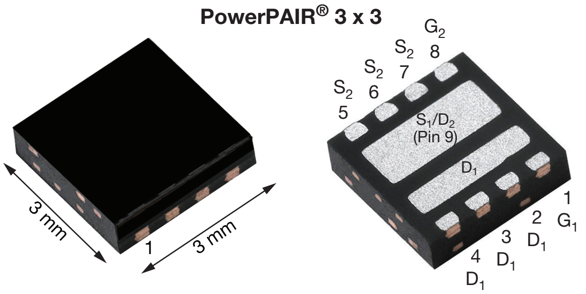
Dual N-Channel 30 V (D-S) MOSFET

PRODUCT SUMMARY				
	V_{DS} (V)	$R_{DS(on)}$ (Ω) MAX.	I_D (A)	Q_g (Typ.)
Channel-1 and Channel-2	30	0.0115 at V_{GS} = 10 V	30 [a]	4.5 nC
		0.0153 at V_{GS} = 4.5 V	27.5	

PowerPAIR® 3 x 3



Top View Bottom View

Ordering Information:
SiZ342DT-T1-GE3 (lead (Pb)-free and halogen-free)

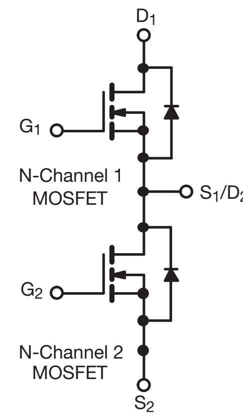
FEATURES

- PowerPAIR® optimizes high-side and low-side MOSFETs for synchronous buck converters
- TrenchFET® Gen IV power MOSFETs
- 100 % R_g and UIS tested
- Material categorization: for definitions of compliance please see www.vishay.com/doc?99912

RoHS COMPLIANT
HALOGEN FREE

APPLICATIONS

- Synchronous buck
  - Battery charging
  - Computer system power
  - Graphic cards
- POL



ABSOLUTE MAXIMUM RATINGS (T_A = 25 °C, unless otherwise noted)				
PARAMETER		CHANNEL-1 AND CHANNEL-2		
		SYMBOL	LIMIT	UNIT
Drain-Source Voltage		V_{DS}	30	V
Gate-Source Voltage		V_{GS}	+20 / -16	
Continuous Drain Current (T_J = 150 °C)	T_C = 25 °C	I_D	30 [a]	A
	T_C = 70 °C		26.5	
	T_A = 25 °C		15.6 [b, c]	
	T_A = 70 °C		12.4 [b, c]	
Pulsed Drain Current (t = 100 μs)		I_{DM}	100	
Continuous Source Drain Diode Current	T_C = 25 °C	I_S	13.9	
	T_A = 25 °C		3.1 [b, c]	
Avalanche Current	L = 0.1 mH	I_{AS}	10	
Single Pulse Avalanche Energy		E_{AS}	5	mJ
Maximum Power Dissipation	T_C = 25 °C	P_D	16.7	W
	T_C = 70 °C		10.7	
	T_A = 25 °C		3.7 [b, c]	
	T_A = 70 °C		2.4 [b, c]	
Operating Junction and Storage Temperature Range		T_J, T_{stg}	-55 to 150	°C
Soldering Recommendations (Peak Temperature) [d, e]			260	

Notes

a. Package limited.
b. Surface mounted on 1" x 1" FR4 board.
c. t = 10 s.
d. See solder profile (www.vishay.com/doc?73257). The PowerPAIR 3 x 3 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.
e. Rework conditions: manual soldering with a soldering iron is not recommended for leadless components.

THERMAL RESISTANCE RATINGS					
PARAMETER		CHANNEL-1 AND CHANNEL-2			
		SYMBOL	TYP.	MAX.	UNIT
Maximum Junction-to-Ambient [a, b]	$t \leq 10$ s	R_{thJA}	27	34	°C/W
Maximum Junction-to-Case (Drain)	Steady State	R_{thJC}	6	7.5	

Notes

a. Surface mounted on 1" x 1" FR4 board.

b. Maximum under steady state conditions is 69 °C/W.

