

Features

- GaN-on-Silicon E-mode HEMT technology
- Industrial application
- Very low gate charge
- Ultra-low on resistance
- Very small footprint

Applications

- High frequency DC-DC converter
- Solar Systems optimizers and microinverters
- PD Charger and PSU Synchronous Rectification
- Telecom Power Supply
- Motor driver

Product Summary at $T_J = 25^\circ\text{C}$

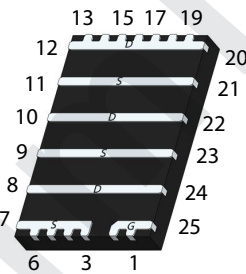
$V_{DS, \text{max}}$	150V
$R_{DS(\text{on}), \text{max}} @ V_{GS} = 5\text{V}$	3.9m Ω
$Q_{g, \text{typ}} @ V_{DS} = 75\text{V}$	20nC
$I_{D, \text{pulse}}$	260A
$Q_{OSS} @ V_{DS} = 75\text{V}$	130nC



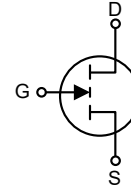
Pin Configuration



Top View



Bottom View



Pin Information

Pin	Pin Description	Pin Function
1, 2, 25	Gate	Driver Gate
3-7, 9, 11, 21, 23	Source	Source
8, 10, 12-20, 22, 24	Drain	Power Drain

Ordering Information

Ordering Part Number	Package Type	Form	Shipping Quantity
AOSE039V15GA1	En-FCQFN 4x6	Tape and Reel	1500

Contact local sales office for full product datasheet.

Absolute Maximum Ratings

($T_J = 25^\circ\text{C}$, unless otherwise noted)

Symbol	Parameter	Max	Units
V_{DS}	Drain-to-Source Voltage (Continuous)	150	V
$V_{DS(tr)}$	Drain-to-Source Voltage (up to 300,000 5ms pulse at 150°C)	180	V
I_D	Continuous Current ($T_A = 25^\circ\text{C}$)	100	A
	Pulsed ($T_A = 25^\circ\text{C}$, $T_{Pulse} = 100\mu\text{s}$)	260	A
V_{GS}	Gate-to-Source Voltage	6	V
	Gate-to-Source Voltage	-4	V
T_J	Operating Temperature	-40 to 150	$^\circ\text{C}$
T_{STG}	Storage Temperature	-40 to 150	$^\circ\text{C}$

Thermal Characteristics

Symbol	Parameter	Typ	Note	Units
$R_{\theta JC}$	Thermal Resistance Junction-to-Case	0.24	-	$^\circ\text{C/W}$
$R_{\theta JB}$	Thermal Resistance Junction-to-Board	1.31	-	$^\circ\text{C/W}$
$R_{\theta JA}$	Thermal Resistance, Junction to Ambient ⁽¹⁾	56.63	-	$^\circ\text{C/W}$
T_{sold}	Maximum Reflow Soldering Temperature	260	MSL3	$^\circ\text{C}$

Note:

