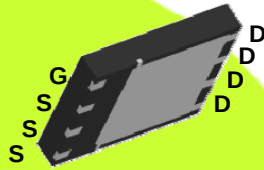


N-Channel CICLON NexFET™ Power MOSFETs CSD16414Q5

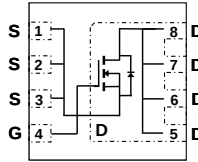


Features

- Ultra Low Qg & Qgd
- Low Thermal Resistance
- Avalanche Rated
- Pb Free Terminal Plating
- RoHS Compliant
- Halogen Free



QFN 5mm x 6mm Plastic Package



Top View

Product Summary

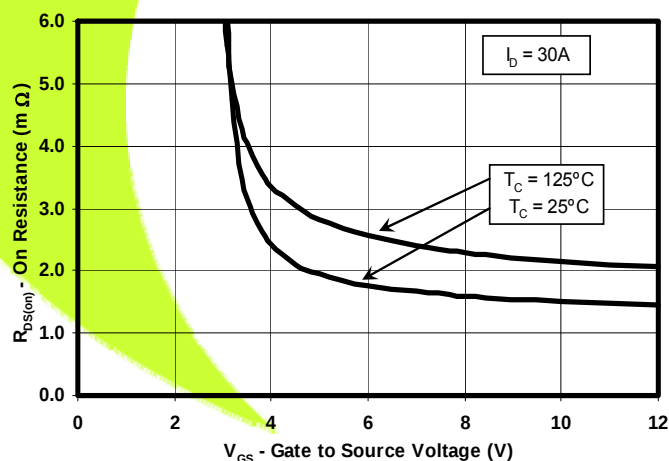
V_{DS}	25	V
Q_g	16.6	nC
Q_{gd}	4.4	nC
$R_{DS(on)}$	$V_{GS}=4.5V$	2.1 m Ω
	$V_{GS}=10V$	1.5 m Ω
V_{th}	1.6	V

Maximum Values ($T_A=25^\circ\text{C}$ unless otherwise stated)

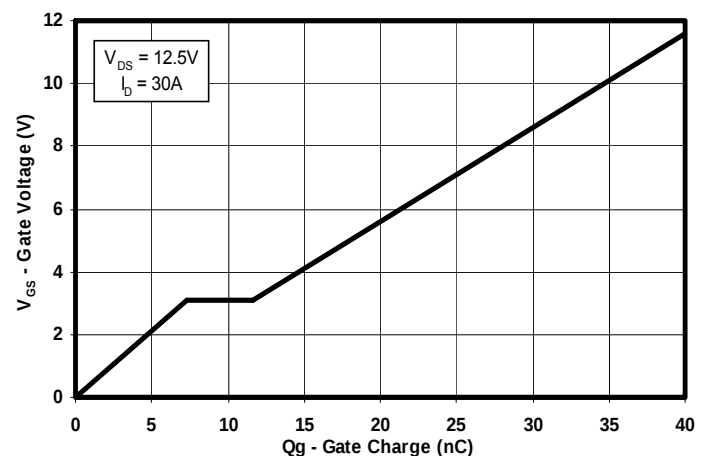
Symbol	Parameter	Value	Units
V_{DS}	Drain to Source Voltage	25	V
V_{GS}	Gate to Source Voltage	+16 / -12	V
I_D	Continuous Drain Current, $T_C = 25^\circ\text{C}$	100	A
	Continuous Drain Current ¹	34	A
I_{DM}	Pulsed Drain Current, $T_A = 25^\circ\text{C}$ ²	213	A
P_D	Power Dissipation ¹	3.2	W
T_J, T_{STG}	Operating Junction and Storage Temperature Range	-55 to 150	$^\circ\text{C}$
E_{AS}	Avalanche Energy, single pulse $I_D=100A$, $L = 0.1mH$, $R_G = 25\Omega$	500	mJ