SPECIFICATIONS (T_J = 25 °C, unless otherwise noted)						
PARAMETER	CHANNEL-1 AND CHANNEL-2					
	SYMBOL	TEST CONDITIONS	MIN.	TYP.	MAX.	UNIT
Static						
Drain-Source Breakdown Voltage	V_{DS}	V_{GS} = 0 V, I_D = 250 µA	30	-	-	V
V_{DS} Temperature Coefficient	$\Delta V_{DS}/T_J$	I_D = 250 µA	-	20	-	mV/°C
$V_{GS(th)}$ Temperature Coefficient	$\Delta V_{GS(th)}/T_J$	I_D = 250 µA	-	-5.6	-	
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS} = V_{GS}$, I_D = 250 µA	1.2	-	2.4	V
Gate Source Leakage	I_{GSS}	V_{DS} =0 V, V_{GS} = +20 V/ -16 V	-	-	± 100	nA
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS} = 30 V, V_{GS} = 0 V	-	-	1	µA
		V_{DS} = 30 V, V_{GS} = 0 V, T_J = 55 °C	-	-	5	
On-State Drain Current [b]	$I_{D(on)}$	$V_{DS} \leq 5$ V, V_{GS} = 10 V	10	-	-	A
Drain-Source On-State Resistance [b]	$R_{DS(on)}$	V_{GS} = 10 V, I_D = 14.4 A	-	0.0084	0.0115	Ω
		V_{GS} = 4.5 V, I_D = 13 A	-	0.0111	0.0153	
Forward Transconductance [b]	g_{fs}	V_{DS} = 15 V, I_D = 14.4 A	-	37	-	S
Dynamic [a]						
Input Capacitance	C_{iss}	V_{DS} = 15 V, V_{GS} = 0 V, f = 1 MHz	-	650	-	pF
Output Capacitance	C_{oss}		-	236	-	
Reverse Transfer Capacitance	C_{rss}		-	20	-	
C_{rss} / C_{iss} Ratio			0.03	-	0.06	-
Total Gate Charge	Q_g	V_{DS} = 15 V, V_{GS} = 10 V, I_D = 14.4 A	-	10	20	nC
		V_{DS} = 15 V, V_{GS} = 4.5 V, I_D = 14.4 A	-	4.5	9	
Gate-Source Charge	Q_{gs}		-	2.1	-	
Gate-Drain Charge	Q_{gd}		-	0.7	-	
Output Charge	Q_{oss}		-	6.6	-	
Gate Resistance	R_g	f = 1 MHz	0.3	1.4	2.8	Ω
Turn-On Delay Time	$t_{d(on)}$	V_{DD} = 15 V, R_L = 1.5 Ω $I_D \cong$ 10 A, V_{GEN} = 4.5 V, R_g = 1 Ω	-	15	23	ns
Rise Time	t_r		-	50	75	
Turn-Off Delay Time	$t_{d(off)}$		-	16	24	
Fall Time	t_f		-	10	20	
Turn-On Delay Time	$t_{d(on)}$	V_{DD} = 15 V, R_L = 1.5 Ω $I_D \cong$ 10 A, V_{GEN} = 10 V, R_g = 1 Ω	-	8	16	
Rise Time	t_r		-	15	23	
Turn-Off Delay Time	$t_{d(off)}$		-	17	26	
Fall Time	t_f		-	7	14	

