

Product Summary

$V_{(BR)DSS}$	$R_{DS(on)}$	I_D $T_A = 25^\circ C$
-60V	125m Ω @ $V_{GS} = -10V$	-6.6A
	190m Ω @ $V_{GS} = -4.5V$	-5.3A

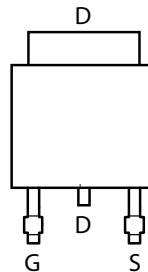
Description and Applications

This new generation MOSFET has been designed to minimize the on-state resistance ($R_{DS(on)}$) and yet maintain superior switching performance, making it ideal for high efficiency power management applications.

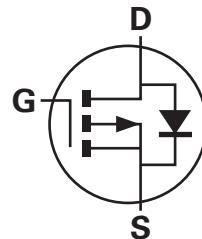
- Backlighting
- DC-DC Converters
- Power management functions



Top View



Pin Out -Top View



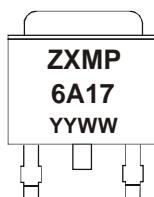
Equivalent Circuit

Ordering Information (Note 1)

Product	Marking	Reel size (inches)	Tape width (mm)	Quantity per reel
ZXMP6A17KTC	See Below	13	16	2,500

Note: 1. Diodes, Inc. defines "Green" products as those which are Eu RoHS compliant and contain no halogens or antimony compounds; further information about Diodes Inc.'s "Green" Policy can be found on our website. For packaging details, go to our website.

Marking Information



ZXMP = Product Type Marking Code, Line 1
 6A17 = Product Type Marking Code, Line 2
 YYWW = Date Code Marking
 YY = Year (ex: 09 = 2009)
 WW = Week (01-52)

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

Characteristic			Symbol	Value	Unit
Drain-Source voltage			V_{DSS}	-60	V
Gate-Source voltage			V_{GS}	± 20	V
Continuous Drain current	$V_{GS} = 10\text{V}$	(Note 3)	I_D	6.6	A
		$T_A = 70^\circ\text{C}$ (Note 3)		5.3	
		(Note 2)		4.4	
Pulsed Drain current	$V_{GS} = 10\text{V}$	(Note 4)	I_{DM}	20.3	A
Continuous Source current (Body diode)		(Note 3)	I_S	9.3	A
Pulsed Source current (Body diode)		(Note 4)	I_{SM}	20.3	A

