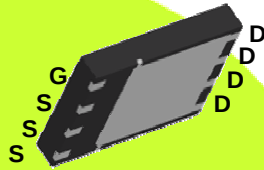


N-Channel CICLON NexFET™ Power MOSFETs CSD16407Q5

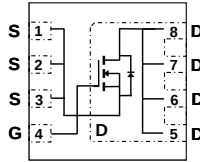


Features

- Ultra Low Q_g & Q_{gd}
- Low Thermal Resistance
- Avalanche Rated
- Pb Free Terminal Plating
- RoHS Compliant
- Halogen Free



QFN 5mm x 6mm Plastic Package



Top View

Product Summary

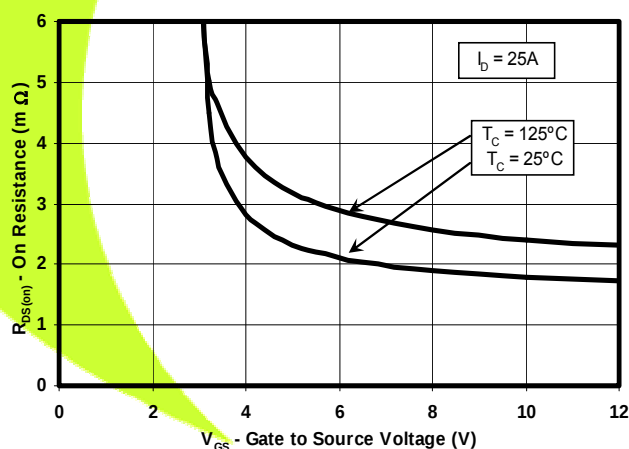
V_{DS}	25	V
Q_g	13.3	nC
Q_{gd}	3.5	nC
$R_{DS(on)}$	$V_{GS}=4.5V$	2.5 m Ω
	$V_{GS}=10V$	1.8 m Ω
V_{th}	1.6	V

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

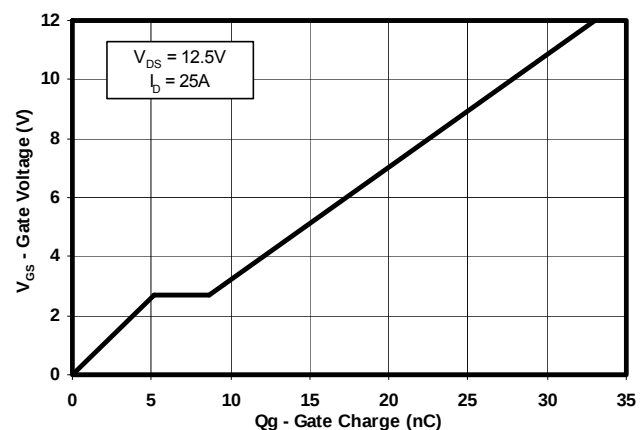
Symbol	Parameter	Value	Units
V_{DS}	Drain to Source Voltage	25	V
V_{GS}	Gate to Source Voltage	+16 / -12	V
I_D	Continuous Drain Current, $T_C = 25^\circ\text{C}$	100	A
	Continuous Drain Current ¹	31	A
I_{DM}	Pulsed Drain Current, $T_A = 25^\circ\text{C}$ ²	200	A
P_D	Power Dissipation ¹	3.1	W
T_J, T_{STG}	Operating Junction and Storage Temperature Range	-55 to 150	$^\circ\text{C}$
E_{AS}	Avalanche Energy, single pulse $I_D=66A$, $L = 0.1mH$, $R_G = 25\Omega$	218	mJ

1. $R_{\theta JA} = 40^\circ\text{C/W}$ on 1in² Cu (2 oz.) on 0.060" thick FR4 PCB.
2. Pulse width $\leq 300 \mu\text{s}$, duty cycle $\leq 2\%$

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



Gate Charge



Ordering Information

Type	Package	Package Media	Qty	Ship
CSD16407Q5	QFN 5X6 Plastic Package	13 inch reel	2500	Tape and Reel