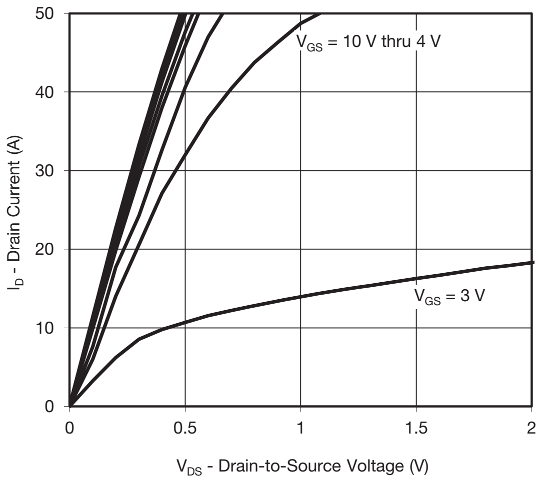
SPECIFICATIONS (T_J = 25 °C, unless otherwise noted)						
PARAMETER	**CHANNEL-1 AND CHANNEL-2**					
	SYMBOL	**TEST CONDITIONS**	**MIN.**	**TYP.**	**MAX.**	**UNIT**
Drain-Source Body Diode Characteristics						
Continuous Source-Drain Diode Current	I_S	T_C = 25 °C	-	-	13.9	A
Pulse Diode Forward Current (t = 100 µs)	I_{SM}		-	-	100	A
Body Diode Voltage	V_{SD}	I_S = 10 A, V_{GS} = 0 V	-	0.8	1.2	V
Body Diode Reverse Recovery Time	t_{rr}	I_F = 10 A, dI/dt = 100 A/µs, T_J = 25 °C	-	20	35	ns
Body Diode Reverse Recovery Charge	Q_{rr}		-	10	20	nC
Reverse Recovery Fall Time	t_a		-	12.5	-	ns
Reverse Recovery Rise Time	t_b		-	7.5	-	ns

Notes

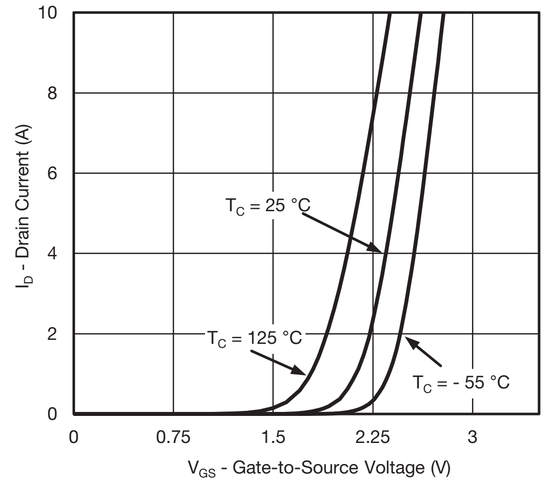
a. Guaranteed by design, not subject to production testing.
b. Pulse test; pulse width ≤ 300 µs, duty cycle ≤ 2 %.

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.

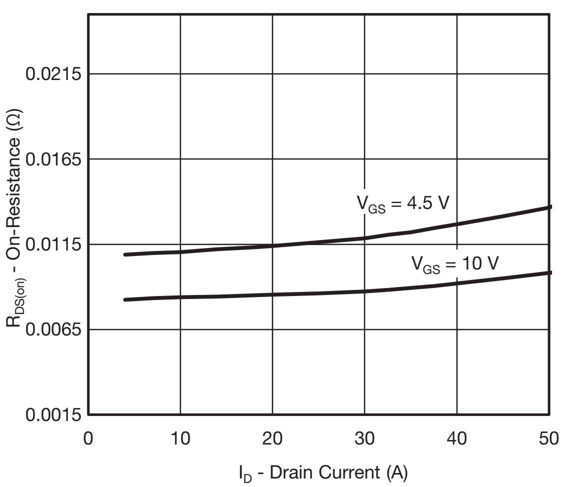
CHANNEL-1 AND CHANNEL-2 TYPICAL CHARACTERISTICS (25 °C, unless otherwise noted)