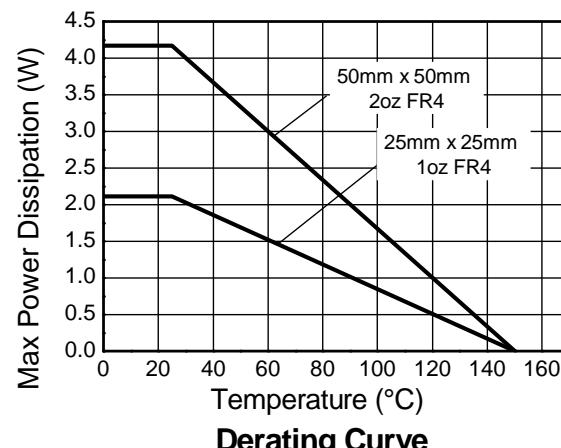
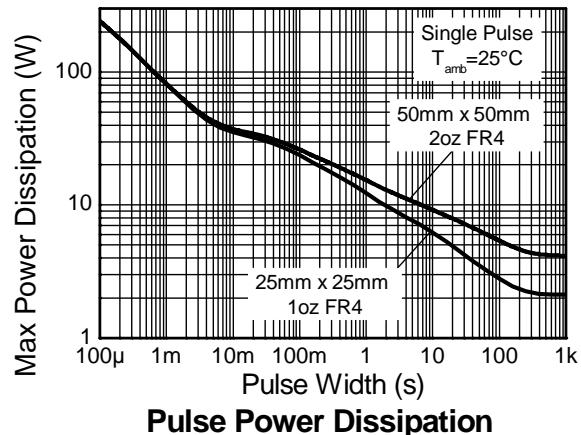
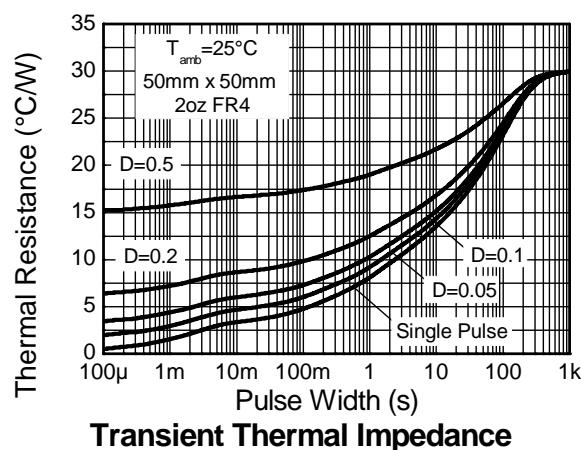
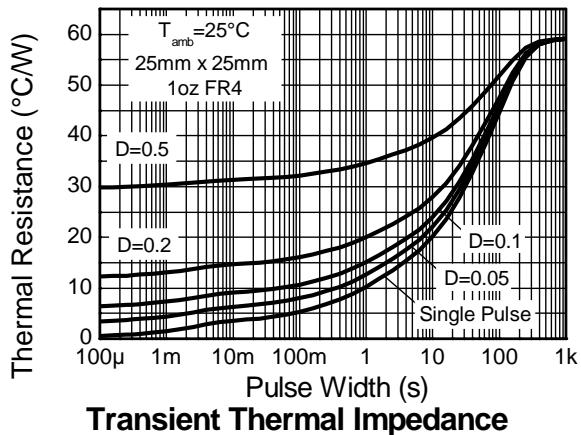
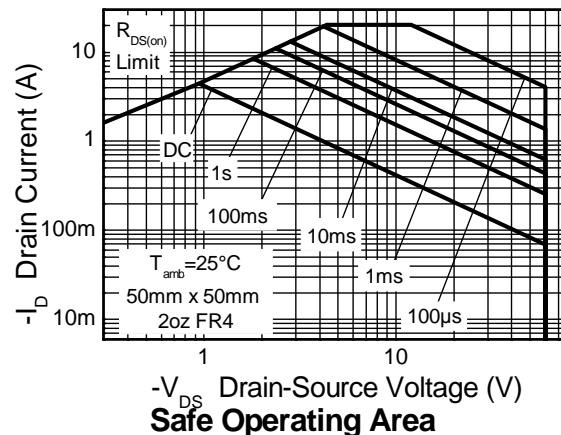
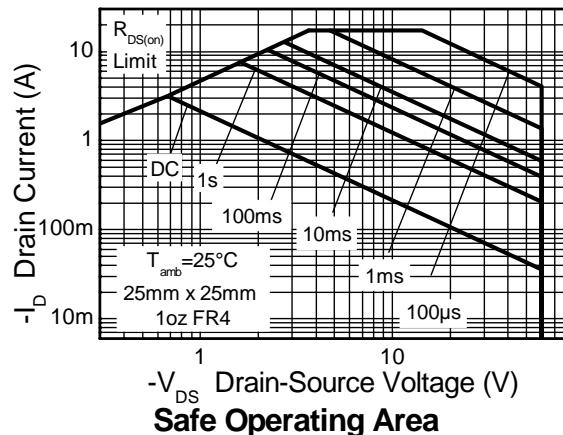
Thermal Characteristics @ $T_A = 25^\circ\text{C}$ unless otherwise specified

Characteristic		Symbol	Value	Unit
Power dissipation Linear derating factor	(Note 2)	P_D	4.17	W mW/°C
	(Note 3)		33.3	
	(Note 5)		9.25	
			74.0	
Thermal Resistance, Junction to Ambient	(Note 2)	$R_{\theta JA}$	2.11	°C/W
	(Note 3)		16.8	
	(Note 5)		59.1	
Thermal Resistance, Junction to Lead	(Note 6)	$R_{\theta JL}$	2.41	°C
Operating and storage temperature range		T_J, T_{STG}	-55 to 150	

Notes:

2. For a device surface mounted on 50mm x 50mm x 1.6mm FR4 PCB with high coverage of single sided 2oz copper, in still air conditions; the device is measured when operating in a steady-state condition.
3. Same as note 2, except the device is measured at $t \leq 10$ sec.
4. Same as note 2, except the device is pulsed with $D = 0.02$ and pulse width 300 μs . The pulse current is limited by the maximum junction temperature.
5. For a device surface mounted on 25mm x 25mm x 1.6mm FR4 PCB with high coverage of single sided 1oz copper, in still air conditions; the device is measured when operating in a steady-state condition.
6. Thermal resistance from junction to solder-point (at the end of the drain lead).