N-Channel
CICLON NexFET™ Power MOSFETs
CSD16407Q5



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	1.9	V
R _{DS(on)}	Drain to Source On Resistance	V _{GS} = 4.5V, I _D = 25A	—	2.5	3.3	mΩ
		V _{GS} = 10V, I _D = 25A	—	1.8	2.4	mΩ
g _{fs}	Transconductance	V _{DS} = 15V, I _D = 25A	—	111	—	S
Dynamic Characteristics						
C _{ISS}	Input Capacitance	V _{GS} = 0V, V _{DS} = 12.5V f = 1MHz	—	2040	2660	pF
C _{OSS}	Output Capacitance		—	1600	2080	pF
C _{RSS}	Reverse Transfer Capacitance		—	115	160	pF
R _g	Series Gate Resistance		—	1.2	—	Ω
Q _g	Gate Charge Total (4.5V)	V _{DS} = 12.5V, I _D = 25A	—	13.3	18	nC
Q _{gd}	Gate Charge Gate to Drain		—	3.5	—	nC
Q _{gs}	Gate Charge Gate to Source		—	5.3	—	nC
Q _{g(th)}	Gate Charge at V _{th}		—	3.1	—	nC
Q _{OSS}	Output Charge	V _{DS} = 13.5V, V _{GS} = 0V	—	33	—	nC
t _{d(on)}	Turn On Delay Time	V _{DS} = 12.5V V _{GS} = 4.5V I _D = 25A R _G = 3.0 Ω	—	17	—	ns
t _r	Rise Time		—	29	—	ns
t _{d(off)}	Turn Off Delay Time		—	22	—	ns
t _f	Fall Time		—	20	—	ns
Diode Characteristics						
V _{SD}	Diode Forward Voltage	I _S = 25A, V _{GS} = 0V	—	0.8	1.0	V
Q _{rr}	Reverse Recovery Charge	V _{dd} =13.5V, I _F = 25A, di/dt = 300A/μs	—	41	—	nC
t _{rr}	Reverse Recovery Time	V _{dd} =13.5V, I _F = 25A, di/dt = 300A/μs	—	34	—	ns

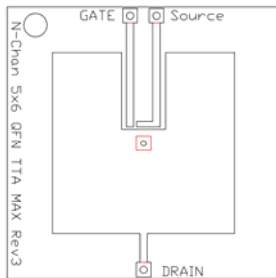
N-Channel CICLON NexFET™ Power MOSFETs CSD16407Q5



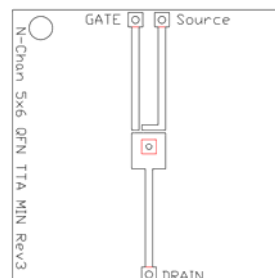
Thermal Characteristics ($T_A = 25^\circ\text{C}$ unless otherwise stated)

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 $R_{\theta JA} = 121^\circ\text{C/W}$ when
mounted on min pad area of
2 oz. Cu.

