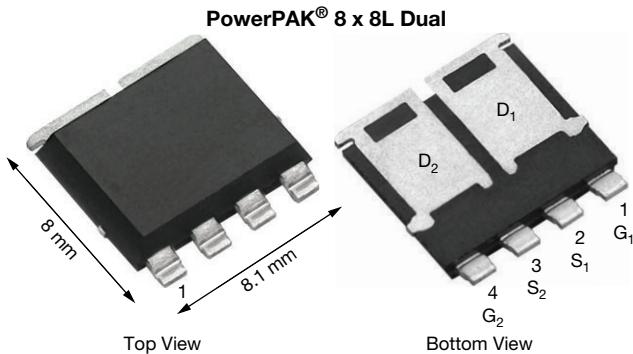


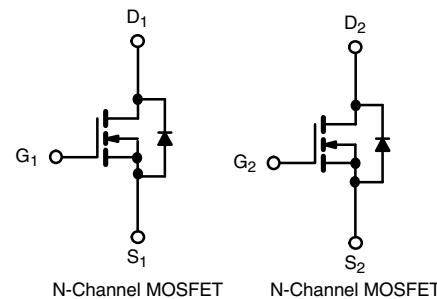
## Automotive Dual N-Channel 40 V (D-S) 175 °C MOSFET



### FEATURES

- TrenchFET® power MOSFET
- AEC-Q101 qualified
- 100 %  $R_g$  and UIS tested
- Fully lead (Pb)-free device
- Material categorization:  
for definitions of compliance please see  
[www.vishay.com/doc?99912](http://www.vishay.com/doc?99912)

AUTOMOTIVE GRADE


RoHS  
COMPLIANT  
HALOGEN  
FREE


PRODUCT SUMMARY	
$V_{DS}$ (V)	40
$R_{DS(on)}$ ( $\Omega$ ) at $V_{GS} = 10$ V	0.0039
$R_{DS(on)}$ ( $\Omega$ ) at $V_{GS} = 4.5$ V	0.0047
$I_D$ (A) per leg	100
Configuration	Dual
Package	PowerPAK 8 x 8L

ABSOLUTE MAXIMUM RATINGS ( $T_C = 25$ °C, unless otherwise noted)			
PARAMETER	SYMBOL	LIMIT	UNIT
Drain-source voltage	$V_{DS}$	40	V
Gate-source voltage	$V_{GS}$	$\pm 20$	
Continuous drain current	$I_D$	100	A
$T_C = 125$ °C		60	
Continuous source current (diode conduction) <sup>a</sup>	$I_S$	68	
Pulsed drain current <sup>b</sup>	$I_{DM}$	400	
Single pulse avalanche current	$I_{AS}$	50	
Single pulse avalanche energy	$E_{AS}$	125	mJ
Maximum power dissipation <sup>b</sup>	$P_D$	75	W
$T_C = 125$ °C		25	
Operating junction and storage temperature range	$T_J, T_{stg}$	-55 to +175	°C
Soldering recommendations (peak temperature) <sup>d, e</sup>		260	

THERMAL RESISTANCE RATINGS			
PARAMETER	SYMBOL	LIMIT	UNIT
Junction-to-ambient	$R_{thJA}$	80	°C/W
Junction-to-case (drain)		2	