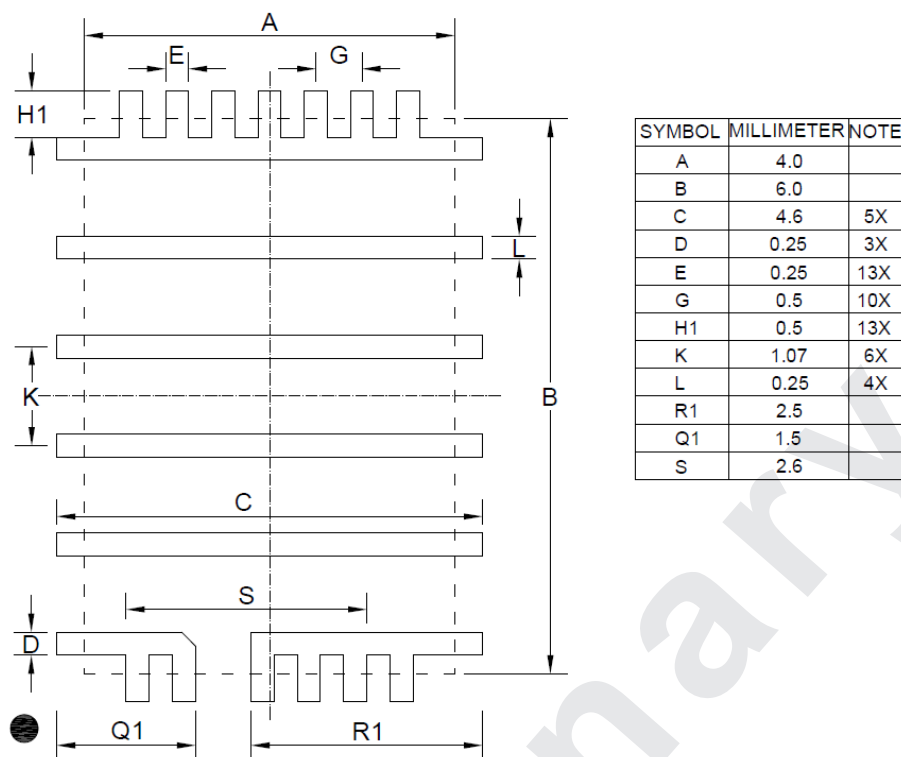
1. $R_{\theta JA}$ is determined with the device mounted on one square inch of copper pad, single layer 2 oz copper on FR4 board.

Electrical Characteristics

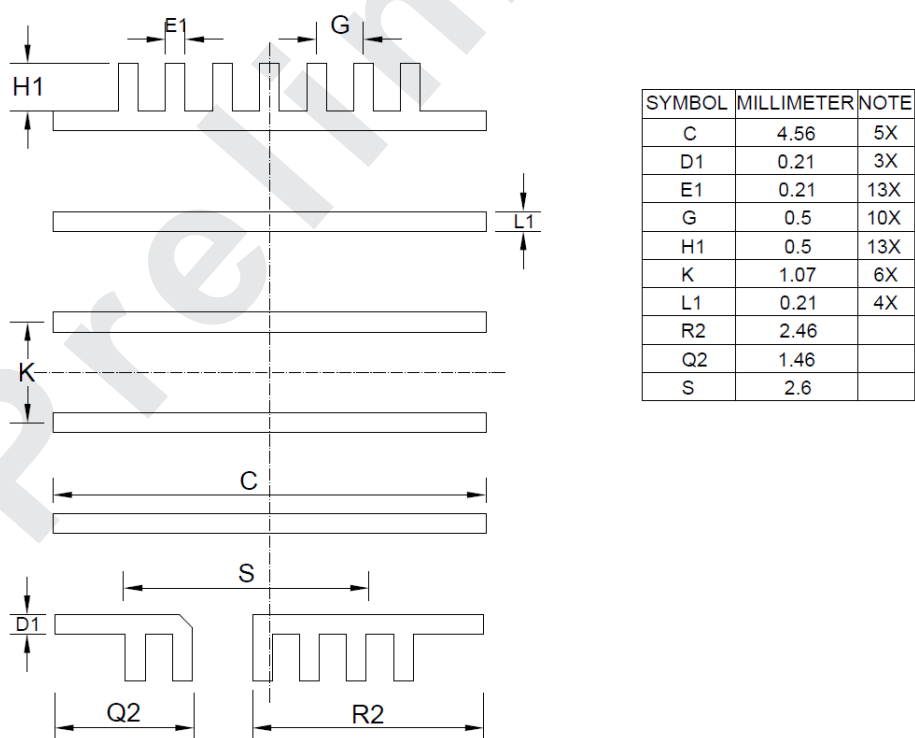
($T_J = 25^\circ\text{C}$, unless otherwise noted)

