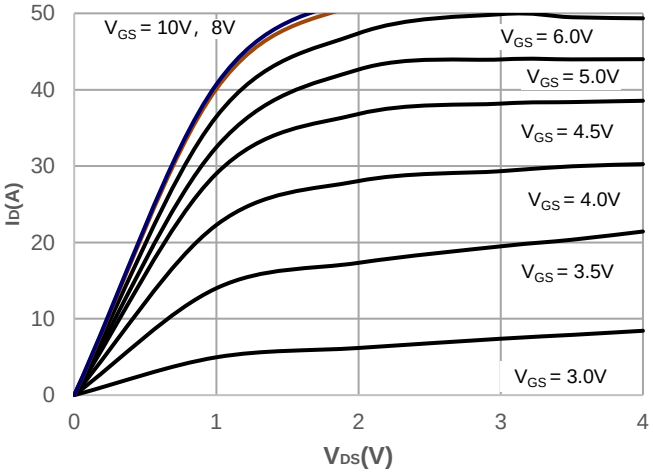


Figure 6: Typical Transfer Characteristics

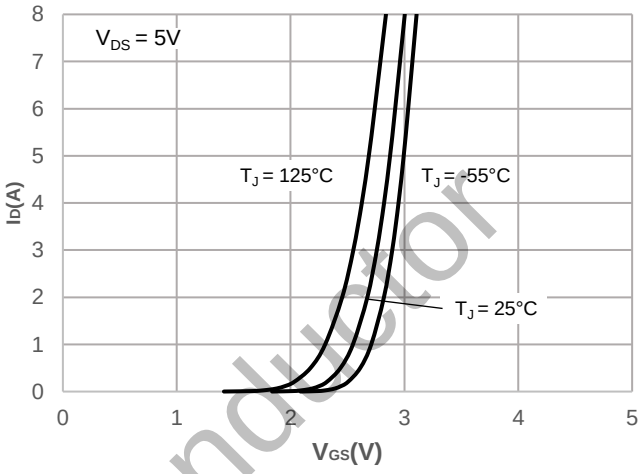


Figure 7: On-resistance vs. Drain Current

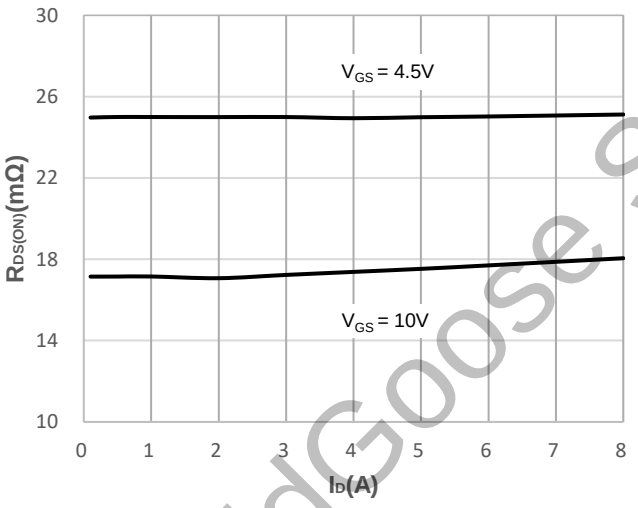


Figure 8: Body Diode Characteristics

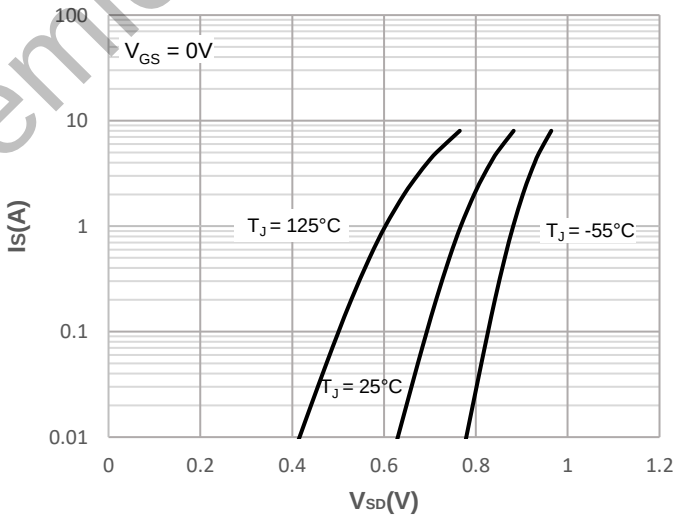