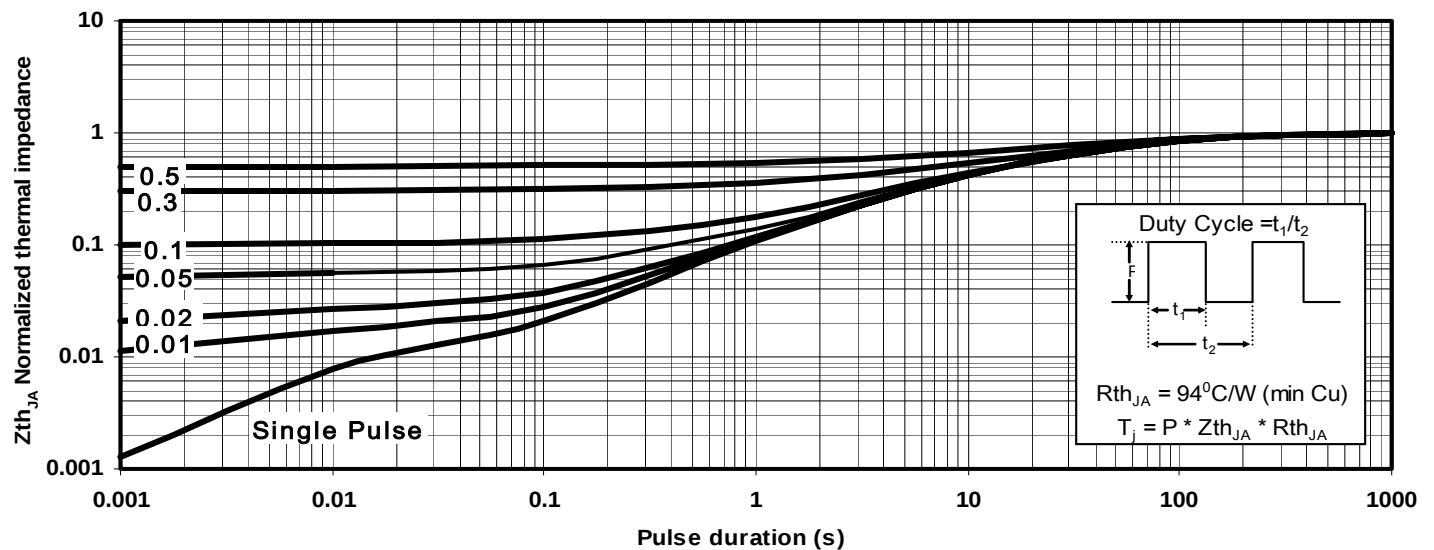


Figure 1: Transient Thermal Impedance

N-Channel CICLON NexFET™ Power MOSFETs CSD16407Q5



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

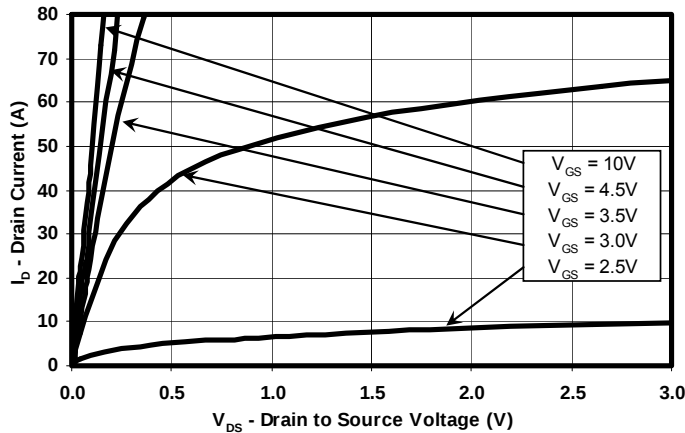


Figure 2: Saturation Characteristics

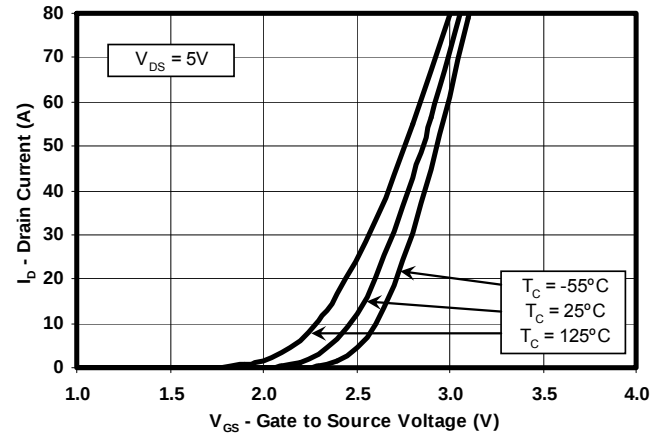


Figure 3: Transfer Characteristics

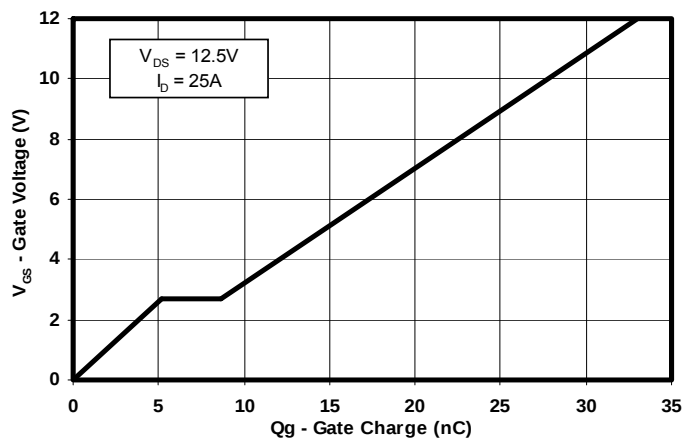


Figure 4: Gate Charge

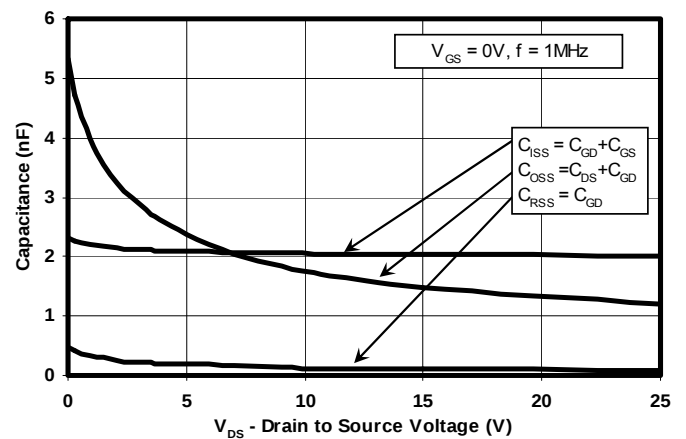


Figure 5: Capacitance

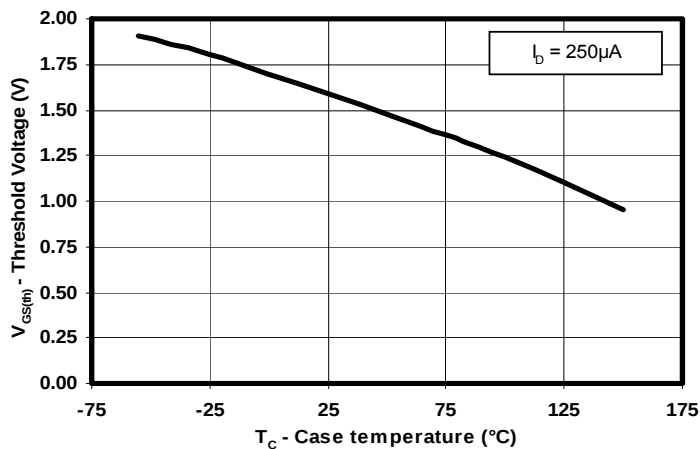