1. $R_{\theta JA} = 39^\circ\text{C/W}$ on 1in² Cu (2 oz.) on 0.060" thick FR4 PCB.
2. See Figure 10

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



Gate Charge



Ordering Information

Type	Package	Package Media	Qty	Ship
CSD16414Q5	QFN 5X6 Plastic Package	13 inch reel	2500	Tape and Reel

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

Symbol	Parameter	Test Conditions	Min	Typ	Max	Units
Static Characteristics						
BV _{DSS}	Drain to Source Voltage	V _{GS} = 0V, I _D = 250μA	25	—	—	V
I _{DSS}	Drain to Source Leakage Current	V _{GS} = 0V, V _{DS} = 20V	—	—	1	μA
I _{GSS}	Gate to Source Leakage Current	V _{DS} = 0V, V _{GS} = +16/-12V	—	—	100	nA
V _{GS(th)}	Gate to Source Threshold Voltage	V _{DS} = V _{GS} , I _D = 250μA	1.3	1.6	2.0	V
R _{DS(on)}	Drain to Source On Resistance	V _{GS} = 4.5V, I _D = 30A	—	2.1	2.6	mΩ
		V _{GS} = 10V, I _D = 30A	—	1.5	1.9	mΩ
g _{fs}	Transconductance	V _{DS} = 15V, I _D = 30A	—	138	—	S
Dynamic Characteristics						
C _{ISS}	Input Capacitance	V _{GS} = 0V, V _{DS} = 12.5V f = 1MHz	—	2810	3650	pF
C _{OSS}	Output Capacitance		—	2040	2650	pF
C _{RSS}	Reverse Transfer Capacitance		—	140	180	pF
R _g	Series Gate Resistance		—	1.3	—	Ω
Q _g	Gate Charge Total (4.5V)	V _{DS} = 12.5V, I _D = 30A	—	16.6	21	nC
Q _{gd}	Gate Charge Gate to Drain		—	4.4	—	nC
Q _{gs}	Gate Charge Gate to Source		—	7.3	—	nC
Q _{g(th)}	Gate Charge at V _{th}		—	4.5	—	nC
Q _{OSS}	Output Charge	V _{DS} = 13.5V, V _{GS} = 0V	—	40	—	nC
t _{d(on)}	Turn On Delay Time	V _{DS} = 12.5V V _{GS} = 4.5V I _D = 30A R _G = 3.0 Ω	—	21	—	ns
t _r	Rise Time		—	35	—	ns
t _{d(off)}	Turn Off Delay Time		—	25	—	ns
t _f	Fall Time		—	20	—	ns
Diode Characteristics						
V _{SD}	Diode Forward Voltage	I _S = 30A, V _{GS} = 0V	—	0.81	1.0	V
Q _{rr}	Reverse Recovery Charge	V _{dd} =13.5V, I _F = 30A, di/dt = 300A/μs	—	44	—	nC
t _{rr}	Reverse Recovery Time	V _{dd} =13.5V, I _F = 30A, di/dt = 300A/μs	—	35	—	ns

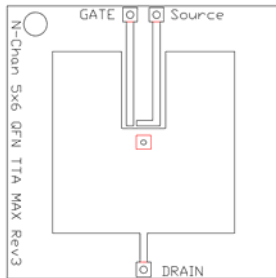
N-Channel CICLON NexFET™ Power MOSFETs CSD16414Q5



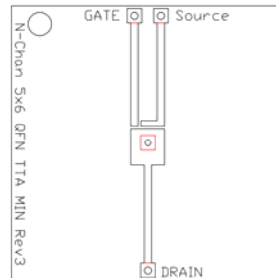
Thermal Characteristics ($T_A = 25^\circ\text{C}$ unless otherwise stated)

Symbol	Parameter	Min	Typ	Max	Units
Thermal Characteristics					
$R_{\theta JC}$	Thermal Resistance Junction to Case ³	—	—	1.1	$^\circ\text{C/W}$
$R_{\theta JA}$	Thermal Resistance Junction to Ambient ^{3,4}	—	—	50	$^\circ\text{C/W}$

- $R_{\theta JC}$ is determined with the device mounted on a 1in square 2 oz. Cu pad on a 1.5x1.5 in .060in thick FR4 board. $R_{\theta JC}$ is guaranteed by design while $R_{\theta ca}$ is determined by the user's board design.
- Device mounted on FR4 Material with 1in² of 2 oz. Cu.



