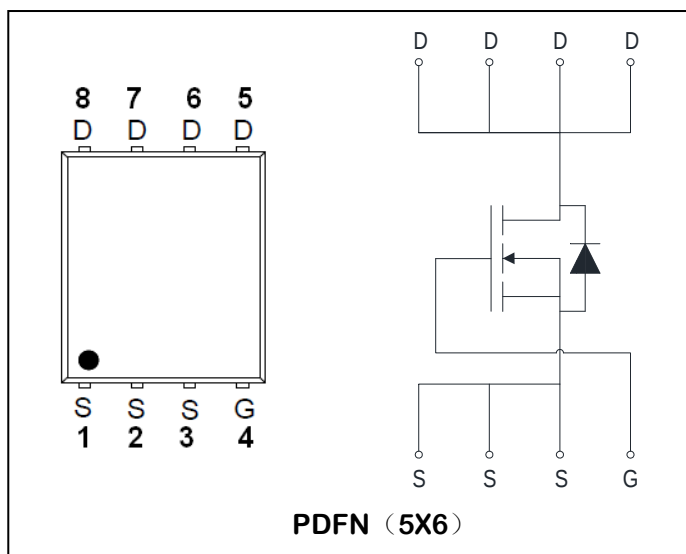


N-Channel Enhancement Mode Field Effect Transistor**PRODUCT SUMMARY**

V_{DSS}	I_D	$R_{DS(ON)}$ (m Ω)
40V	80A	3.5m Ω

Features:

- Low Gate Charge for Fast Switching Application
- Low $R_{DS(ON)}$ to Minimize Conductive Loss
- 100% EAS Guaranteed
- Optimized $V_{(BR)DSS}$ Ruggedness
- Lead-Free, RoHS Compliant

**Description:**

The ADM80N04Q uses advanced trench technology and design to provide excellent $R_{DS(ON)}$ with low gate charge. It can be used in a wide variety of applications.

Absolute Maximum Ratings ($T_A = 25^\circ\text{C}$ unless otherwise specified)

Symbol	Parameter		Ratings	Unit
Common Ratings				
V _{DSS}	Drain-Source Voltage		40	V
V _{GSS}	Gate-Source Voltage		± 20	
T _J	Maximum Junction Temperature		150	°C
T _{STG}	Storage Temperature Range		-55 to 150	°C
I _S	Diode Continuous Forward Current	T _C =25°C	50	A
Mounted on Large Heat Sink				
I _{DM}	300μs Pulse Drain Current Tested ⁽²⁾	T _C =25°C	320	A
I _D	Continuous Drain Current ⁽¹⁾	T _C =25°C	80	A
		T _C =100°C	51	A
P _D	Maximum Power Dissipation	T _C =25°C	65	W

Thermal Characteristics

Symbol	Parameter	Ratings	Unit
R_{thJC}	Thermal resistance junction-case max ⁽¹⁾	1.92	$^\circ\text{C/W}$
R_{thJA}	Thermal resistance junction-ambient max ⁽¹⁾	30	$^\circ\text{C/W}$

Electrical Characteristics (TA=25°C Unless Otherwise Noted)

Symbol	Parameter	Test conditions	Min.	Typ.	Max.	Unit
On/off Characteristics						
V(BR)DSS	Drain-Source Breakdown Voltage	V _{GS} =0V, I _{DS} =250uA	40	--	--	V
I _{DSS}	Zero Gate Voltage Drain Current	V _{DS} =40V,V _{GS} =0V , T _J =25°C	--	--	1	uA
V _{GS(th)}	Gate Threshold Voltage	V _{DS} =V _{GS} , I _{DS} =250uA	1	--	2.5	V
I _{GSS}	Gate Leakage Current	V _{GS} =±20V, V _{DS} =0V	--	--	±100	nA
R _{DS(ON)}	Drain-SourceOn-stateResistance ²⁾	V _{GS} = 10V, I _{DS} =50A	--	3.5	4.5	mΩ
Dynamic Characteristics						
C _{iss}	Input Capacitance	V _{GS} =0V,	--	1560	--	pF
C _{oss}	Output Capacitance	V _{DS} =20V,	--	780	--	
C _{rss}	Reverse Transfer Capacitance	Frequency=1MHz	--	80	--	
Switching Characteristics						
t _{d(ON)}	Turn-on Delay Time	V _{DS} =20V,	--	13	--	nS
t _r	Turn-on Rise Time	I _D = 50A, V _{GS} = 10V,	--	21	--	
t _{d(OFF)}	Turn-off Delay Time	R _{GEN} =4.7 Ω	--	29	--	
t _f	Turn-off Fall Time		--	9	--	
Q _g	Total Gate Charge	V _{DS} =20V, V _{GS} = 10V,	--	29	--	nC
Q _{gs}	Gate-Source Charge	I _{DS} =50A	--	5	--	
Q _{gd}	Gate-Drain Charge		--	9	--	
Avalanche Characteristics						
EAS	Single Pulse Avalanche Energy ³⁾		121	--	--	mJ
Diode Characteristics						
V _{SD}	Diode Forward Voltage ²⁾	I _{SD} = 50A, V _{GS} = 0	--	--	1.2	V
t _{rr}	Reverse Recovery Time	I _{SD} =50A, dI _{SD} /dt=100A/μs	--	18	--	ns
q _{rr}	Reverse Recovery Charge		--	29	--	nC