Thermal Characteristics



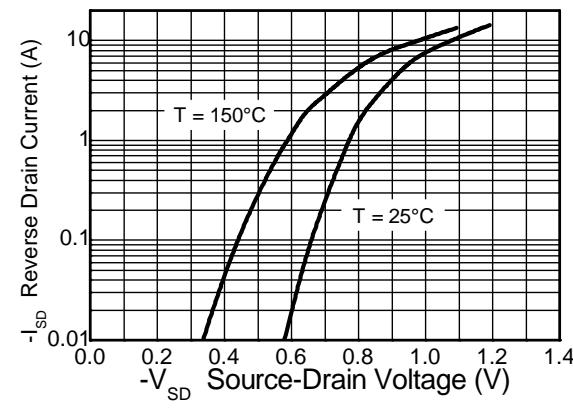
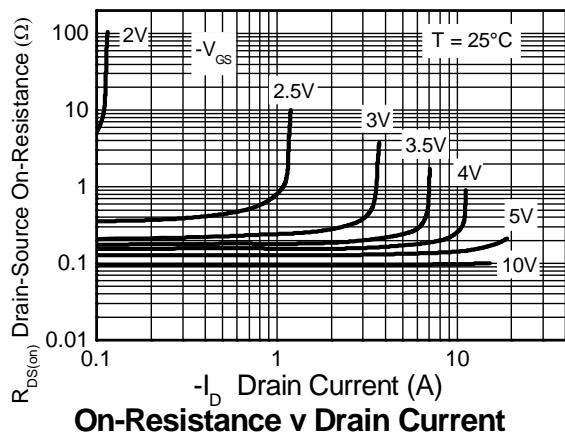
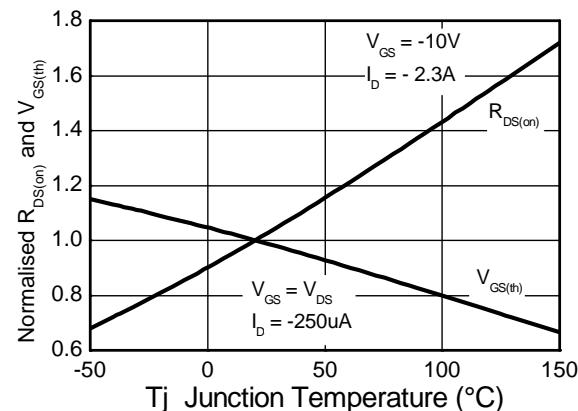
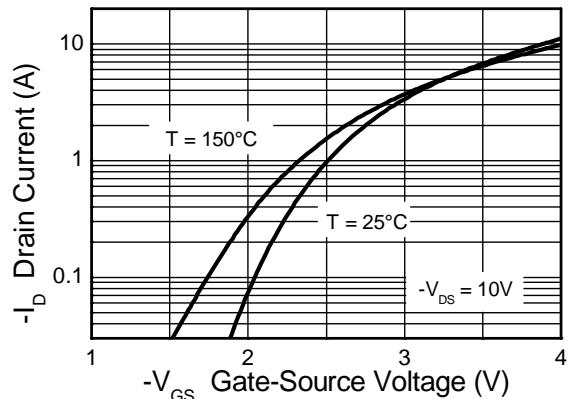
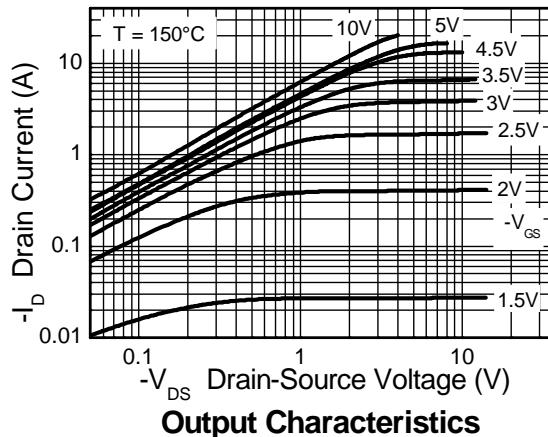
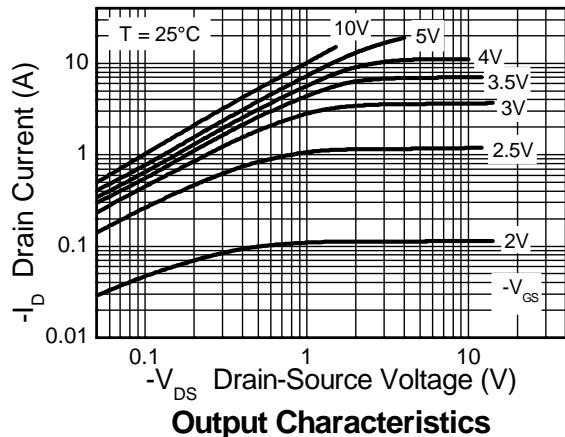
Electrical Characteristics @ $T_A = 25^\circ\text{C}$ unless otherwise specified

Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
OFF CHARACTERISTICS						
Drain-Source Breakdown Voltage	BV_{DSS}	-60	—	—	V	$I_D = -250\mu\text{A}$, $V_{GS} = 0\text{V}$
Zero Gate Voltage Drain Current	I_{DSS}	—	—	-0.5	μA	$V_{DS} = -60\text{V}$, $V_{GS} = 0\text{V}$
Gate-Source Leakage	I_{GSS}	—	—	± 100	nA	$V_{GS} = \pm 20\text{V}$, $V_{DS} = 0\text{V}$
ON CHARACTERISTICS						
Gate Threshold Voltage	$V_{GS(\text{th})}$	-1.0	—	—	V	$I_D = -250\mu\text{A}$, $V_{DS} = V_{GS}$
Static Drain-Source On-Resistance (Note 7)	$R_{DS(\text{ON})}$	—	—	0.125 0.190	Ω	$V_{GS} = -10\text{V}$, $I_D = -2.3\text{A}$ $V_{GS} = -4.5\text{V}$, $I_D = -1.9\text{A}$
Forward Transconductance (Notes 7 & 8)	g_{fs}	—	4.7	—	S	$V_{DS} = -15\text{V}$, $I_D = -2.2\text{A}$
Diode Forward Voltage (Note 7)	V_{SD}	—	-0.85	-0.95	V	$I_S = -2\text{A}$, $V_{GS} = 0\text{V}$
Reverse recovery time (Note 8)	t_{rr}	—	25.1	—	ns	$I_S = -1.7\text{A}$, $di/dt = 100\text{A}/\mu\text{s}$
Reverse recovery charge (Note 8)	Q_{rr}	—	27.2	—	nC	
DYNAMIC CHARACTERISTICS (Note 8)						
Input Capacitance	C_{iss}	—	637	—	pF	$V_{DS} = -30\text{V}$, $V_{GS} = 0\text{V}$ $f = 1\text{MHz}$
Output Capacitance	C_{oss}	—	70	—	pF	
Reverse Transfer Capacitance	C_{rss}	—	53	—	pF	
Total Gate Charge	Q_g	—	9.0	—	nC	$V_{GS} = -4.5\text{V}$ $V_{GS} = -10\text{V}$ $I_D = -2.2\text{A}$
Total Gate Charge	Q_g	—	17.7	—	nC	
Gate-Source Charge	Q_{gs}	—	1.6	—	nC	
Gate-Drain Charge	Q_{gd}	—	4.4	—	nC	
Turn-On Delay Time (Note 9)	$t_{D(\text{on})}$	—	2.6	—	ns	$V_{DD} = -30\text{V}$, $V_{GS} = -10\text{V}$ $I_D = -1\text{A}$, $R_G \geq 6.0\Omega$
Turn-On Rise Time (Note 9)	t_r	—	3.4	—	ns	
Turn-Off Delay Time (Note 9)	$t_{D(\text{off})}$	—	26.2	—	ns	
Turn-Off Fall Time (Note 9)	t_f	—	11.3	—	ns	