Max $R_{\theta JA} = 50^\circ\text{C/W}$ when
mounted on 1in² of
2 oz. Cu.



Max $R_{\theta JA} = 122^\circ\text{C/W}$ when
mounted on min pad area of
2 oz. Cu.

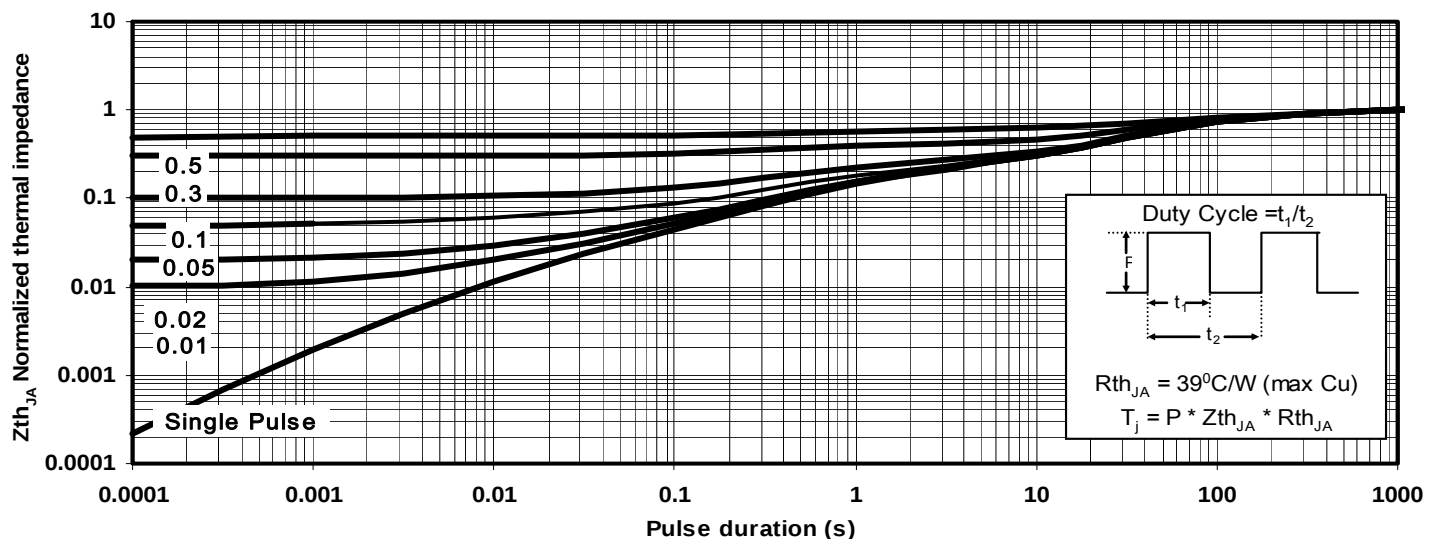


Figure 1: Transient Thermal Impedance

N-Channel CICLON NexFET™ Power MOSFETs CSD16414Q5