NOTES:

1. Surface Mounted on FR4 Board, t ≤ 10 sec.

2.The data tested by pulsed , pulse width ≤ 300us , duty cycle ≤ 2%

3.The Min. value is 100% EAS tested guarantee. Limited by TJmax, IAS =22A, VDD = 24V, RG = 50Ω, Starting TJ = 25°C.

Typical Performance Characteristics

Figure 1: On-Region Characteristics

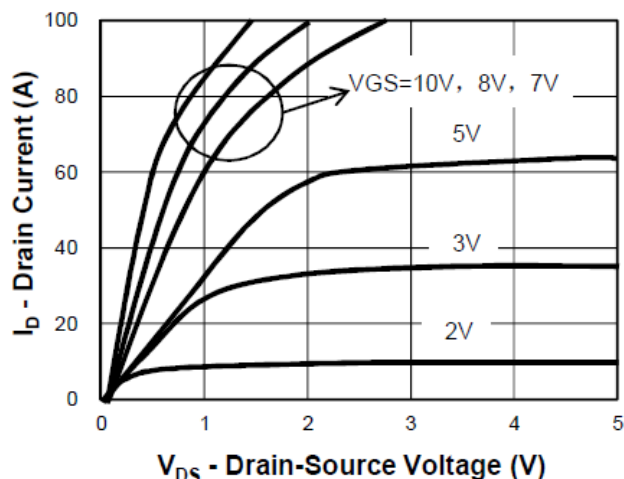