#### Notes

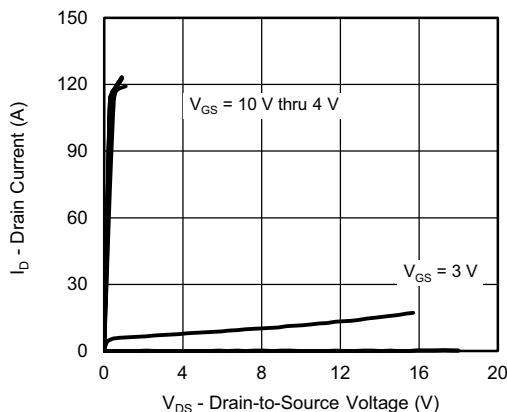
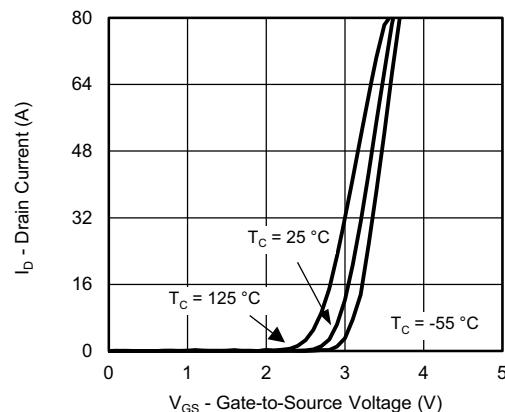
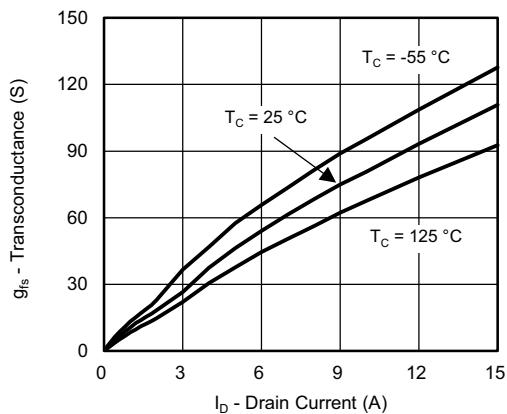
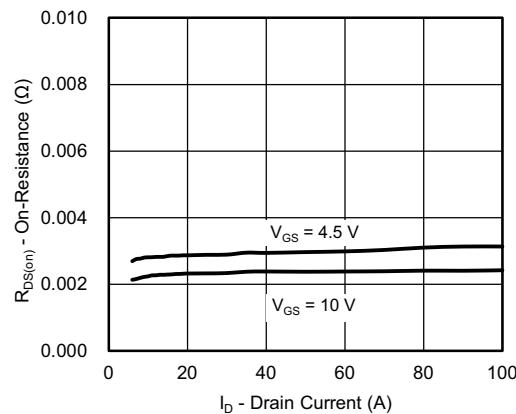
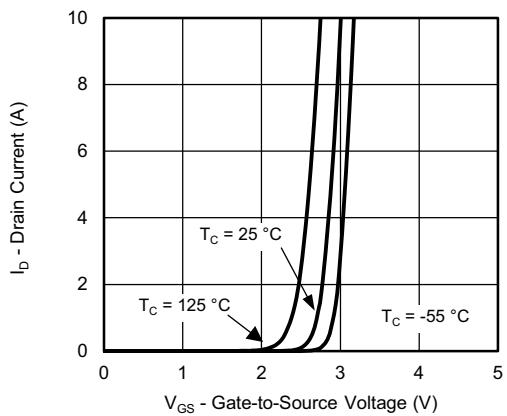
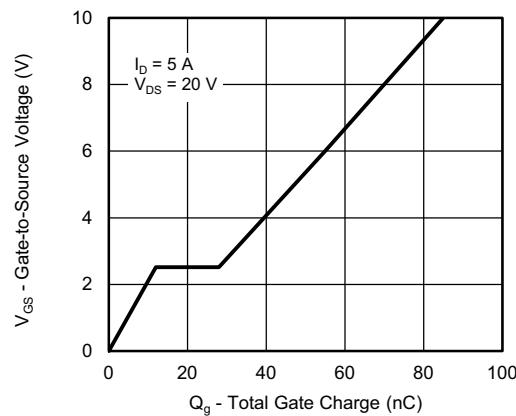
- Package limited
- Pulse test; pulse width  $\leq 300$   $\mu$ s, duty cycle  $\leq 2$  %
- When mounted on 1" square PCB (FR4 material)
- See solder profile ([www.vishay.com/doc?73257](http://www.vishay.com/doc?73257)). The PowerPAK 8 x 8L is a leadless package. The end of the lead terminal is exposed copper (not plated) as a result of the singulation process in manufacturing. A solder fillet at the exposed copper tip cannot be guaranteed and is not required to ensure adequate bottom side solder interconnection
- Rework conditions: manual soldering with a soldering iron is not recommended for leadless components