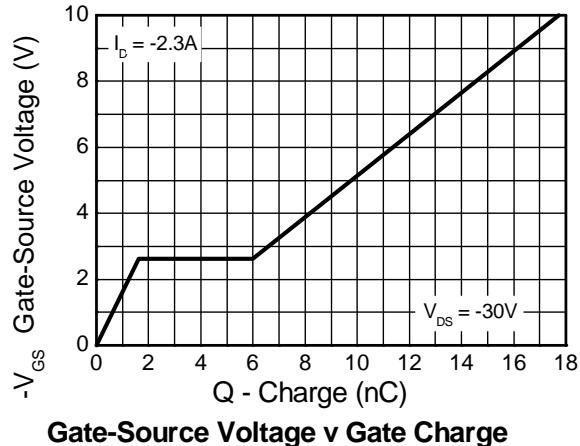
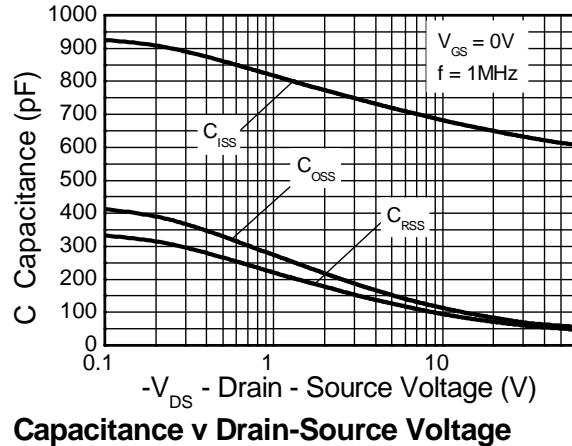
Notes:

7. Measured under pulsed conditions. Pulse width $\leq 300\mu\text{s}$; duty cycle $\leq 2\%$
8. For design aid only, not subject to production testing.
9. Switching characteristics are independent of operating junction temperatures.

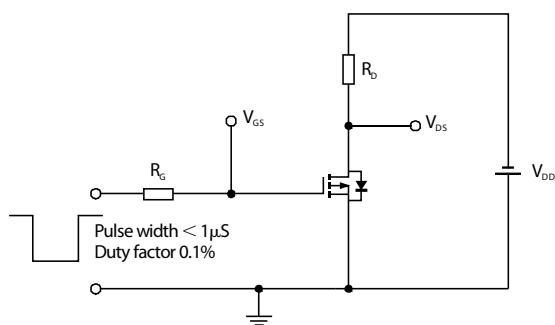
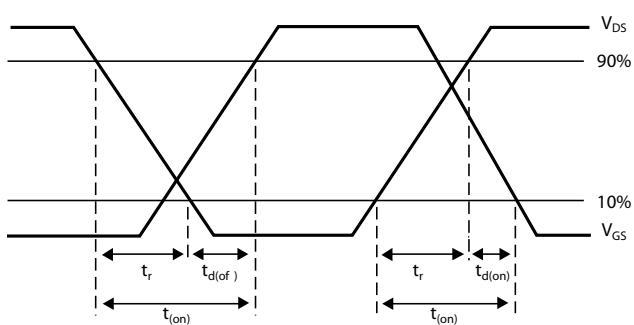
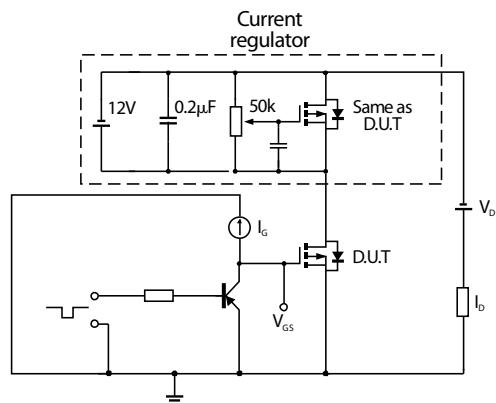
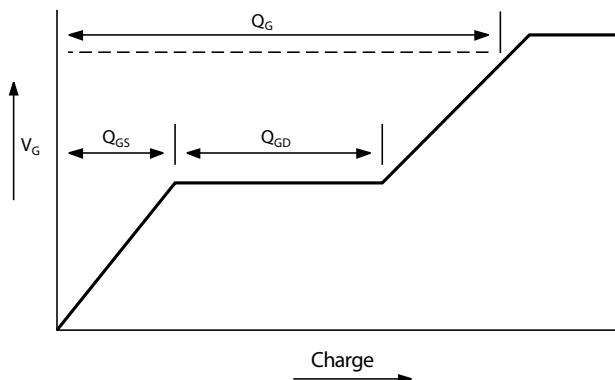
Typical Characteristics