Figure 2: Power Dissipation

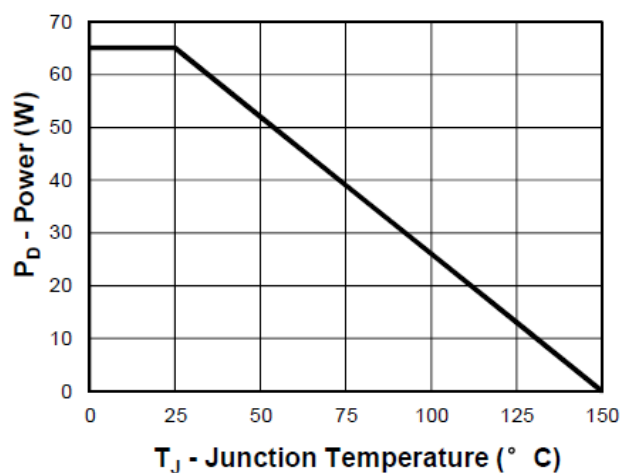


Figure 3: Rdson- Drain Current

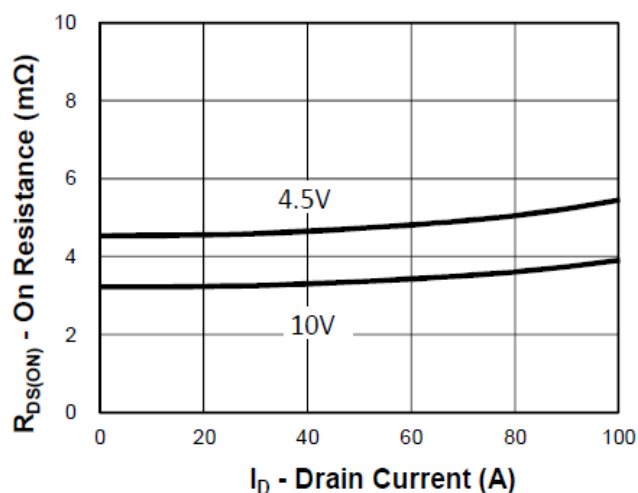


Figure 4: Drain-Source On Resistance

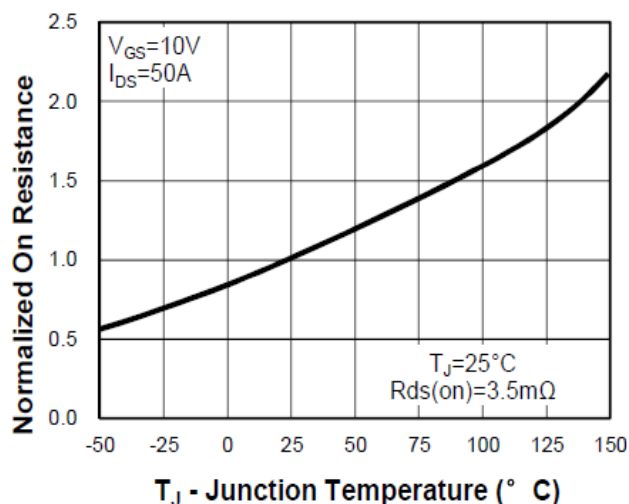


Figure 5: Source- Drain Diode Forward

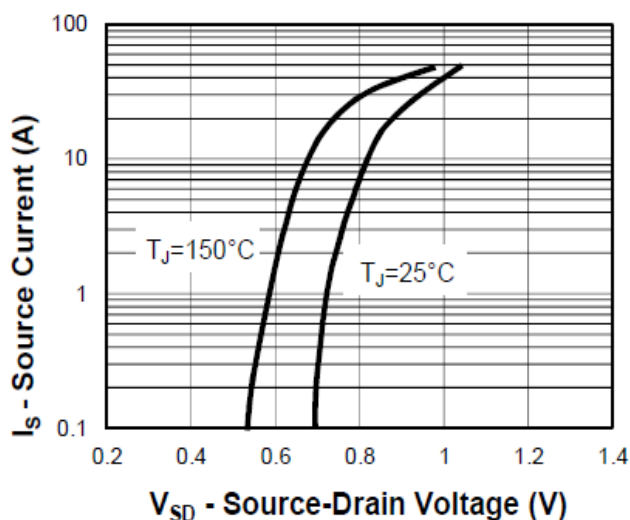