Symbol	Parameter	Conditions	Min	Typ	Max	Units
Static Characteristics						
B_{VDSS}	Drain-to-Source Voltage	$V_{GS} = 0V, I_D = 500\mu\text{A}$	150	-	-	V
I_{DSS}	Drain Source Leakage	$V_{GS} = 0V, V_{DS} = 150V$	-	2	150	μA
I_{GSS}	Gate-to-Source Forward Leakage	$V_{GS} = 5V$	-	2	100	μA
	Gate-to-Source Forward Leakage	$V_{GS} = 6V$	-	6	100	μA
	Gate-to-Source Reverse Leakage	$V_{GS} = -4V$	-	0.1	100	μA
$V_{GS(TH)}$	Gate Threshold Voltage	$V_{DS} = V_{GS}, I_D = 12\text{mA}$	0.8	1.1	100	V
$R_{DS(ON)}$	Drain-Source On-state Resistance	$V_{GS} = 5V, I_D = 30A$	-	3.2	3.9	$\text{m}\Omega$
V_{SD}	Source-Drain Forward Voltage	$I_S = 0.5A, V_{GS} = 0V$	-	1.5	-	V
Dynamic Characteristics						
C_{ISS}	Input Capacitance	$V_{GS} = 0V, V_{DS} = 75V$	-	2200	-	pF
C_{OSS}	Output Capacitance	$V_{GS} = 0V, V_{DS} = 75V$	-	900	-	
C_{RSS}	Reverse Transfer Capacitance	$V_{GS} = 0V, V_{DS} = 75V$	-	10.5	-	
$C_{OSS(ER)}$	Energy Related COSS	$V_{GS} = 0V, V_{DS} = 0V \text{ to } 75V$	-	1300	-	
$C_{OSS(TR)}$	Time Related COSS	$V_{GS} = 0V, V_{DS} = 0V \text{ to } 75V$	-	1700	-	
R_G	Gate Resistance	$f = 5 \text{ MHz, open drain}$	-	2	-	Ω
Q_G	Total Gate Charge	$V_{GS} = 5V, V_{DS} = 75V, I_D = 30A$	-	20	-	nC
Q_{GS}	Gate to Source Charge	$V_{DS} = 75V, I_D = 30A$	-	5	-	
Q_{GD}	Gate to Drain Charge	$V_{DS} = 75V, I_D = 30A$	-	3.5	-	
$Q_{G(TH)}$	Gate Charge at Threshold	$V_{DS} = 75V, I_D = 30A$	-	3	-	
Q_{OSS}	Output Charge	$V_{GS} = 0V, V_{DS} = 75V$	-	130	-	