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

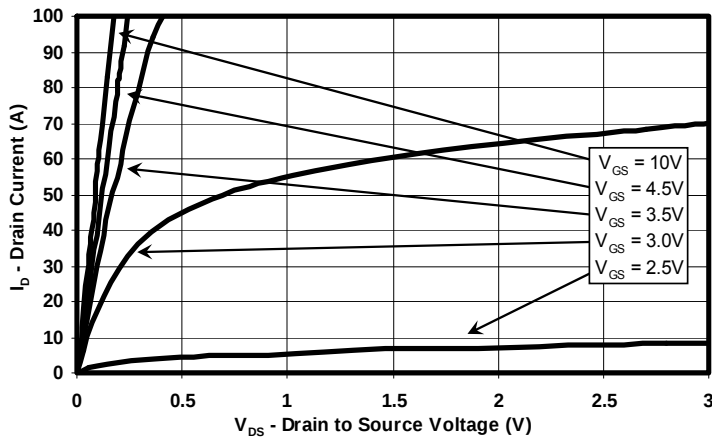


Figure 2: Saturation Characteristics

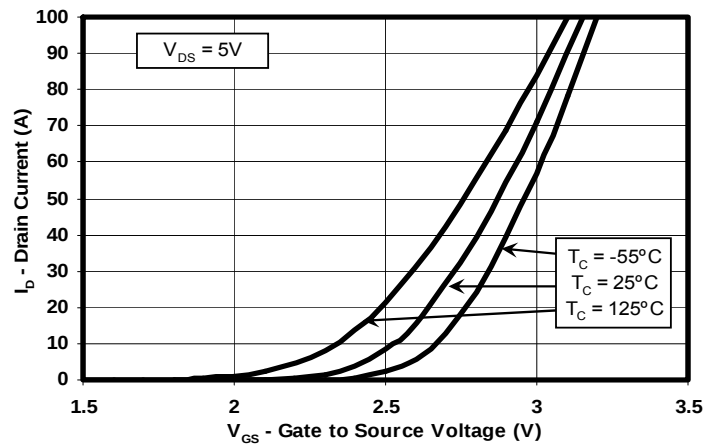


Figure 3: Transfer Characteristics

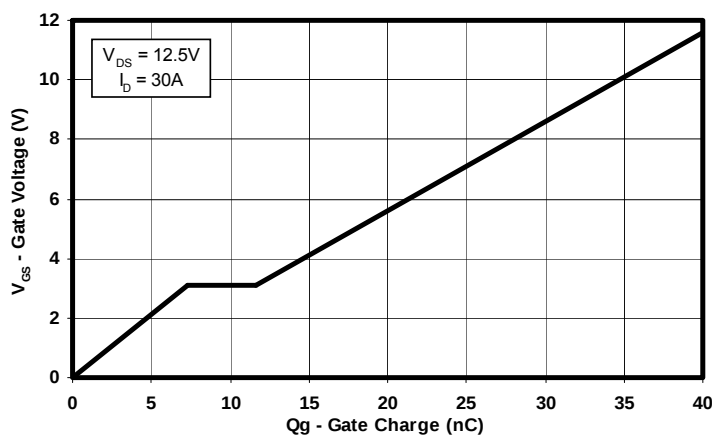


Figure 4: Gate Charge