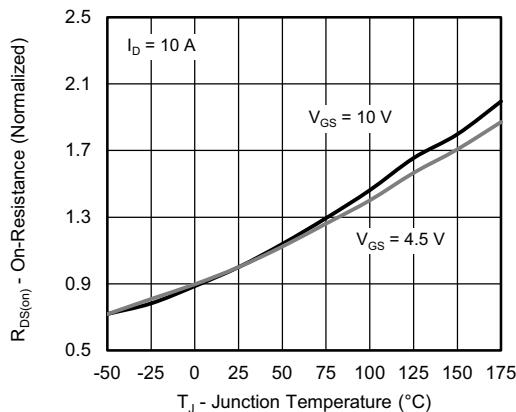
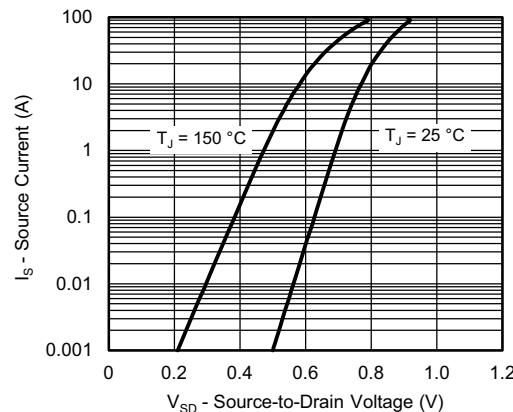
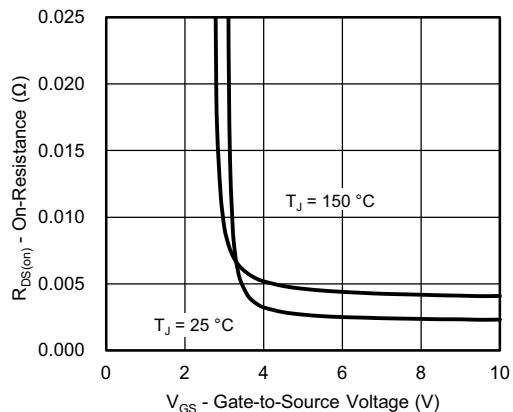
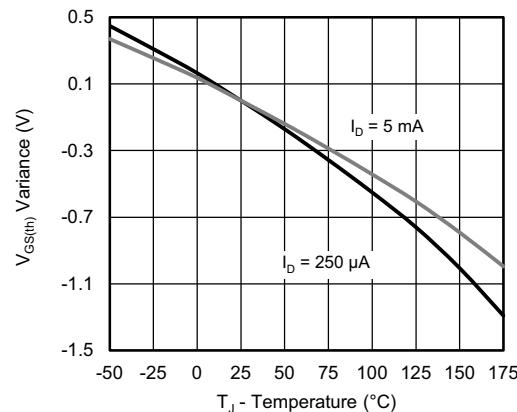
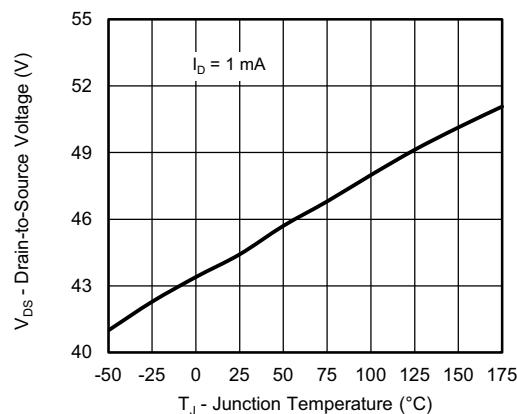
<b>SPECIFICATIONS</b> ( $T_C = 25^\circ\text{C}$ , unless otherwise noted)								
PARAMETER	SYMBOL	TEST CONDITIONS		MIN.	TYP.	MAX.	UNIT	
<b>Static</b>								
Drain-source breakdown voltage	$V_{DS}$	$V_{GS} = 0$ , $I_D = 250 \mu\text{A}$		40	-	-	V	
Gate-source threshold voltage	$V_{GS(\text{th})}$	$V_{DS} = V_{GS}$ , $I_D = 250 \mu\text{A}$		1.5	2	2.5		
Gate-source leakage	$I_{GSS}$	$V_{DS} = 0 \text{ V}$ , $V_{GS} = \pm 20 \text{ V}$		-	-	$\pm 100$	nA	
Zero gate voltage drain current	$I_{DSS}$	$V_{GS} = 0 \text{ V}$	$V_{DS} = 20 \text{ V}$	-	-	1	$\mu\text{A}$	
		$V_{GS} = 0 \text{ V}$	$V_{DS} = 40 \text{ V}$ , $T_J = 125^\circ\text{C}$	-	-	50		
		$V_{GS} = 0 \text{ V}$	$V_{DS} = 40 \text{ V}$ , $T_J = 175^\circ\text{C}$	-	-	150		
On-state drain current <sup>a</sup>	$I_{D(\text{on})}$	$V_{GS} = 10 \text{ V}$	$V_{DS} \geq 5 \text{ V}$	40	-	-	A	
Drain-source on-state resistance <sup>a</sup>	$R_{DS(\text{on})}$	$V_{GS} = 10 \text{ V}$	$I_D = 20 \text{ A}$	-	0.0034	0.0039	$\Omega$	
		$V_{GS} = 4.5 \text{ V}$	$I_D = 10 \text{ A}$	-	0.0039	0.0047		
		$V_{GS} = 10 \text{ V}$	$I_D = 20 \text{ A}$ , $T_J = 125^\circ\text{C}$	-	-	0.0074		
		$V_{GS} = 10 \text{ V}$	$I_D = 20 \text{ A}$ , $T_J = 175^\circ\text{C}$	-	-	0.0091		
Forward transconductance <sup>b</sup>	$g_{fs}$	$V_{DS} = 15 \text{ V}$ , $I_D = 15 \text{ A}$		-	105	-	S	
<b>Dynamic</b> <sup>b</sup>								
Input capacitance	$C_{iss}$	$V_{GS} = 0 \text{ V}$	$V_{DS} = 20 \text{ V}$ , $f = 1 \text{ MHz}$	-	4695	5900	pF	
Output capacitance	$C_{oss}$			-	637	800		
Reverse transfer capacitance	$C_{rss}$			-	259	330		
Total gate charge <sup>c</sup>	$Q_g$	$V_{GS} = 10 \text{ V}$	$V_{DS} = 20 \text{ V}$ , $I_D = 40 \text{ A}$	-	85	120	nC	
Gate-source charge <sup>c</sup>	$Q_{gs}$			-	10	-		
Gate-drain charge <sup>c</sup>	$Q_{gd}$			-	12	-		
Gate resistance	$R_g$	$f = 1 \text{ MHz}$		0.7	1.5	3.0	$\Omega$	
Turn-on delay time <sup>c</sup>	$t_{d(\text{on})}$	$V_{DD} = 20 \text{ V}$ , $R_L = 0.5 \Omega$ $I_D \approx 40 \text{ A}$ , $V_{GEN} = 10 \text{ V}$ , $R_g = 1 \Omega$				-	ns	
Rise time <sup>c</sup>	$t_r$	-		7.5				
Turn-off delay time <sup>c</sup>	$t_{d(\text{off})}$	-		30				
Fall time <sup>c</sup>	$t_f$	-		14				
<b>Source-Drain Diode Ratings and Characteristics</b> <sup>b</sup>								
Pulsed current <sup>a</sup>	$I_{SM}$			-	-	200	A	
Forward voltage	$V_{SD}$	$I_F = 40 \text{ A}$ , $V_{GS} = 0$		-	1	1.2	V	

