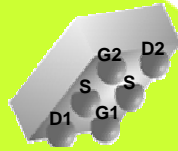


P-Channel – Dual Common Source CICLON NexFET™ Power MOSFETs CSD75301W1015

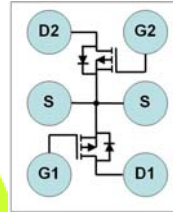


Features

- Dual P-ch MOSFETs
- Common Source Configuration
- Small Footprint – 1.0 x 1.5 mm
- Low Profile – 0.65mm
- Ultra Low Qg and Qgd
- Pb Free
- RoHS Compliant
- Halogen Free



CSP 1.0 x 1.5 mm Wafer
Level Package



Top View

Product Summary (Per Device)

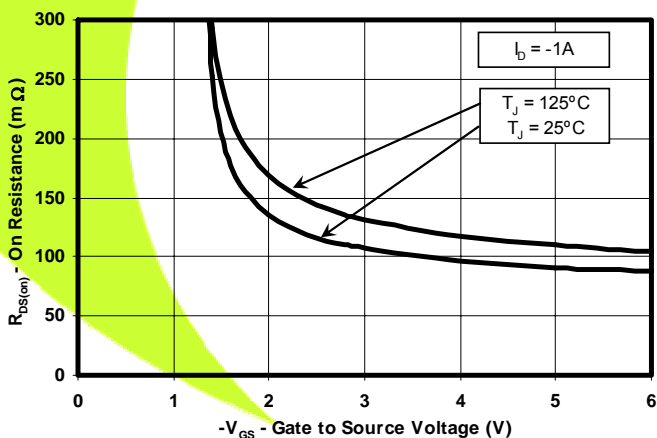
V_{DS}	-20	V
Q_g	1.5	nC
Q_{gd}	0.3	nC
$R_{DS(on)}$	$V_{GS} = -1.8V$	150 mΩ
	$V_{GS} = -2.5V$	105 mΩ
	$V_{GS} = -4.5V$	80 mΩ
V_{th}	-0.7	V

Maximum Values (Per Device at $T_A=25^\circ C$ unless otherwise stated)

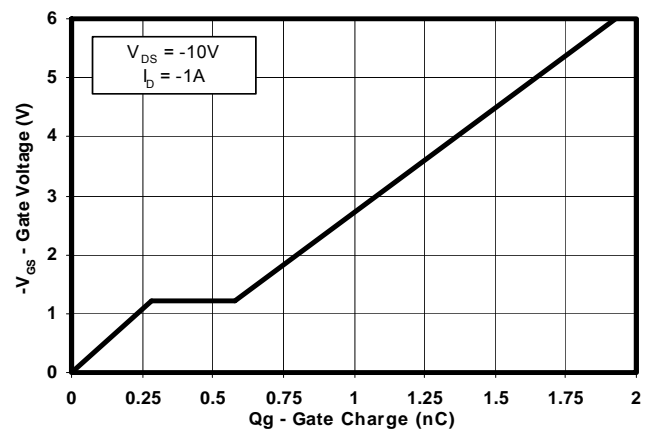
Symbol	Parameter	Value	Units
V_{DS}	Drain to Source Voltage	-20	V
V_{GS}	Gate to Source Voltage	± 8	V
I_D	Continuous Drain Current, $T_A = 25^\circ C^{1,2}$	-1.2	A
I_{DM}	Pulsed Drain Current, $T_A = 25^\circ C^{1,2,3}$	-17.5	A
P_D	Power Dissipation ^{1,2}	0.8	W
T_J, T_{STG}	Operating Junction and Storage Temperature Range	-55 to 150	$^\circ C$

1. Per device, both devices in conduction.
2. $R_{thJA} = 74^\circ C/W$ on max Cu (2 oz.) on 0.060" thick FR4 PCB.
3. Pulse width $\leq 300 \mu s$, duty cycle $\leq 2\%$

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



Gate Charge



Ordering Information

Type	Package	Package Media	Qty	Ship
CSD75301W1015	1.0 X 1.5 Wafer Level Package	7 inch reel	3000	Tape and Reel