Figure 9: Gate Charge Characteristics

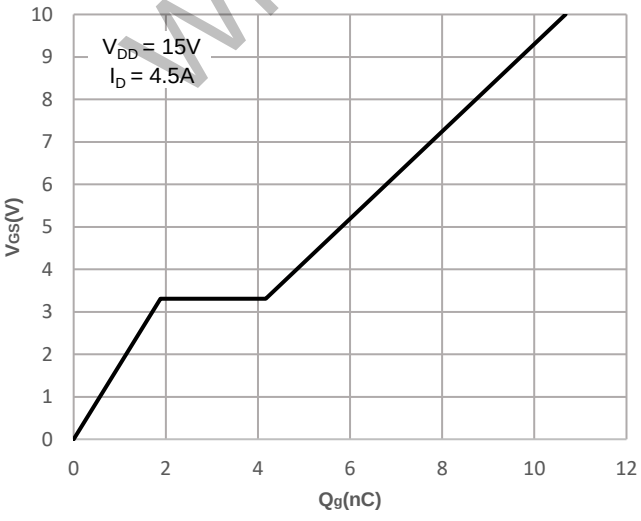
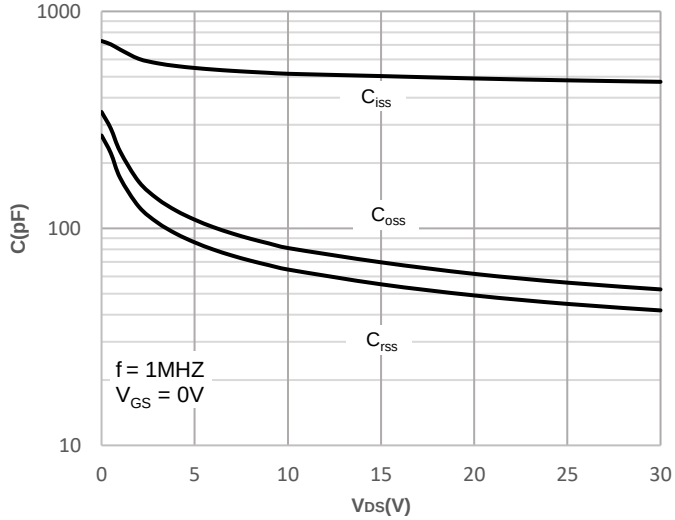


Figure 10: Capacitance Characteristics



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Typical Performance Characteristics