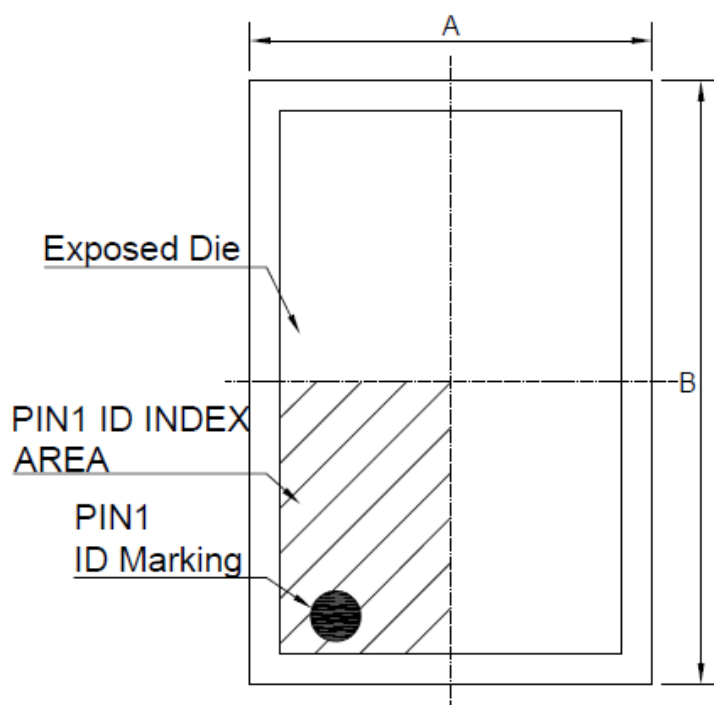
Recommended Land Pattern



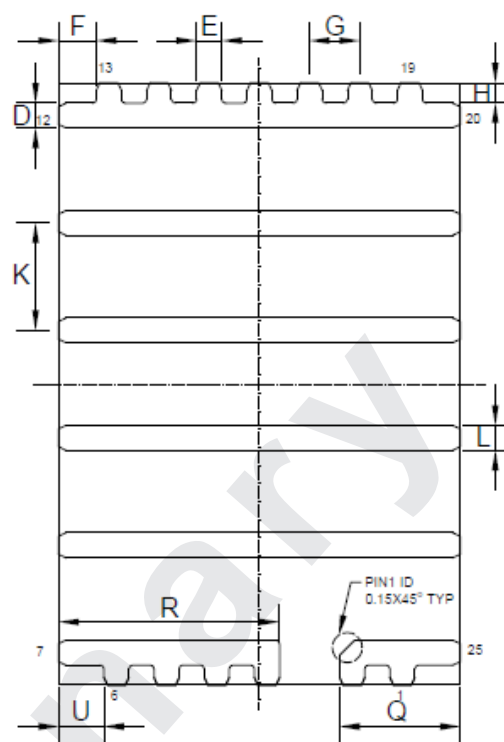
Recommended Stencil Drawing



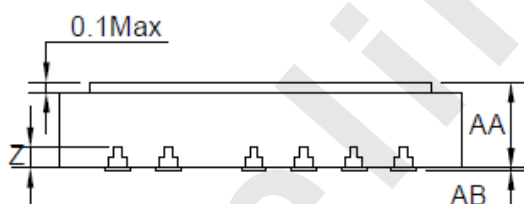
Package Dimensions, QFN4x6-25L



TOP VIEW



BOTTOM VIEW

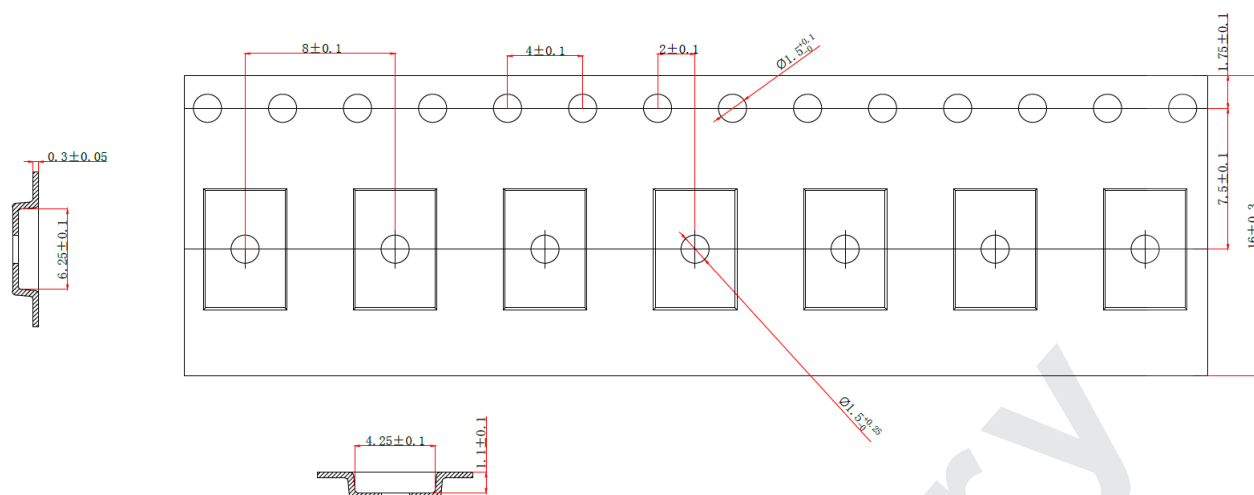


NOTE:

- 1) ALL DIMENSIONS ARE IN MILLIMETERS.
- 2) LEAD COPLANARITY SHALL BE 0.08 MILLIMETERS MAX.
- 3) JEDEC REFERENCE IS MO-220.
- 4) DRAWING IS NOT TO SCALE.