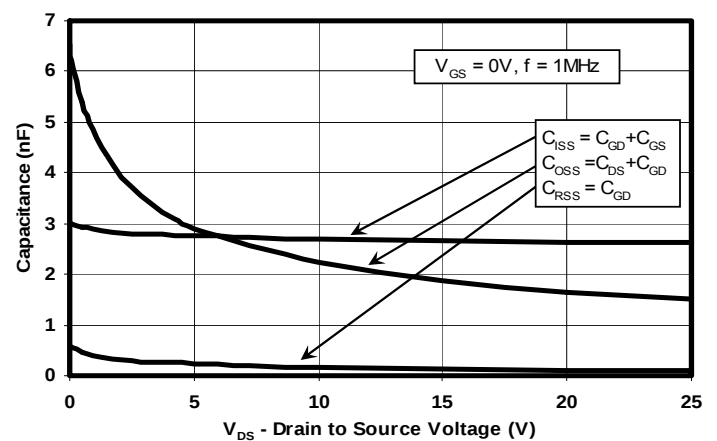


Figure 5: Capacitance

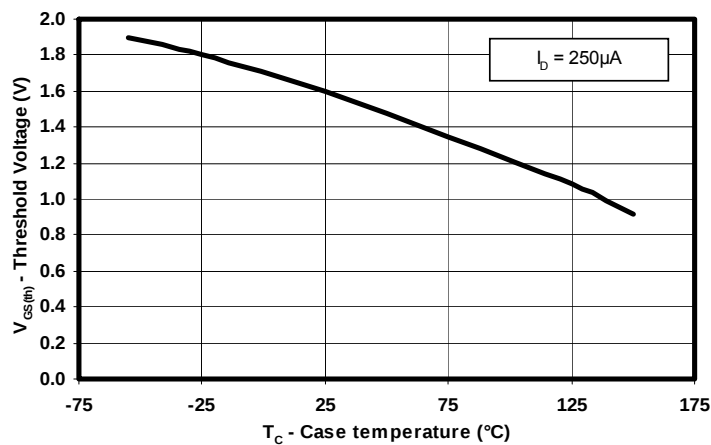


Figure 6: Threshold Voltage vs. Temperature

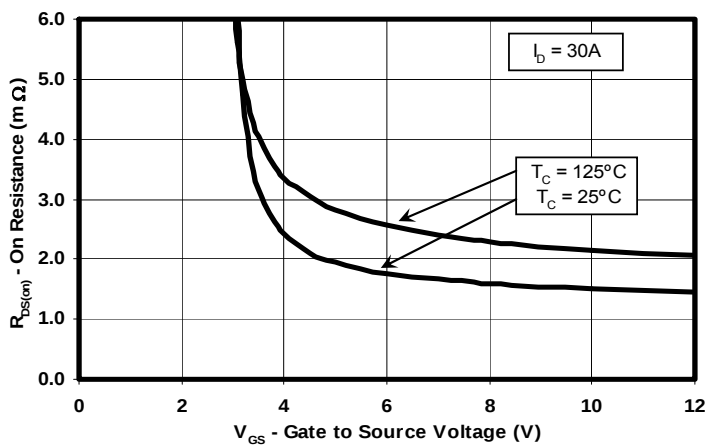


Figure 7: On Resistance vs. Gate Voltage

N-Channel CICLON NexFET™ Power MOSFETs CSD16414Q5