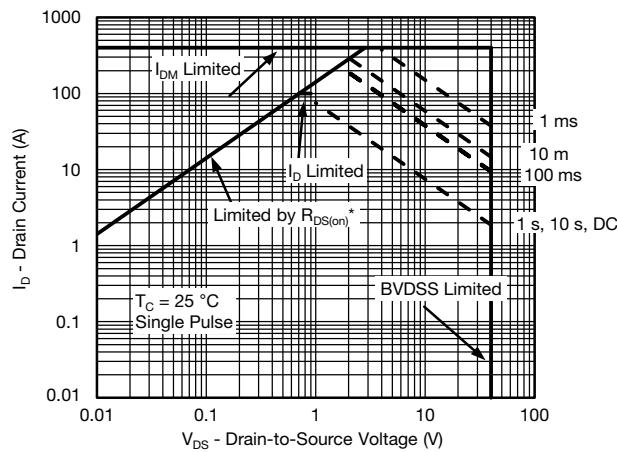
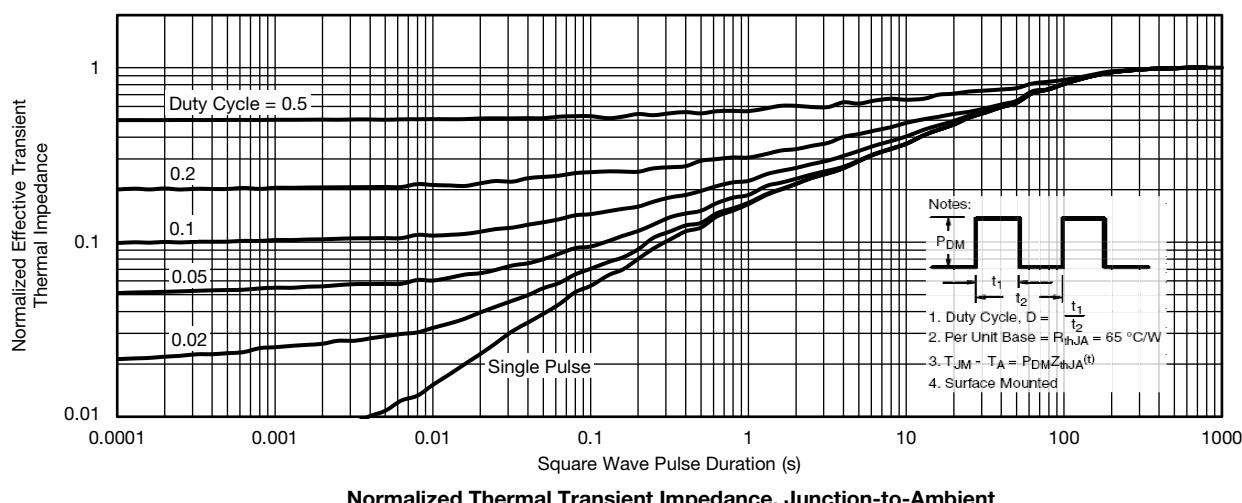
**Notes**