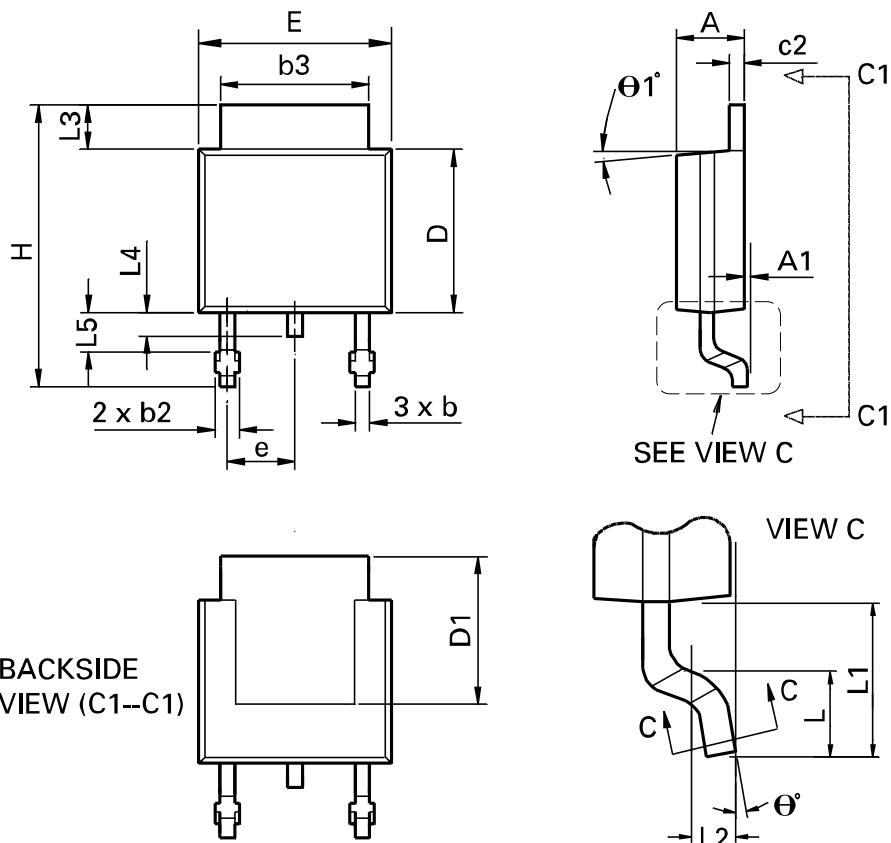
Typical Characteristics - continued



Test Circuits

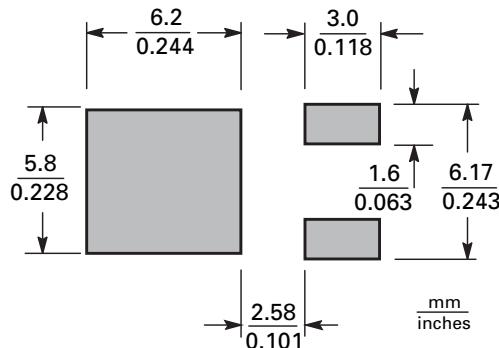


Package Outline Dimensions



DIM	Inches		Millimeters		DIM	Inches		Millimeters	
	Min	Max	Min	Max		Min	Max	Min	Max
A	0.086	0.094	2.18	2.39	e	0.090 BSC		2.29 BSC	
A1	-	0.005	-	0.127	H	0.370	0.410	9.40	10.41
b	0.020	0.035	0.508	0.89	L	0.055	0.070	1.40	1.78
b2	0.030	0.045	0.762	1.14	L1	0.108 REF		2.74 REF	
b3	0.205	0.215	5.21	5.46	L2	0.020 BSC		0.508 BSC	
c	0.018	0.024	0.457	0.61	L3	0.035	0.065	0.89	1.65
c2	0.018	0.023	0.457	0.584	L4	0.025	0.040	0.635	1.016
D	0.213	0.245	5.41	6.22	L5	0.045	0.060	1.14	1.52
D1	0.205	-	5.21	-	θ1°	0°	10°	0°	10°
E	0.250	0.265	6.35	6.73	θ°	0°	15°	0°	15°
E1	0.170	-	4.32	-	-	-	-	-	-

Suggested Pad Layout



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