Figure 11: Normalized Breakdown voltage vs. Junction Temperature

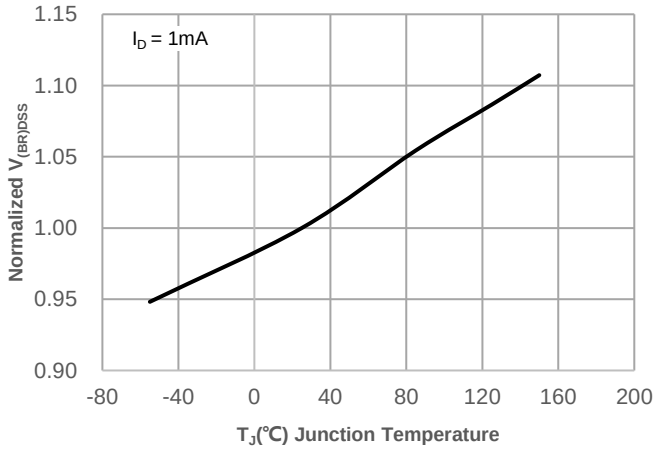


Figure 12: Normalized on Resistance vs. Junction Temperature

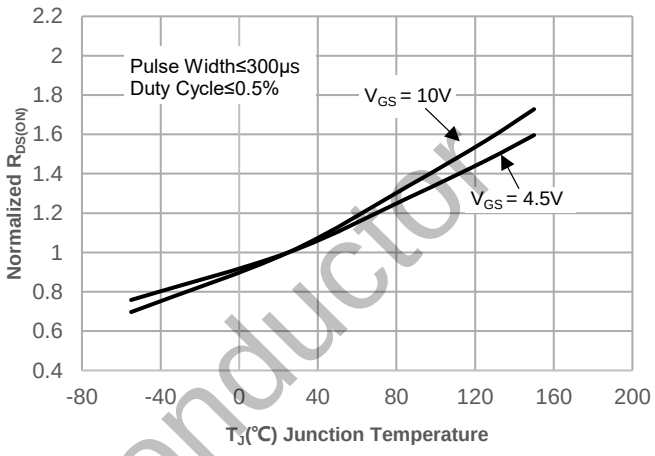


Figure 13: Normalized Threshold Voltage vs. Junction Temperature

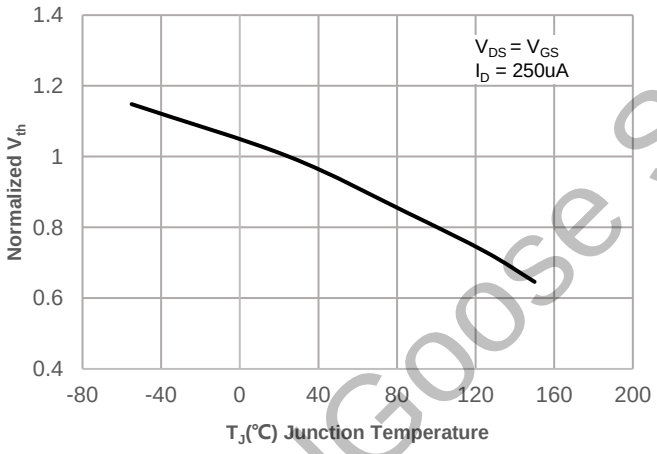


Figure 14: $R_{DS(ON)}$ vs. V_{GS}

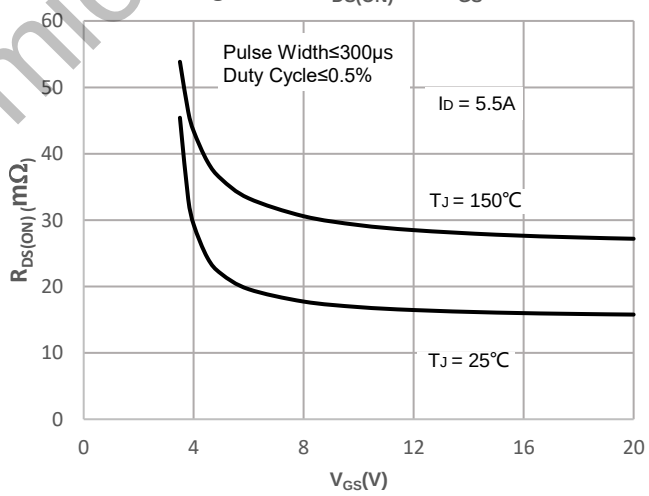
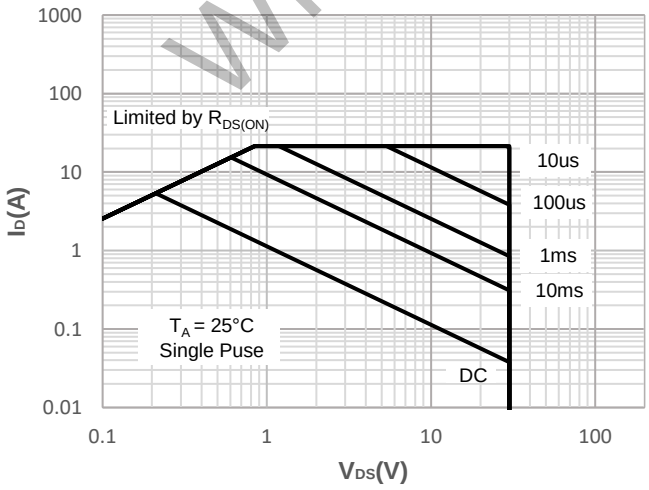