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

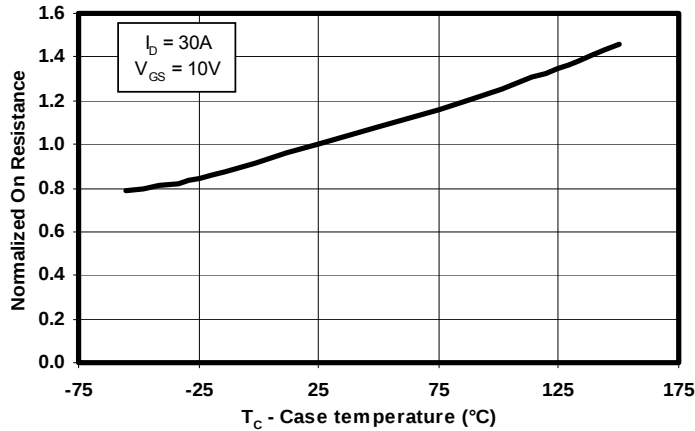


Figure 8: On Resistance vs. Temperature

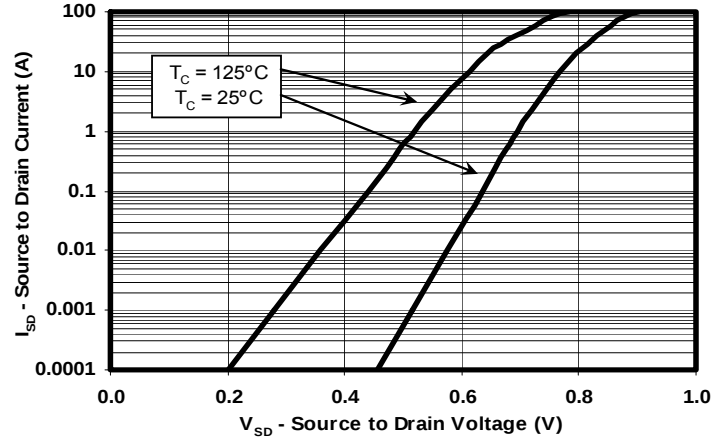


Figure 9: Typical Diode Forward Voltage

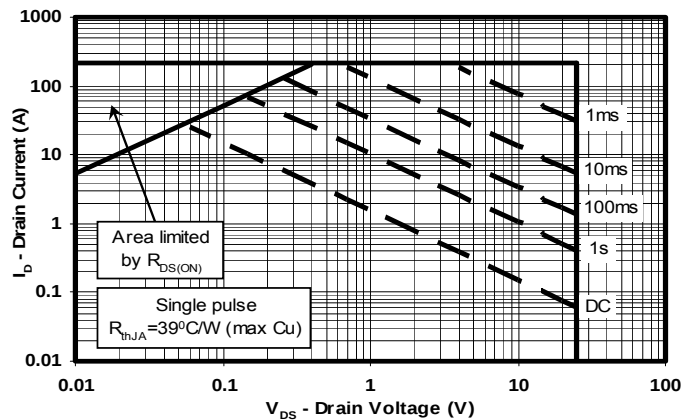


Figure 10: Maximum Safe Operating Area