P-Channel – Dual Common Source
CICLON NexFET™ Power MOSFETs
CSD75301W1015



Electrical Characteristics (Per Device, $T_A = 25^\circ\text{C}$ unless otherwise stated)

Symbol	Parameter	Test Conditions	Min	Typ	Max	Units
Static Characteristics						
BV_{DSS}	Drain to Source Voltage	$V_{GS} = 0V, I_D = -250\mu A$	-20	—	—	V
I_{DSS}	Drain to Source Leakage Current	$V_{GS} = 0V, V_{DS} = -16V$	—	—	-1	μA
I_{GSS}	Gate to Source Leakage Current	$V_{DS} = 0V, V_{GS} = -8V$	—	—	-100	nA
$V_{GS(th)}$	Gate to Source Threshold Voltage	$V_{DS} = V_{GS}, I_D = -250\mu A$	-0.4	-0.7	-1.0	V
$R_{DS(on)}$	Drain to Source On Resistance	$V_{GS} = -1.8V, I_D = -1A$	—	150	190	$m\Omega$
		$V_{GS} = -2.5V, I_D = -1A$	—	105	135	$m\Omega$
		$V_{GS} = -4.5V, I_D = -1A$	—	80	100	$m\Omega$
g_{fs}	Transconductance	$V_{DS} = -10V, I_D = -1A$	—	5.2	—	S
Dynamic Characteristics						
C_{ISS}	Input Capacitance	$V_{GS} = 0V, V_{DS} = -10V$ $f = 1MHz$	—	150	195	pF
C_{OSS}	Output Capacitance		—	67	87	pF
C_{RSS}	Reverse Transfer Capacitance		—	24	31	pF
R_g	Series Gate Resistance		—	1.1	—	Ω
Q_g	Gate Charge Total (-4.5V)	$V_{DS} = -10V, I_D = -1A$	—	1.5	2.1	nC
Q_{gd}	Gate Charge Gate to Drain		—	0.30	—	nC
Q_{gs}	Gate Charge Gate to Source		—	0.28	—	nC
$Q_{g(th)}$	Gate Charge at V_{th}		—	0.12	—	nC
Q_{OSS}	Output Charge	$V_{DS} = -9.5V, V_{GS} = 0V$	—	1.1	—	nC
$t_{d(on)}$	Turn On Delay Time	$V_{DS} = -10V$ $V_{GS} = -4.5V, I_D = -1A$ $R_G = 30\Omega$	—	3.0	—	ns
t_r	Rise Time		—	1.7	—	ns
$t_{d(off)}$	Turn Off Delay Time		—	38	—	ns
t_f	Fall Time		—	16	—	ns
Diode Characteristics						
V_{SD}	Diode Forward Voltage	$I_S = -1A, V_{GS} = 0V$	—	-0.81	-1.0	V
Q_{rr}	Reverse Recovery Charge	$V_{dd} = -9.5V, I_F = -1A,$ $di/dt = 200A/\mu s$	—	2.0	—	nC
t_{rr}	Reverse Recovery Time	$V_{dd} = -9.5V, I_F = -1A,$ $di/dt = 200A/\mu s$	—	7.5	—	ns

P-Channel – Dual Common Source CICLON NexFET™ Power MOSFETs CSD75301W1015

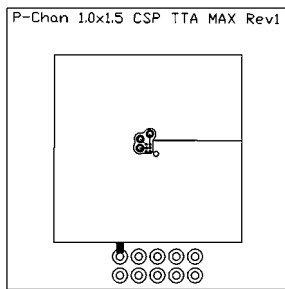


Thermal Characteristics (T_A = 25°C unless otherwise stated)

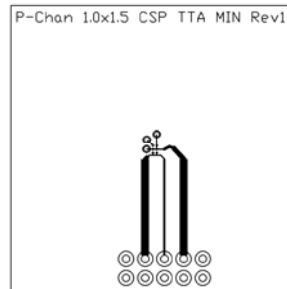
Symbol	Parameter	Min	Typ	Max	Units
Thermal Characteristics					
R _{θJA}	Thermal Resistance Junction to Ambient ^{4,6}	—	—	136	°C/W
R _{θJA}	Thermal Resistance Junction to Ambient ^{5,6}	—	—	93	°C/W

Notes:

- Device mounted on FR4 material with Minimum Cu mounting area.
- Device mounted on FR4 Material with 1in² of 2 oz. Cu.
- Measured with both devices biased in a parallel condition.