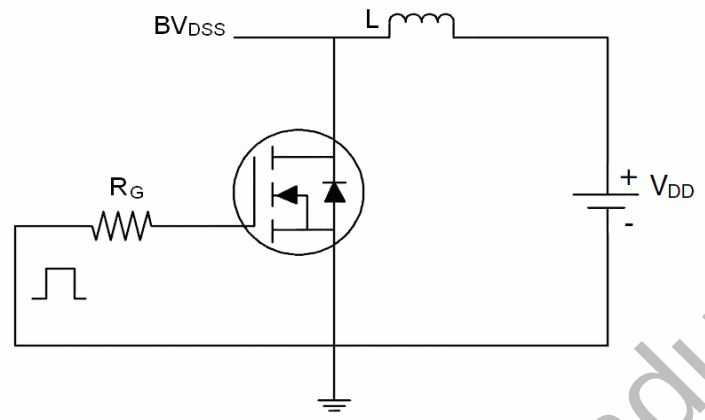
Figure 15: Maximum Safe Operating Area



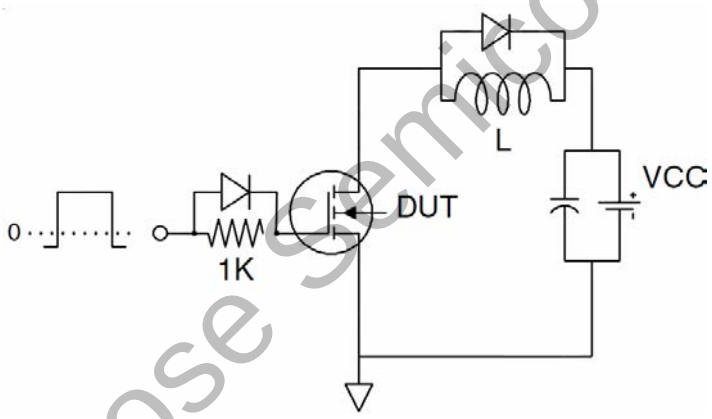
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Test Circuit

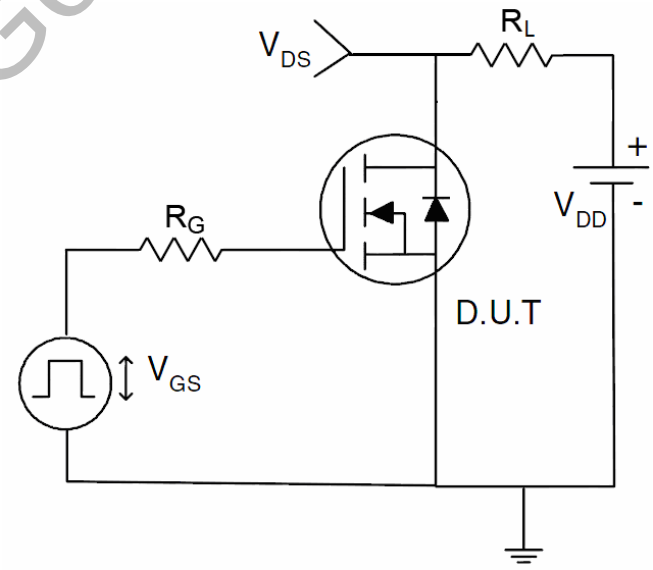
1) $_{AS}$ test Circuit



2) Gate c rge test Circuit



3) witch Time Test Circuit

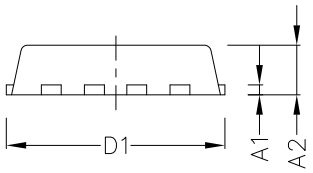


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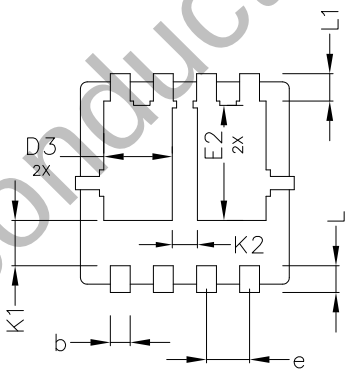
Package Dimension

PDFN3X3

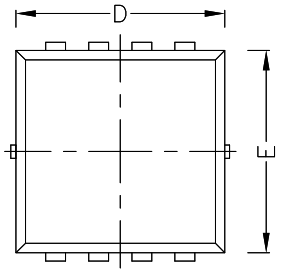
Unit: mm



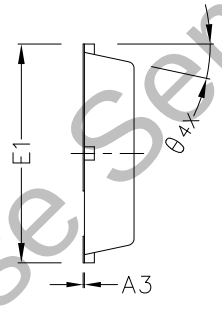
SIDE VIEW



BOTTOM VIEW



TOP VIEW



SIDE VIEW

COMMON DIMENSIONS
(UNITS OF MEASURE IS mm)

		MIN	NORMAL	MAX
	A1	0.152 BSC		
	A2	0.650	0.750	0.850
6	A3	0.005	–	0.020
	b	0.250	0.300	0.350
	D	3.050	3.150	3.250
	D1	3.200	3.300	3.400
	D2	2.350	2.450	2.550
	D3	0.935	1.035	1.135
8	E1	3.150	3.300	3.450
8	E	2.950	3.050	3.150
	E2	1.635	1.735	1.835
	e	0.650 TYPE		
	L	0.300	0.400	0.500
	θ	12° TYPE		
	K1	0.680 REF		
	K2	0.380 REF		
	L1	0.410 REF		

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