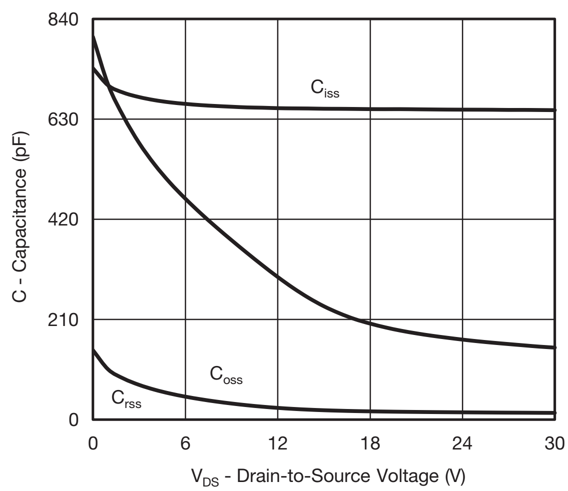
Output Characteristics



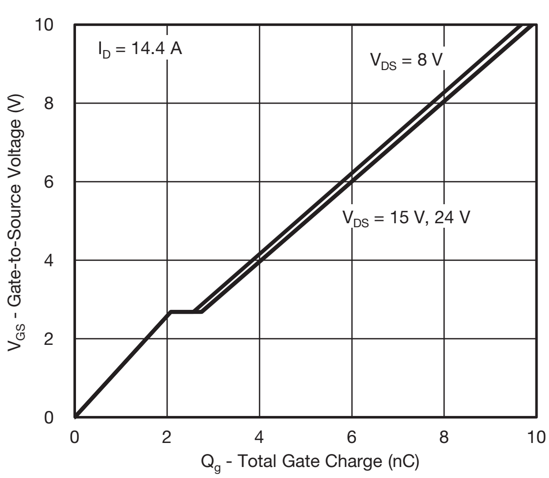
Transfer Characteristics



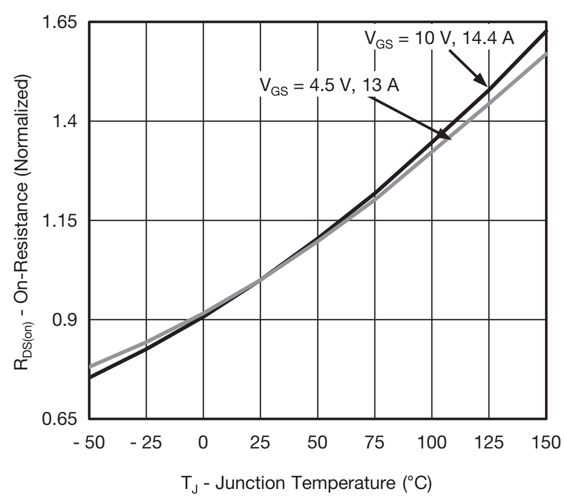
On-Resistance vs. Drain Current



Capacitance

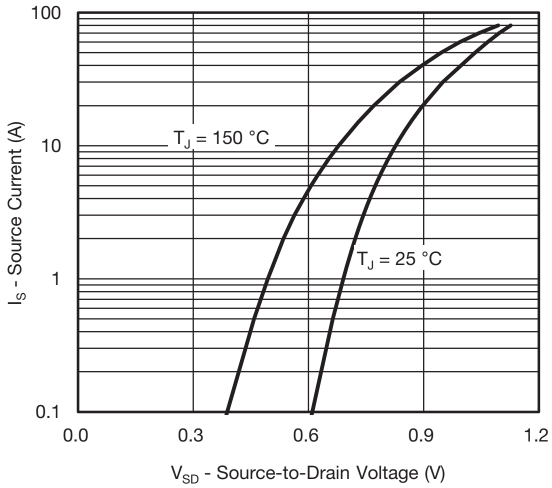


Gate Charge

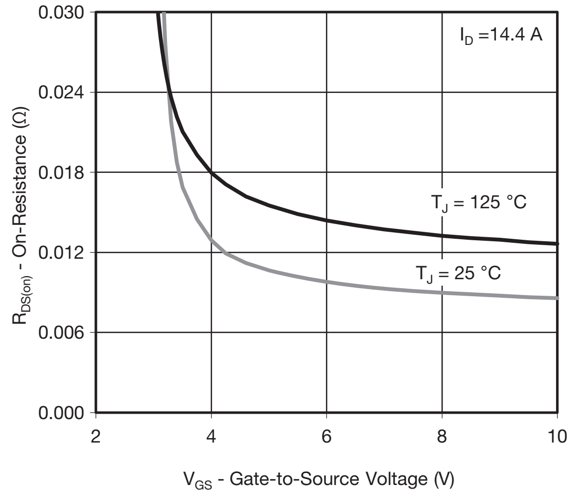


On-Resistance vs. Junction Temperature