Max R_{θJA} = 93 °C/W when
mounted on 1in² of
2 oz. Cu.



Max R_{θJA} = 136 °C/W when
mounted on min pad area of
2 oz. Cu.

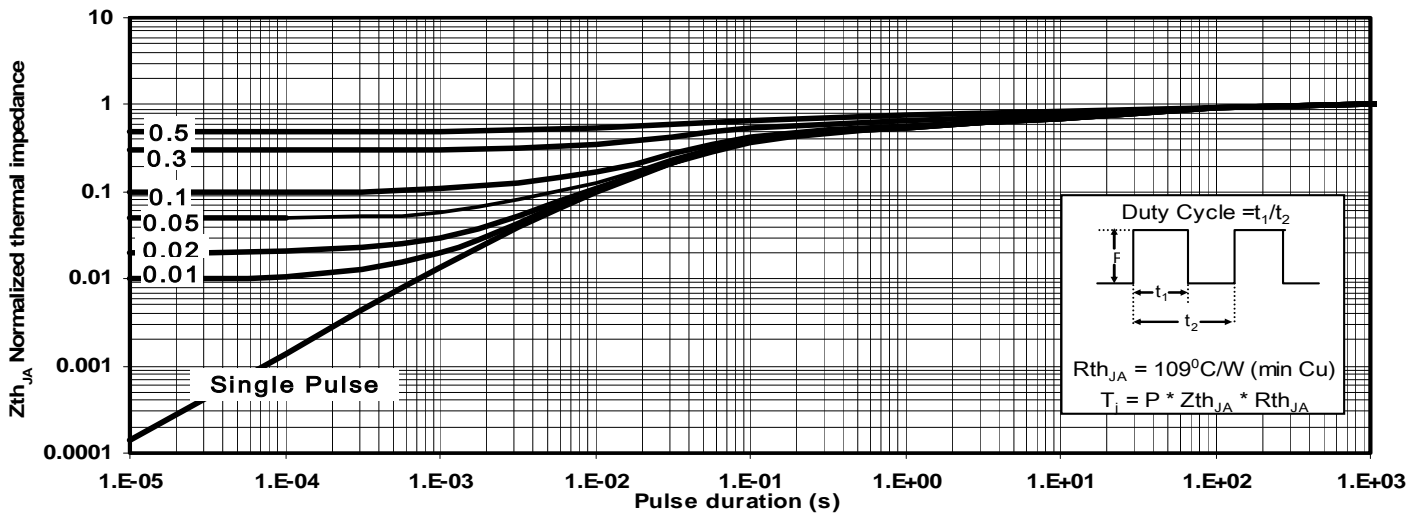


Figure 1: Transient Thermal Impedance

P-Channel – Dual Common Source CICLON NexFET™ Power MOSFETs CSD75301W1015



Typical MOSFET Characteristics ($T_A = 25^\circ\text{C}$ unless otherwise stated)