Figure 6: Threshold Voltage vs. Temperature

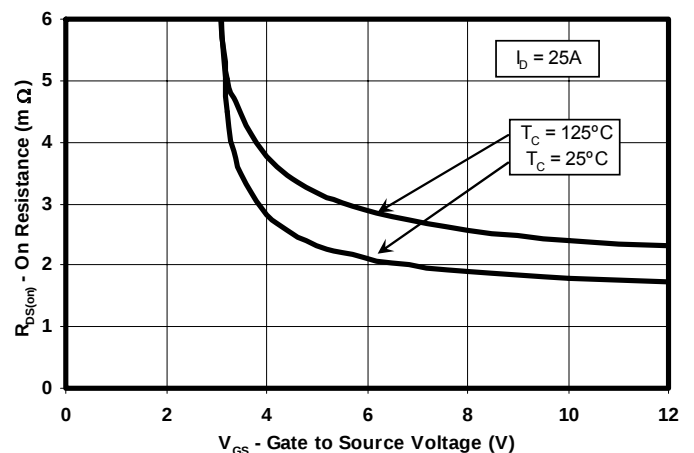


Figure 7: On Resistance vs. Gate Voltage

N-Channel CICLON NexFET™ Power MOSFETs CSD16407Q5



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

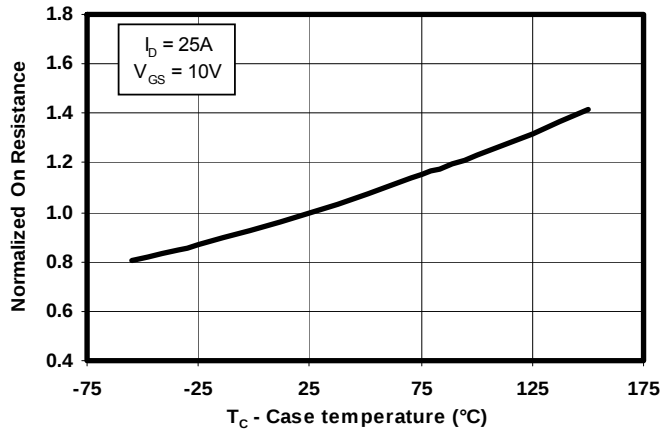


Figure 8: On Resistance vs. Temperature

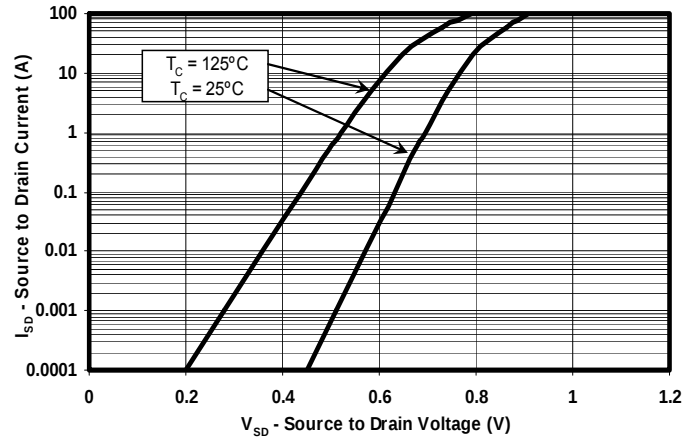


Figure 9: Typical Diode Forward Voltage

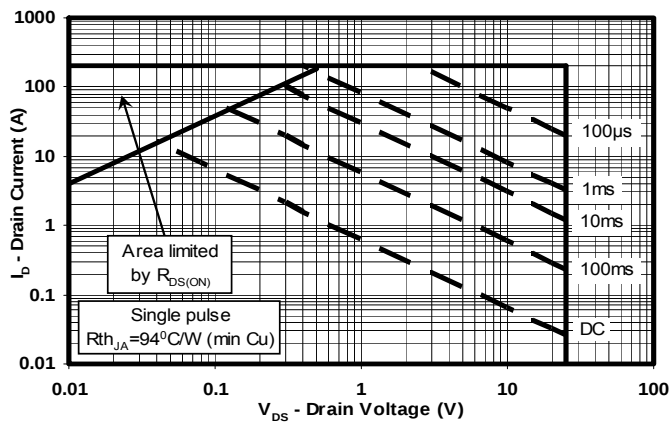


Figure 10: Maximum Safe Operating Area