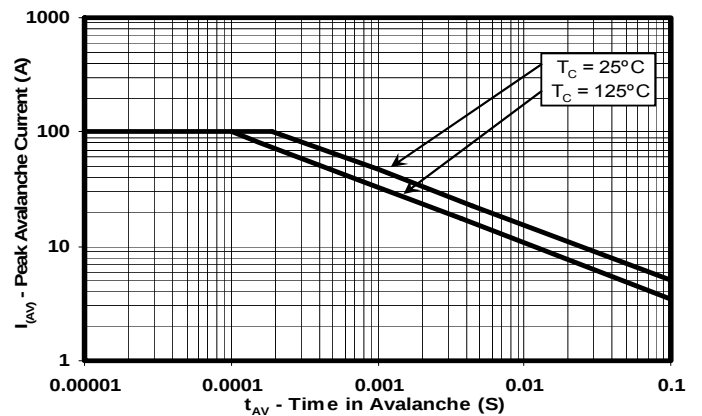


Figure 11: Single Pulse Unclamped Inductive Switching

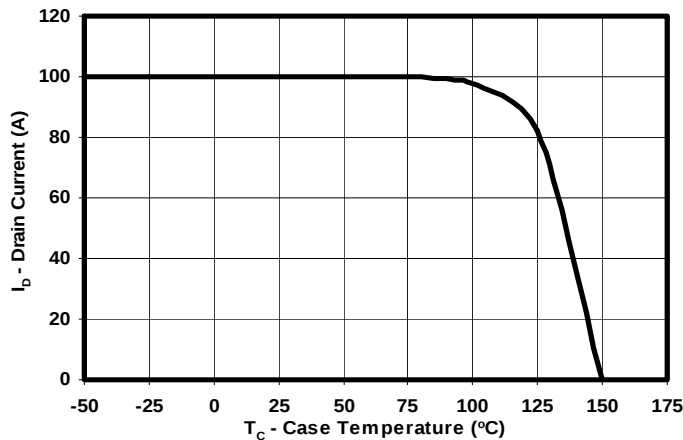


Figure 12: Maximum Drain Current vs. Temperature

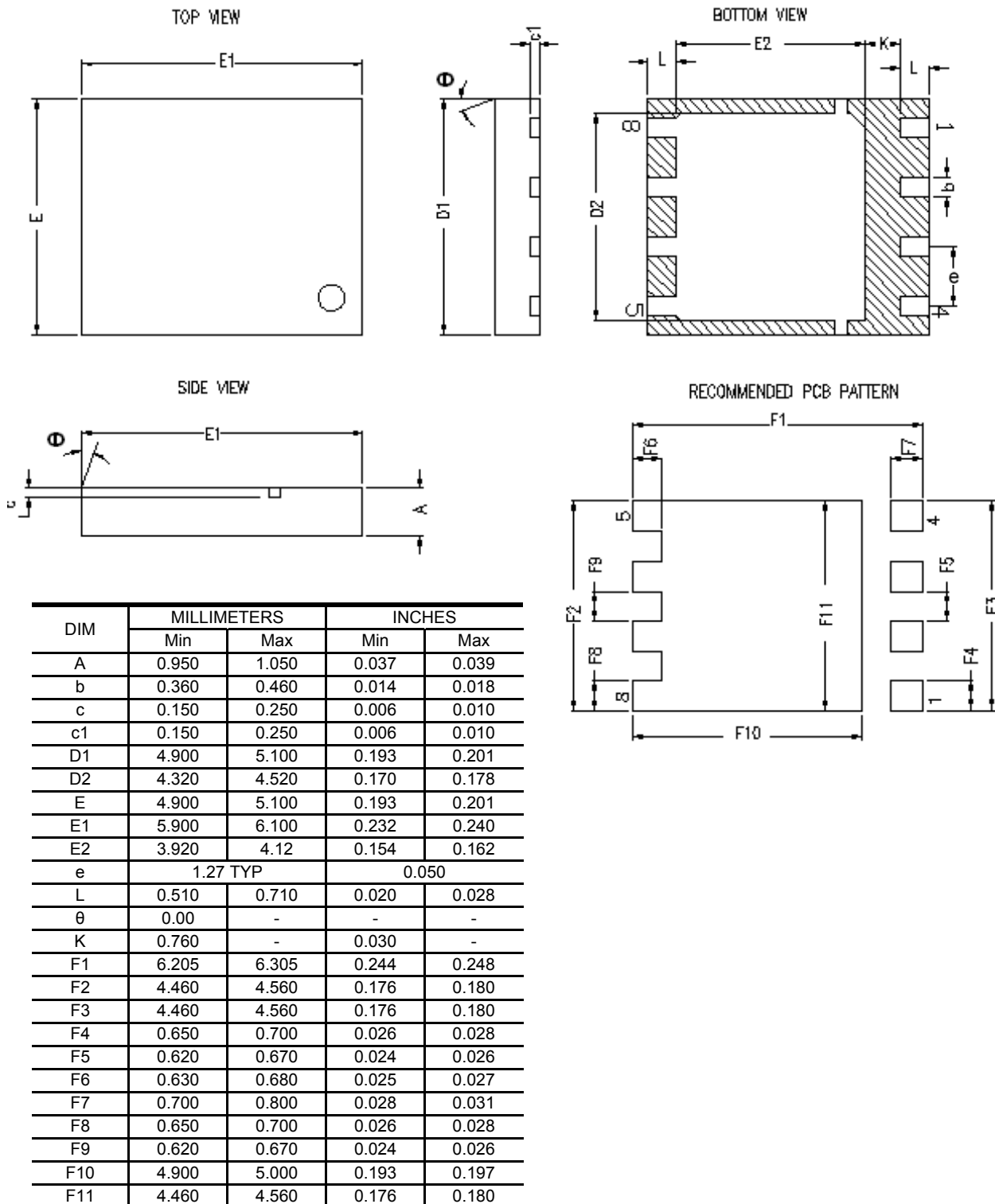
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CICLON NexFET™ Power MOSFETs