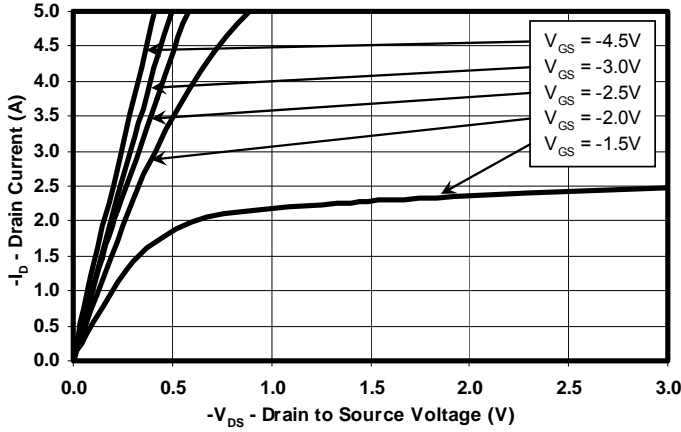


Figure 2: Saturation Characteristics

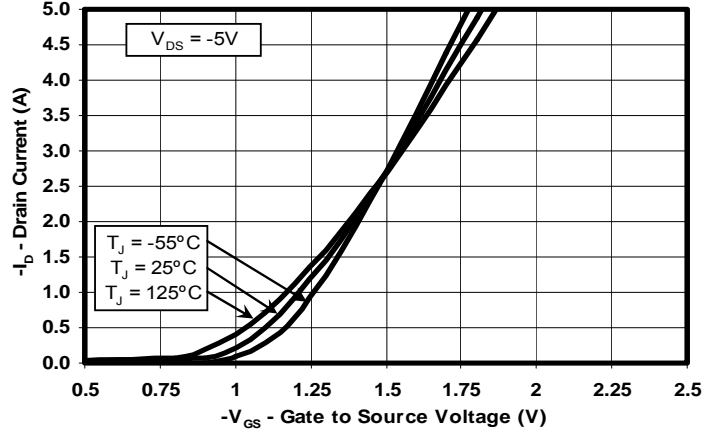


Figure 3: Transfer Characteristics

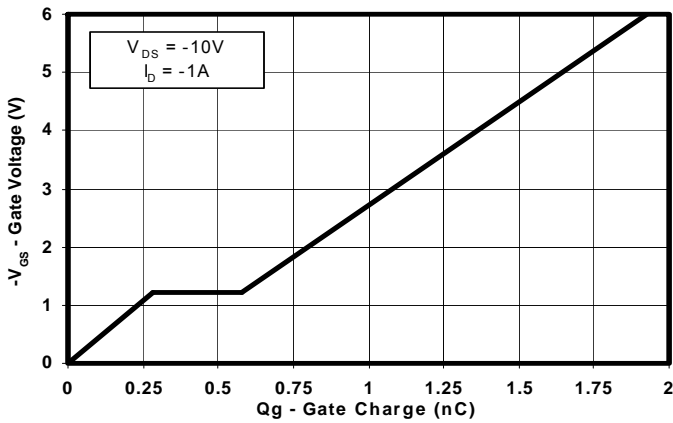


Figure 4: Gate Charge

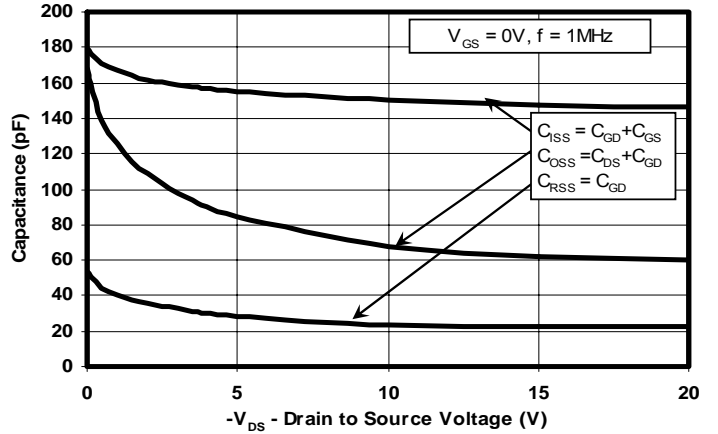


Figure 5: Capacitance