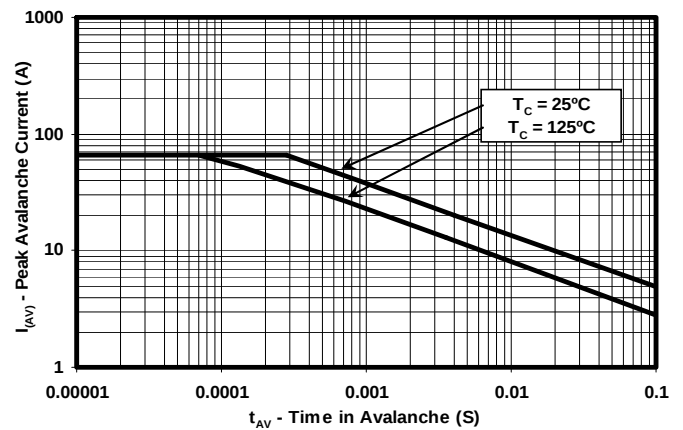


Figure 11: Single Pulse Unclamped Inductive Switching

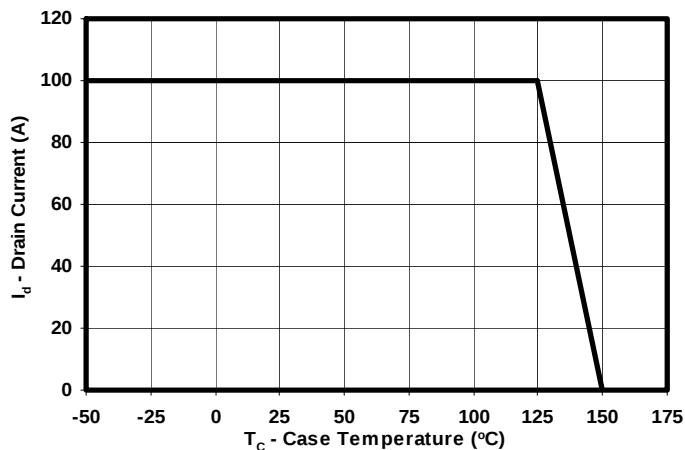


Figure 12: Maximum Drain Current vs. Temperature

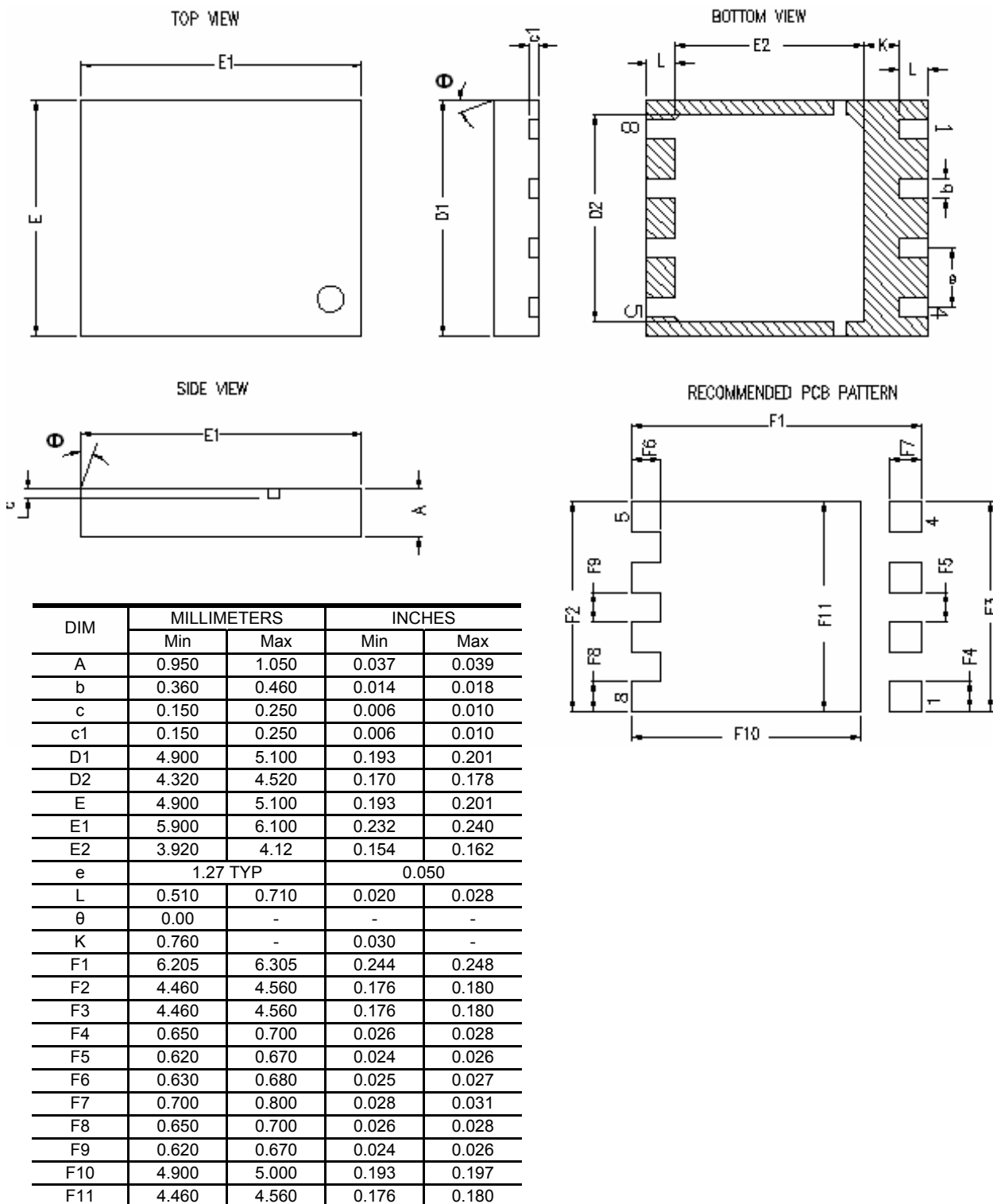
N-Channel

CICLON NexFET™ Power MOSFETs

CSD16407Q5



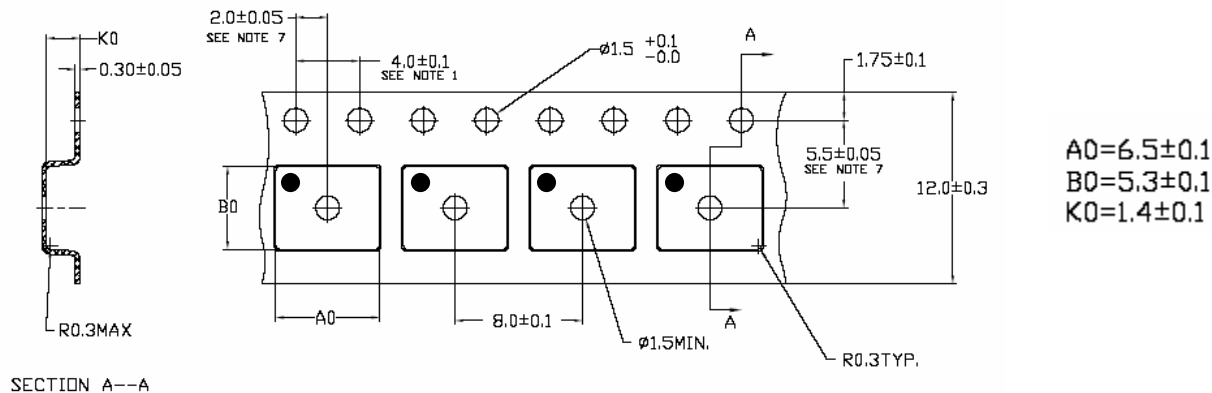
Q5 Package Dimensions



N-Channel CICLON NexFET™ Power MOSFETs CSD16407Q5



CSD16407Q5 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 ± 0.05 mm

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