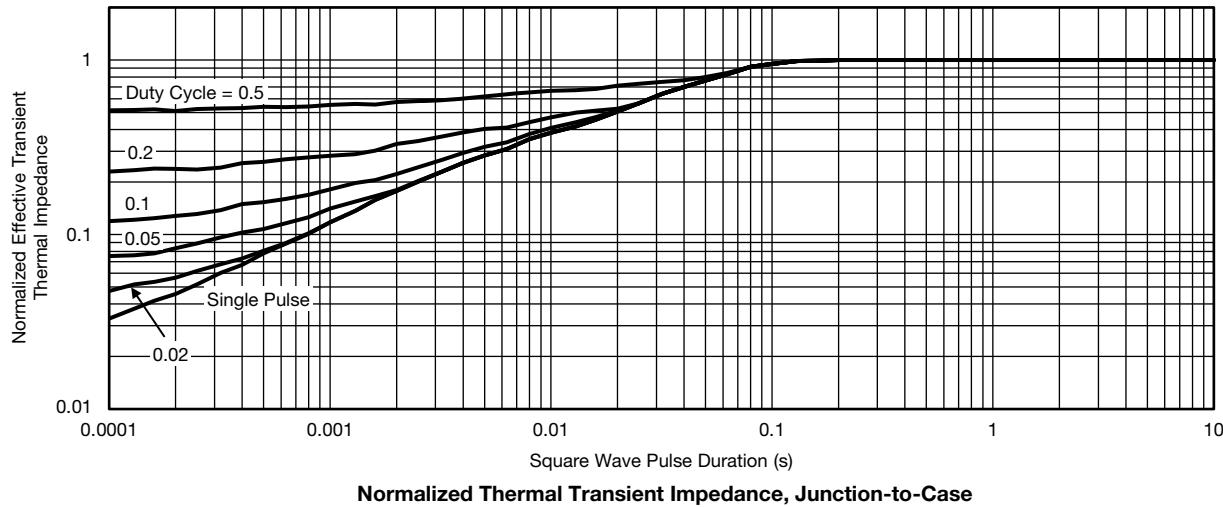
- a. Pulse test; pulse width  $\leq 300 \mu\text{s}$ , duty cycle  $\leq 2\%$
- b. Guaranteed by design, not subject to production testing
- c. Independent of operating temperature

Stresses beyond those listed under "Absolute Maximum Ratings" may cause permanent damage to the device. These are stress ratings only, and functional operation of the device at these or any other conditions beyond those indicated in the operational sections of the specifications is not implied. Exposure to absolute maximum rating conditions for extended periods may affect device reliability.