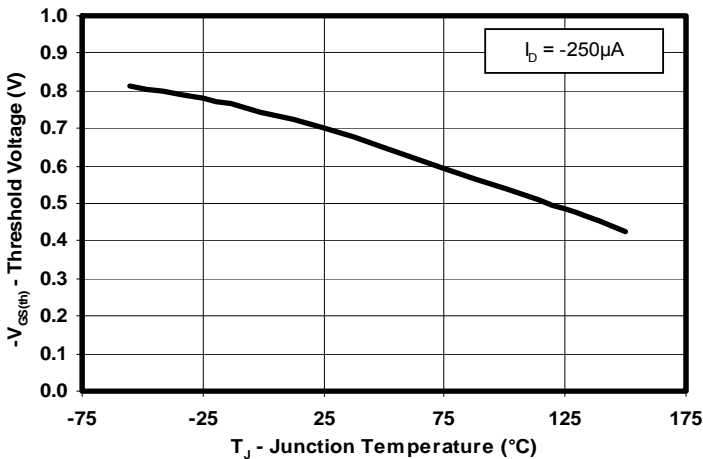


Figure 6: Threshold Voltage vs. Temperature

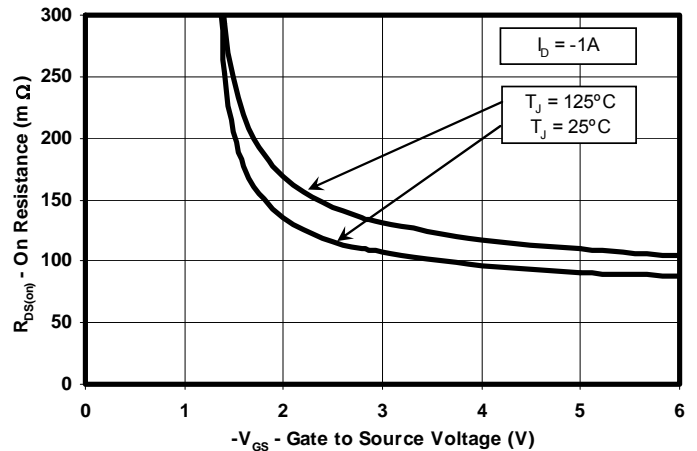


Figure 7: On Resistance vs. Gate Voltage

P-Channel – Dual Common Source CICLON NexFET™ Power MOSFETs CSD75301W1015



Typical MOSFET Characteristics ($T_A = 25^\circ\text{C}$ unless otherwise stated)