CSD16414Q5



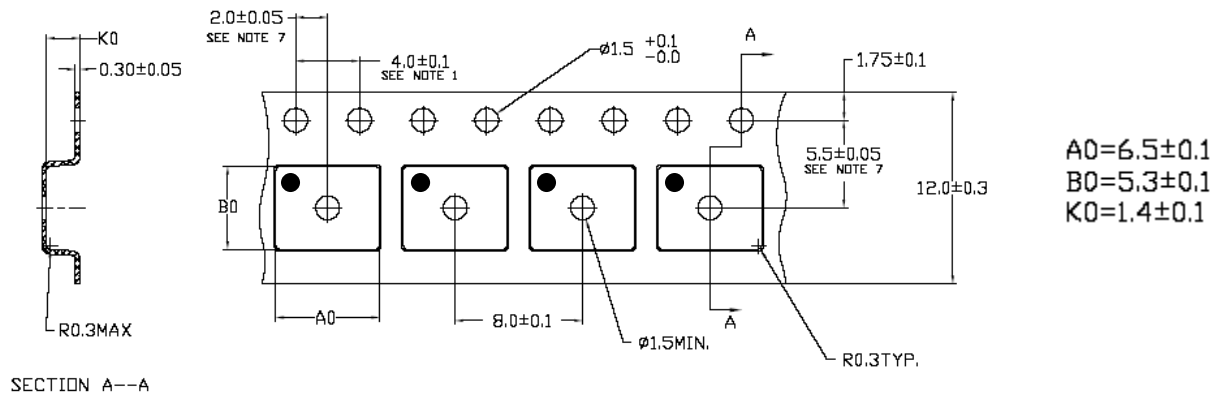
CSD16414Q5 Package Dimensions



N-Channel CICLON NexFET™ Power MOSFETs CSD16414Q5



Q5 Tape and Reel Information



Note:

1. 10 SPROCKET HOLE PITCH CUMULATIVE TOLERANCE +/-0.2
2. CAMBER NOT TO EXCEED 1mm IN 100mm, NONCUMULATIVE OVER 250mm
3. MATERIAL:BLACK STATIC DISSIPATIVE POLYSTYRENE
4. ALL DIMENSIONS ARE IN mm (UNLESS OTHERWISE SPECIFIED)
5. THICKNESS: 0.30 +/-0.05mm

Package Marking Information

Location:

1st Line

CSD = Fixed Characters

NNNNN = Product Code

2nd Line (Date Code)

YY = Last 2 digits of the Year

WW = 2-digit Work Week

C = Country of Origin

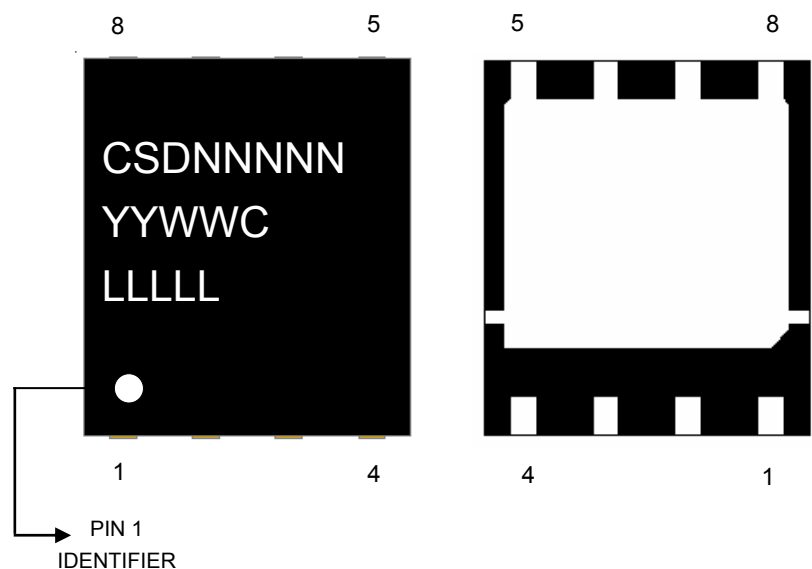
> Philippines = P

> Taiwan = T

> China = C

3rd Line

LLLLL= Last 5 digits of the Wafer Lot #



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