Figure 6: Gate Charge Characteristics

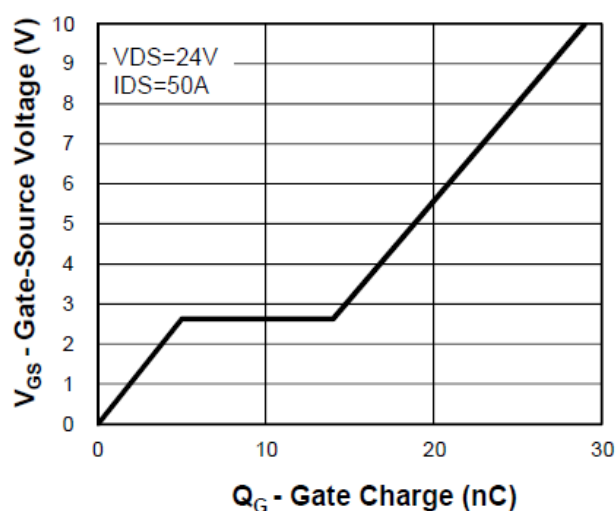


Figure 7: Capacitance vs Vds

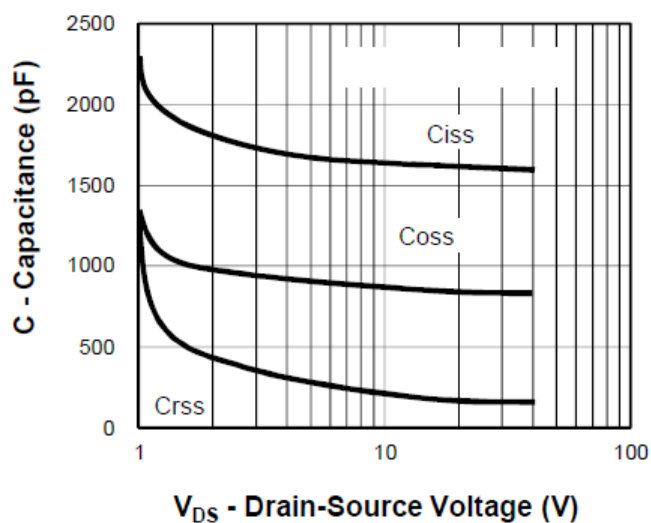


Figure 8: Safe Operation Area

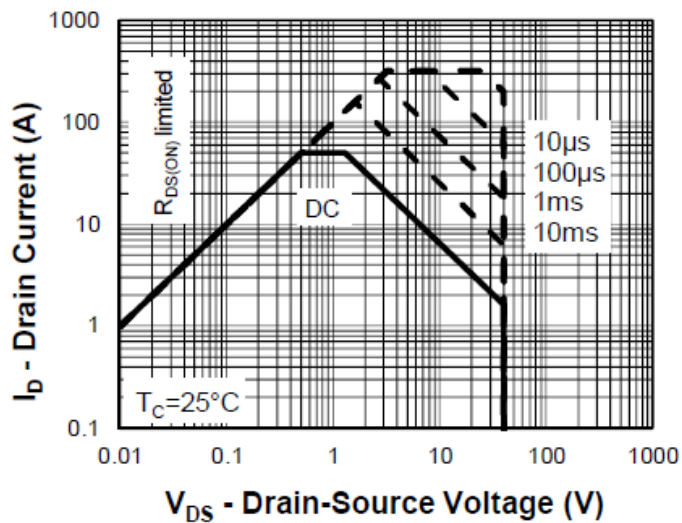


Figure 9: Maximum Drain Current vs. Case Temperature

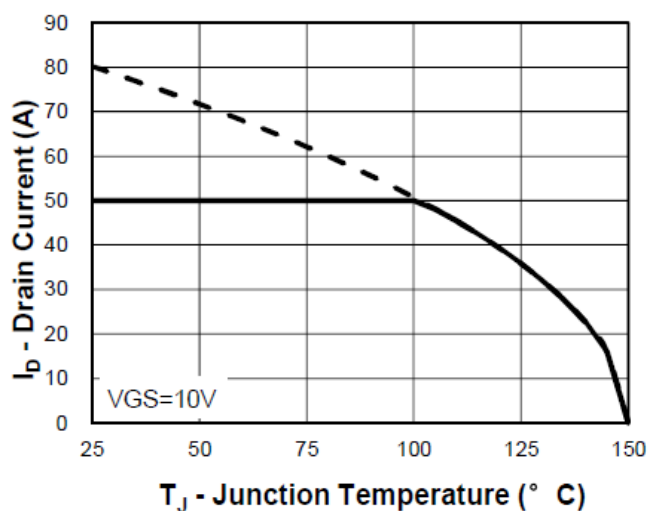


Figure 10: On-Resistance vs. Gate-Source Voltage