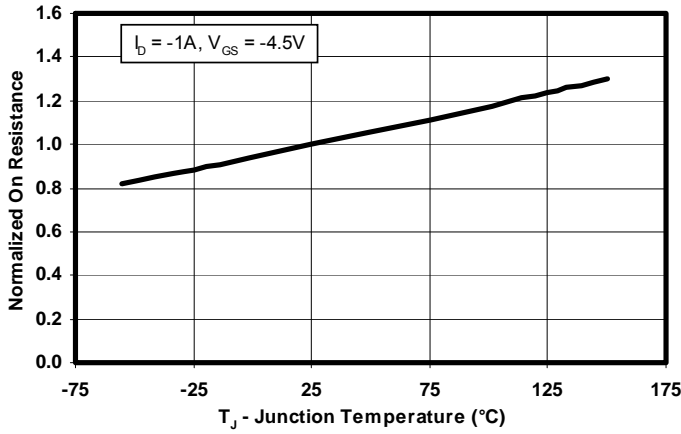


Figure 8: On Resistance vs. Temperature

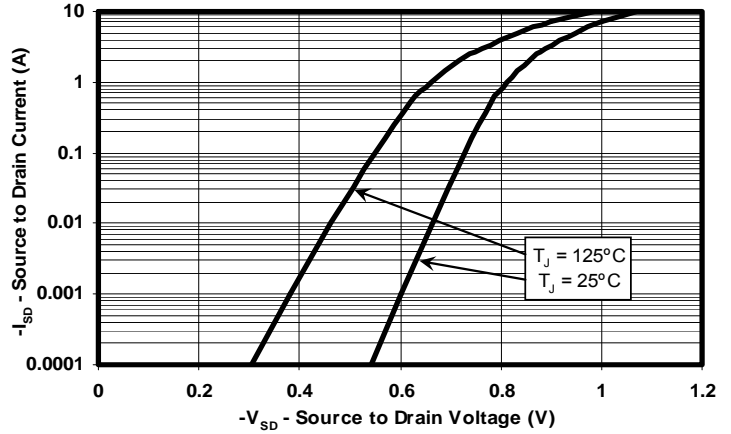


Figure 9: Typical Diode Forward Voltage