**TYPICAL CHARACTERISTICS** ( $T_A = 25^\circ\text{C}$ , unless otherwise noted)

**Output Characteristics**

**Transfer Characteristics**

**Transconductance**

**On-Resistance vs. Drain Current**

**Transfer Characteristics**

**Gate Charge**

**TYPICAL CHARACTERISTICS** ( $T_A = 25^\circ\text{C}$ , unless otherwise noted)

**On-Resistance vs. Junction Temperature**

**Source Drain Diode Forward Voltage**

**On-Resistance vs. Gate-to-Source Voltage**

**Threshold Voltage**

**Drain Source Breakdown vs. Junction Temperature**

**THERMAL RATINGS ( $T_A = 25^\circ\text{C}$ , unless otherwise noted)**

**Safe Operating Area**

**Normalized Thermal Transient Impedance, Junction-to-Ambient**

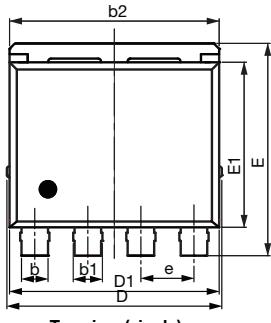
**THERMAL RATINGS ( $T_A = 25^\circ\text{C}$ , unless otherwise noted)**

**Note**

- The characteristics shown in the two graphs
  - Normalized Transient Thermal Impedance Junction to Ambient ( $25^\circ\text{C}$ )
  - Normalized Transient Thermal Impedance Junction to Case ( $25^\circ\text{C}$ )

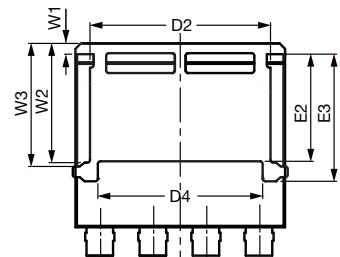
are given for general guidelines only to enable the user to get a "ball park" indication of part capabilities. The data are extracted from single pulse transient thermal impedance characteristics which are developed from empirical measurements. The latter is valid for the part mounted on printed circuit board - FR4, size 1" x 1" x 0.062", double sided with 2 oz. copper, 100 % on both sides. The part capabilities can widely vary depending on actual application parameters and operating conditions.

Vishay Siliconix maintains worldwide manufacturing capability. Products may be manufactured at one of several qualified locations. Reliability data for Silicon Technology and Package Reliability represent a composite of all qualified locations. For related documents such as package/tape drawings, part marking, and reliability data, see [www.vishay.com/ppg?62796](http://www.vishay.com/ppg?62796).

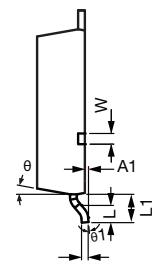
### PowerPAK® 8 x 8L Case Outline



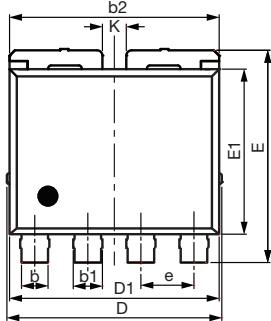
Top view (single)



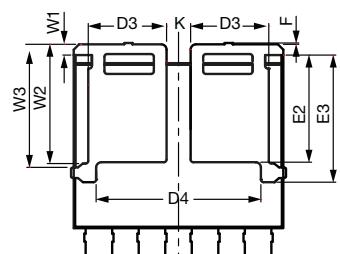
Bottom view (single)



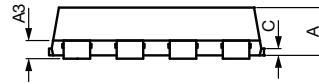
0.25 gauge line



Top view (dual)