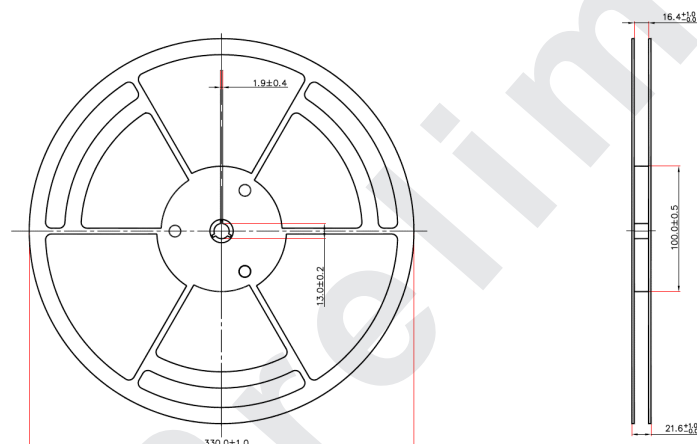
SYMBOL	MILLIMETER			NOTE
	MIN	NOM	MAX	
A	3.9	4.0	4.1	
B	5.9	6.0	6.1	
D	0.20	0.25	0.30	3X
E	0.20	0.25	0.30	13X
F	0.375 REF			2X
G	0.5 BASIC			10X
H	0.2 REF			3X
K	1.07 BASIC			6X
L	0.20	0.25	0.30	4X
Q	1.1	1.2	1.3	
R	2.1	2.2	2.3	
U	0.45 REF			2X
Z	0.203 REF			
AA	0.75	0.85	0.95	
AB	0.00	0.02	0.05	

Tape and Reel Dimensions, QFN4x6-25L



NOTES:

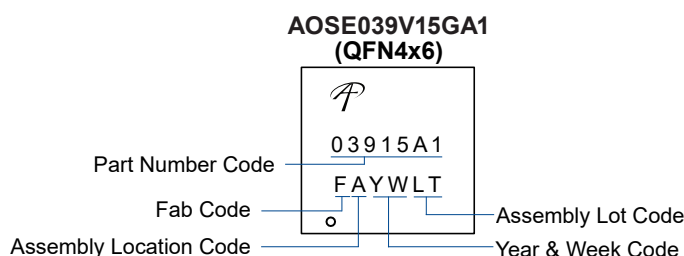
1. CARRIER TAPE COLOR: BLACK.
2. COVER TAPE WIDTH: 13.3 ± 0.10 .
3. COVER TAPE COLOR: TRANSPARENT.
4. 10 SPROCKET HOLE PITCH CUMULATIVE TOLERANCE ± 0.20 MAX.
5. CAMBER NOT TO EXCEED 1MM IN 100MM.
6. MOLD# QFN/DFN/MIS6X4X0.75/0.85.
7. ALL DIMS IN MM.
8. BAN TO USE THE ENVIRONMENT-RELATED SUBSANCES OF JCET PRESCRIBING.



NOTES:

1. 2500 UNITS PER TRAY.
2. COLOR: WHITE.
3. ALL DIM IN mm.
4. GENERAL TOLERANCE ± 0.25 .
5. BAN TO USE THE ENVIRONMENT-RELATED SUBSANCES OF JCET PRESCRIBING.
6. THE DERECTION OF VIEW:

Part Marking



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2. A critical component in any component of a life support, device, or system whose failure to perform can be reasonably expected to cause the failure of the life support device or system, or to affect its safety or effectiveness.