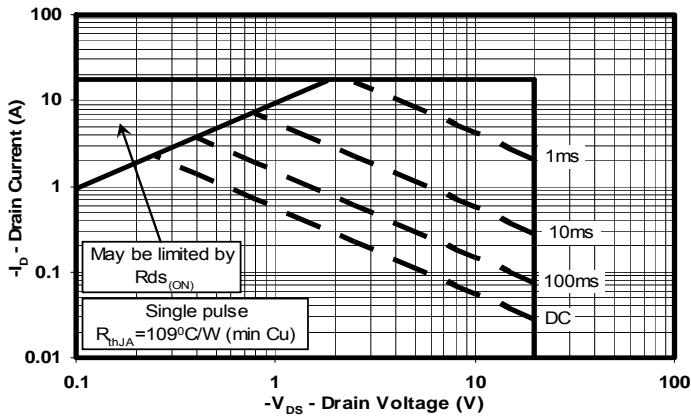


Figure 10: Maximum Safe Operating Area

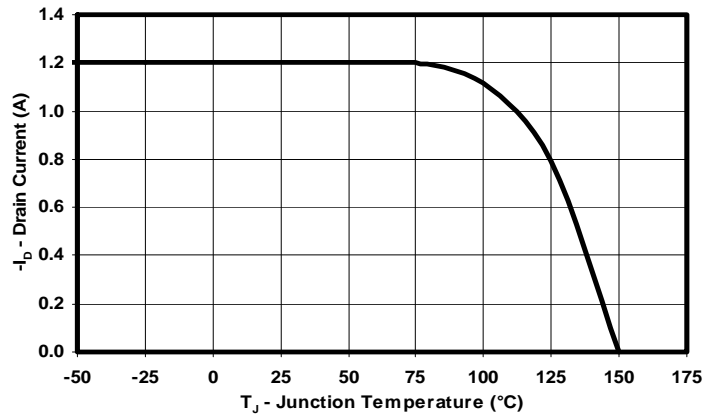
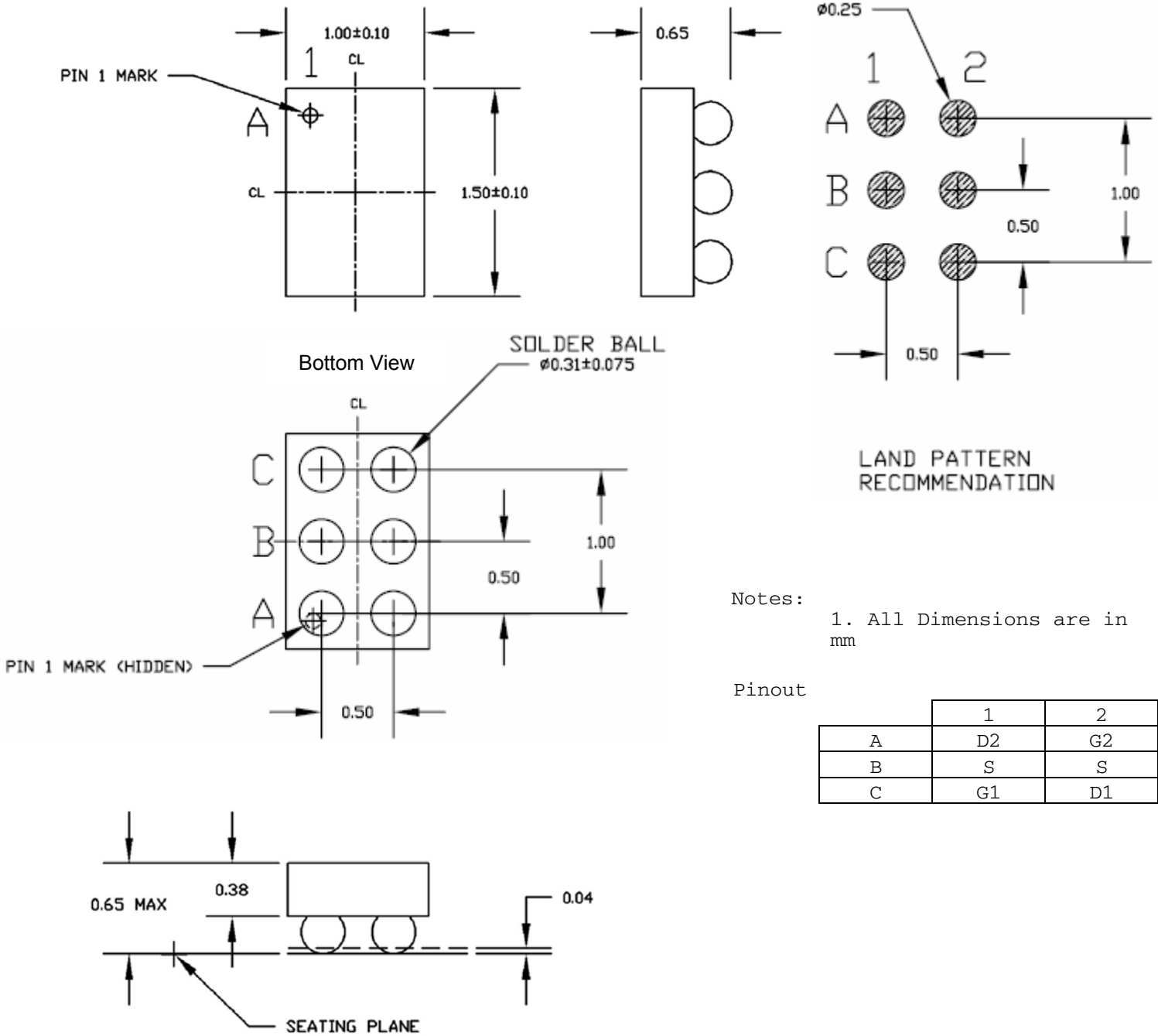