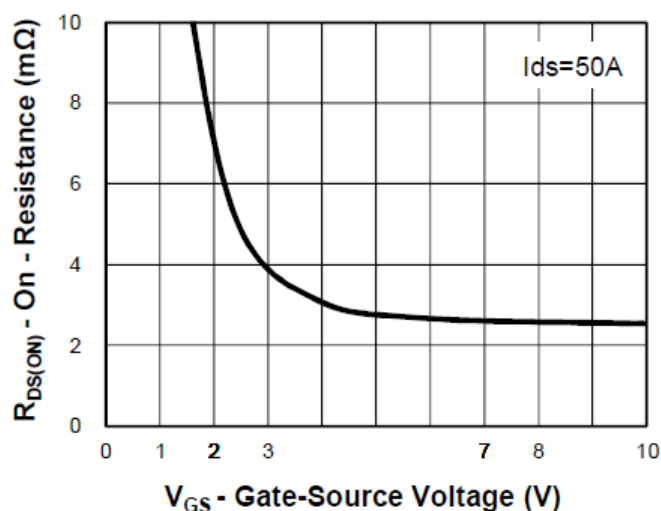
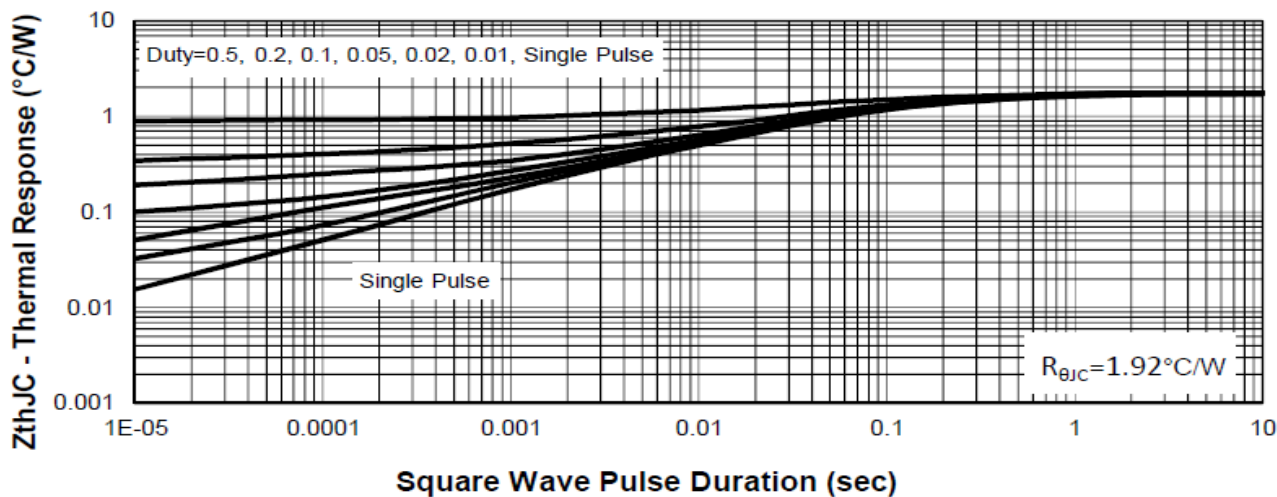
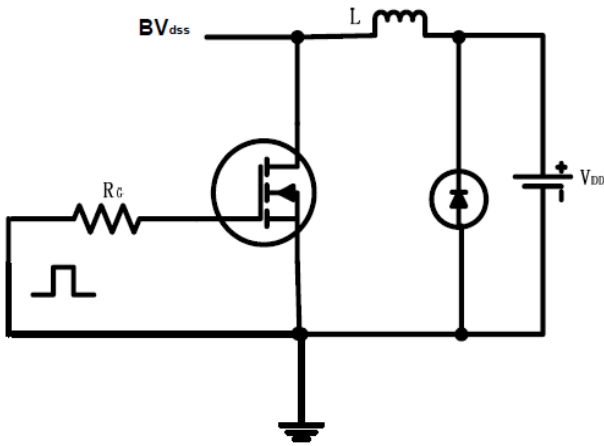


Figure 11: Normalized Maximum Transient Thermal Impedance

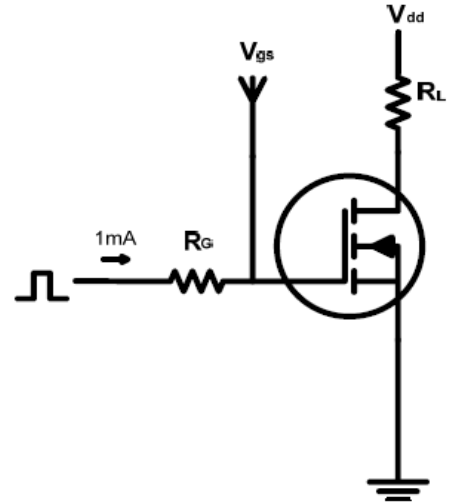


Test circuits and Waveforms

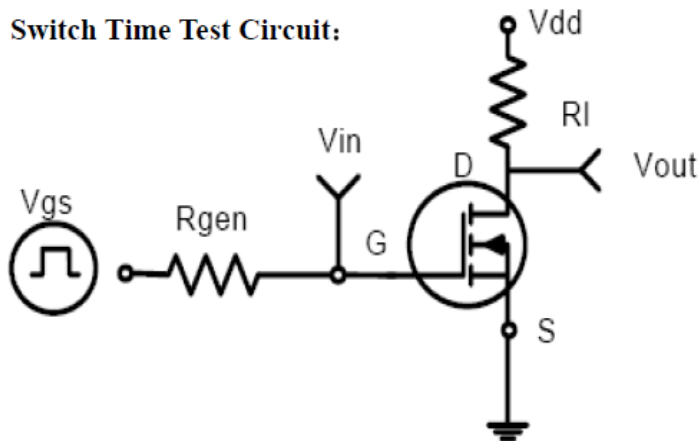
EAS test circuits:



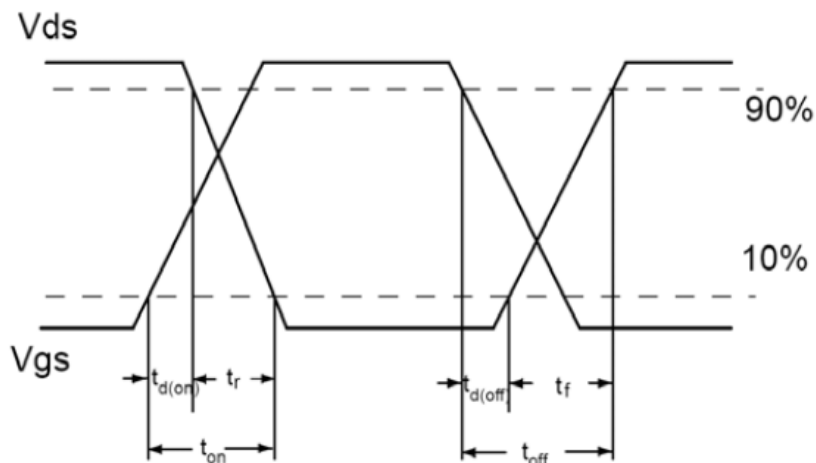
Gate charge test circuit:



Switch Time Test Circuit:

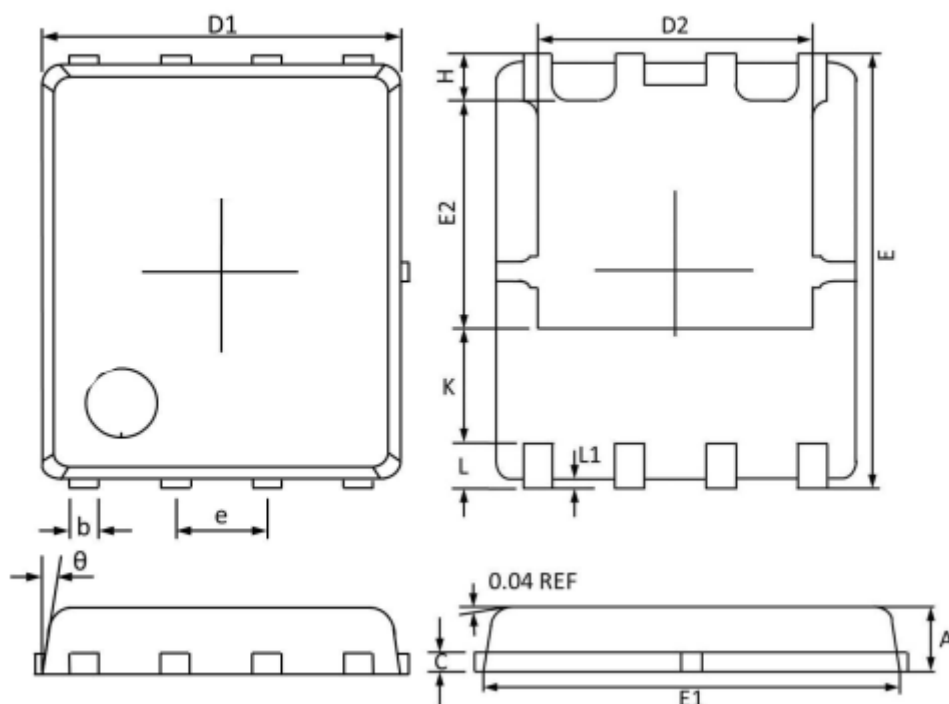


Switch Waveforms:



PACKAGE MECHANICAL DATA

PDFN (5X6) Package Dimension



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	0.800	1.100	0.031	0.043
b	0.330	0.510	0.013	0.020
c	0.200	0.300	0.008	0.012
D1	4.800	5.100	0.189	0.201
D2	3.610	4.100	0.142	0.161
E	5.900	6.200	0.232	0.244
E1	5.700	5.900	0.224	0.232
E2	3.350	3.780	0.132	0.149
H	0.410	0.700	0.016	0.028
K	1.100	1.500	0.043	0.059
e	1.270 TYP.		0.050 TYP.	
L	0.510	0.710	0.020	0.028
L1	0.060	0.200	0.002	0.008
θ	0°	12°	0°	12°