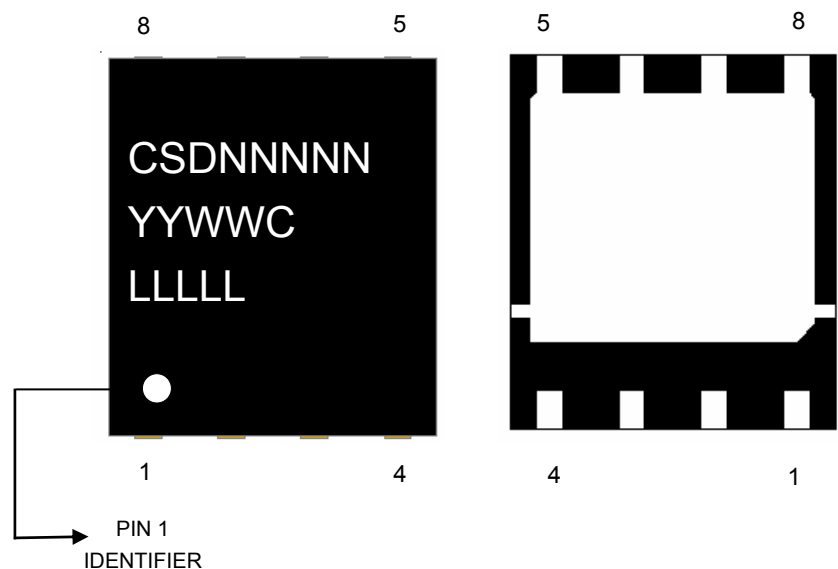
> Philippines = P

> Taiwan = T

> China = C

3rd Line

LLLLL = Last 5 digits of the Wafer Lot #



N-Channel
CICLON NexFET™ Power MOSFETs
CSD16407Q5



Disclaimer

CICLON Semiconductor Device Corp. ("**CICLON**") reserves the right to make corrections, modifications, enhancements, improvements and other changes to its products and services at any time and to discontinue any product or service without notice. Customers should obtain the latest relevant information before placing orders and should verify that such information is current and complete. All products are sold subject to **CICLON**'s terms and conditions of sale supplied at the time of order acknowledgement.

Additional Information

For further information on technology, delivery terms and conditions, or pricing please contact your nearest **CICLON** Semiconductor representative.

CICLON Semiconductor Device Corp.
116 Research Drive, Bethlehem, PA 18015
T 610-849-5100 **F** 610-849-5101