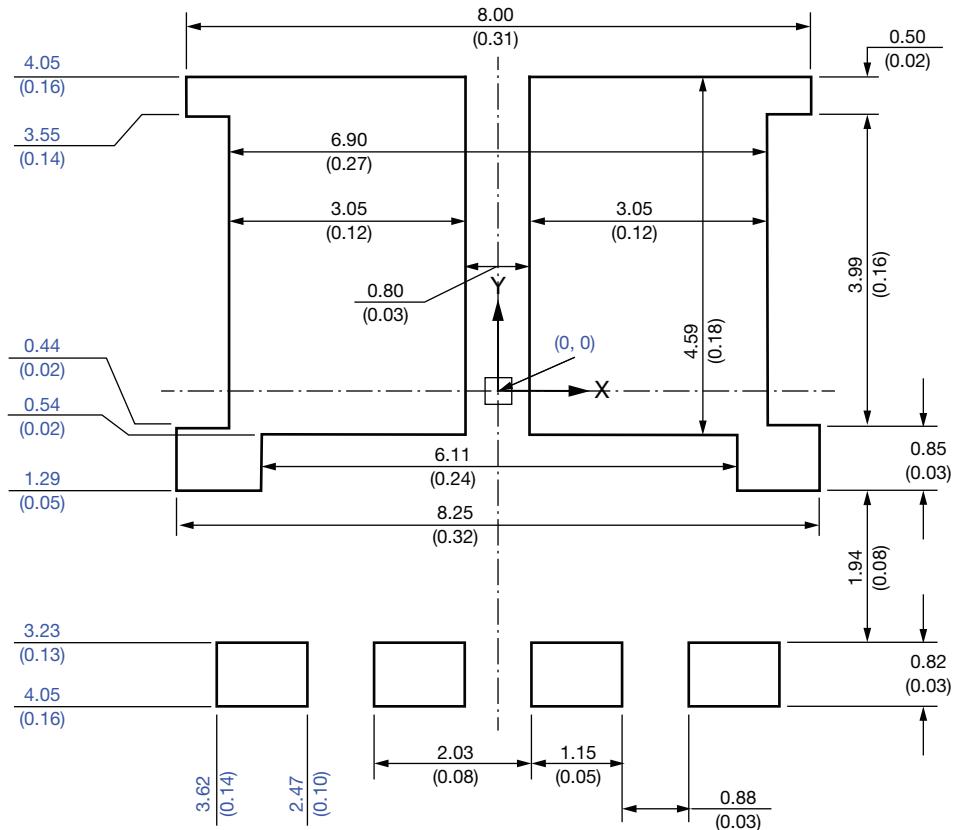
Bottom view (dual)



DIM.	MILLIMETERS			INCHES		
	MIN.	NOM.	MAX.	MIN.	NOM.	MAX.
A	1.70	1.80	1.90	0.067	0.071	0.075
A1	0.00	0.08	0.13	0.000	0.003	0.005
A3	0.55	0.62	0.70	0.022	0.024	0.028
b	0.92	1.00	1.08	0.036	0.039	0.043
b1	1.02	1.10	1.18	0.040	0.043	0.046
b2	7.80	7.90	8.00	0.307	0.311	0.315
c	0.20	0.25	0.30	0.008	0.010	0.012
D	8.00	8.10	8.25	0.315	0.319	0.325
D1	7.80	7.90	8.00	0.307	0.311	0.315
D2	6.70	6.80	6.90	0.264	0.268	0.272
D3	2.85	2.95	3.05	0.112	0.116	0.120
D4	6.11	6.21	6.31	0.241	0.244	0.248
e	1.95	2.00	2.05	0.077	0.079	0.081
E	7.90	8.00	8.10	0.311	0.315	0.319
E1	6.12	6.22	6.32	0.241	0.245	0.249
E2	3.94	4.04	4.14	0.140	0.159	0.163
E3	4.69	4.79	4.89	0.185	0.189	0.193
F	0.05	0.10	0.15	0.002	0.004	0.006
L	0.62	0.72	0.82	0.024	0.028	0.032
L1	0.92	1.07	1.22	0.036	0.042	0.048
K	0.80	0.90	1.00	0.031	0.035	0.039
W	0.30	0.40	0.50	0.012	0.016	0.020
W1	0.30	0.40	0.50	0.012	0.016	0.020
W2	4.39	4.49	4.59	0.173	0.177	0.181
W3	4.54	4.64	4.74	0.179	0.183	0.187
$\theta$	6°	10°	14°	6°	10°	14°
$\theta_1$	0°	3°	8°	0°	3°	8°

C14-0891-Rev. A, 06-Oct-14  
DWG: 6026

## Recommended Minimum PADs for PowerPAK® 8 x 8L Dual


**Note**

- Linear dimensions are in black, the same information is provided in ordinate dimensions which are in blue.



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- Поставка сложных, дефицитных, либо снятых с производства позиций;
- Оперативные сроки поставки под заказ (от 5 рабочих дней);
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- Лицензия ФСБ на осуществление работ с использованием сведений, составляющих государственную тайну;
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- Подбор аналогов;
- Консультации по применению компонента;
- Поставка образцов и прототипов;
- Техническая поддержка проекта;
- Защита от снятия компонента с производства.



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