Figure 11: Maximum Drain Current vs. Temperature

P-Channel – Dual Common Source
CICLON NexFET™ Power MOSFETs
CSD75301W1015



CSD75301W1015 Package Dimensions



Notes:

1. All Dimensions are in mm

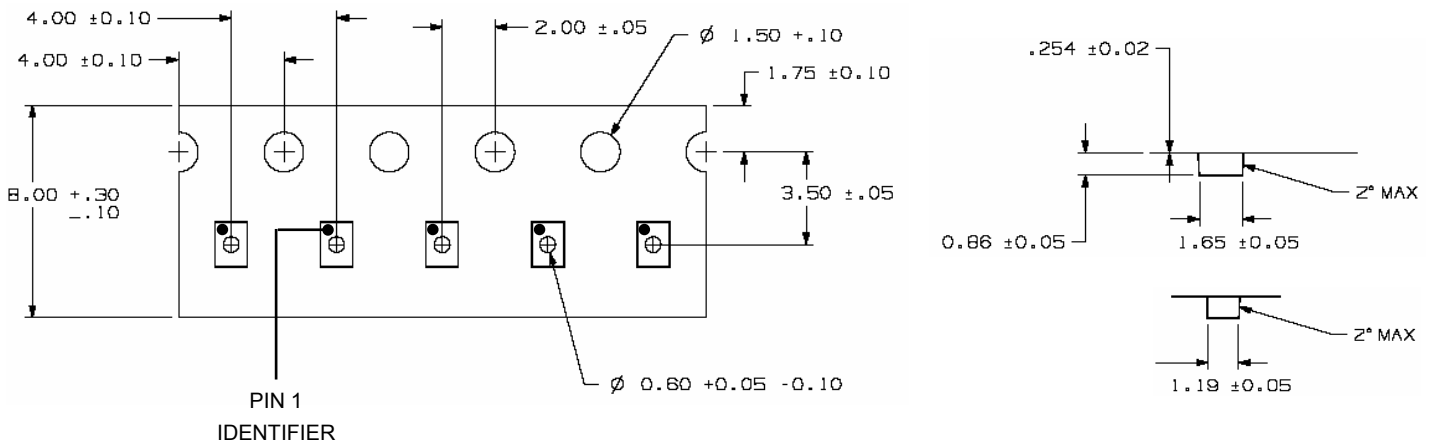
Pinout

	1	2
A	D2	G2
B	S	S
C	G1	D1

P-Channel – Dual Common Source
CICLON NexFET™ Power MOSFETs
CSD75301W1015



Tape and Reel Information



Package Marking Information

Location:

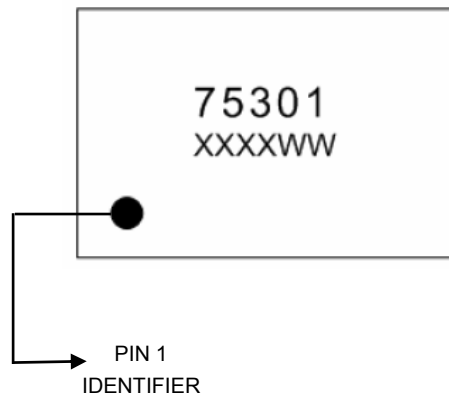
1st Line

Product Code = 75301 (Fixed Text)

2nd Line

XXXXWW = Last 4 digits of lot number

(XXXX); Wafer number (WW)



P-Channel – Dual Common Source
CICLON NexFET™ Power MOSFETs
CSD75301W1015



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PACKAGING INFORMATION

Orderable Device	Status ⁽¹⁾	Package Type	Package Drawing	Pins	Package Qty	Eco Plan ⁽²⁾	Lead/Ball Finish	MSL Peak Temp ⁽³⁾
CSD75301W1015	ACTIVE	DSBGA	YZC	6	3000	Green (RoHS & no Sb/Br)	SNAGCU	Level-1-260C-UNLIM

⁽¹⁾ The marketing status values are defined as follows:

ACTIVE: Product device recommended for new designs.

LIFEBUY: TI has announced that the device will be discontinued, and a lifetime-buy period is in effect.

NRND: Not recommended for new designs. Device is in production to support existing customers, but TI does not recommend using this part in a new design.

PREVIEW: Device has been announced but is not in production. Samples may or may not be available.

OBSOLETE: TI has discontinued the production of the device.

⁽²⁾ Eco Plan - The planned eco-friendly classification: Pb-Free (RoHS), Pb-Free (RoHS Exempt), or Green (RoHS & no Sb/Br) - please check <http://www.ti.com/productcontent> for the latest availability information and additional product content details.

TBD: The Pb-Free/Green conversion plan has not been defined.

Pb-Free (RoHS): TI's terms "Lead-Free" or "Pb-Free" mean semiconductor products that are compatible with the current RoHS requirements for all 6 substances, including the requirement that lead not exceed 0.1% by weight in homogeneous materials. Where designed to be soldered at high temperatures, TI Pb-Free products are suitable for use in specified lead-free processes.

Pb-Free (RoHS Exempt): This component has a RoHS exemption for either 1) lead-based flip-chip solder bumps used between the die and package, or 2) lead-based die adhesive used between the die and leadframe. The component is otherwise considered Pb-Free (RoHS compatible) as defined above.

Green (RoHS & no Sb/Br): TI defines "Green" to mean Pb-Free (RoHS compatible), and free of Bromine (Br) and Antimony (Sb) based flame retardants (Br or Sb do not exceed 0.1% by weight in homogeneous material)

⁽³⁾ MSL, Peak Temp. -- The Moisture Sensitivity Level rating according to the JEDEC industry standard classifications, and peak solder temperature.

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