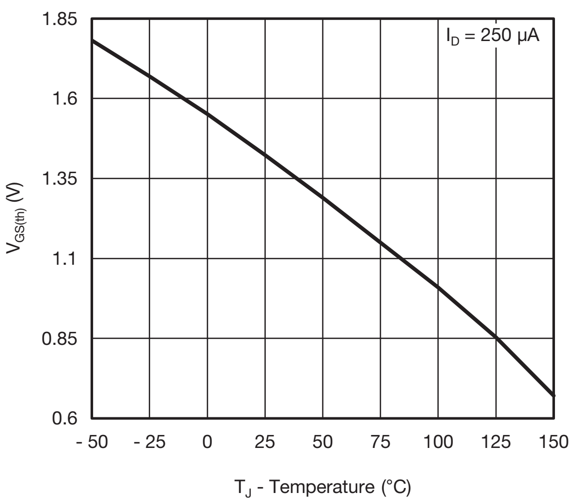
CHANNEL-1 AND CHANNEL-2 TYPICAL CHARACTERISTICS (25 °C, unless otherwise noted)



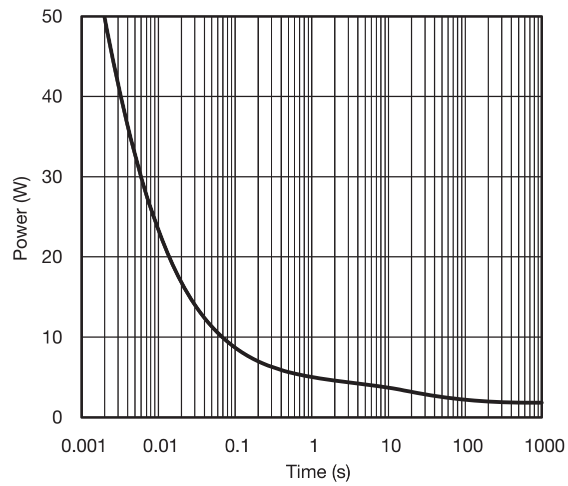
Source-Drain Diode Forward Voltage



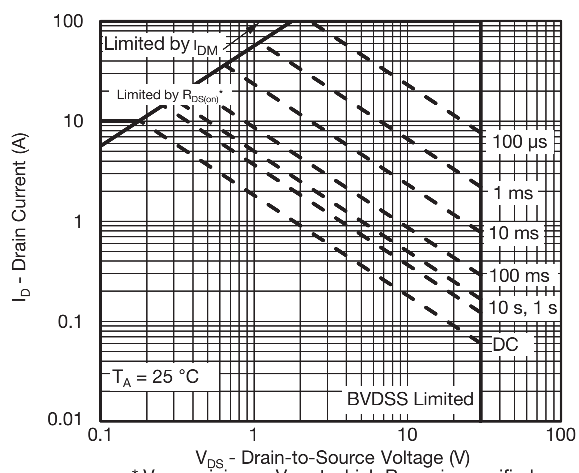
On-Resistance vs. Gate-to-Source Voltage



Threshold Voltage



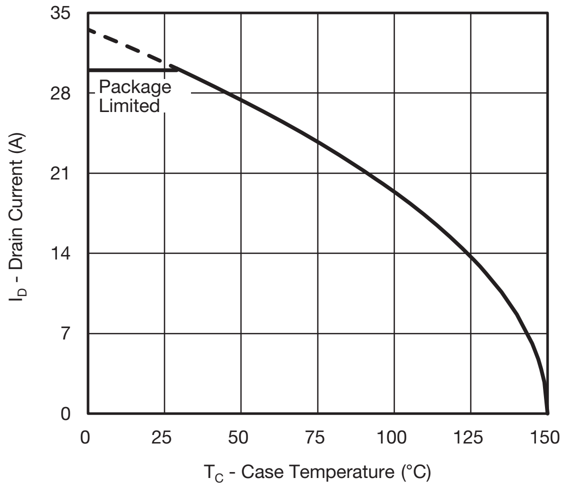
Single Pulse Power (Junction-to-Ambient)



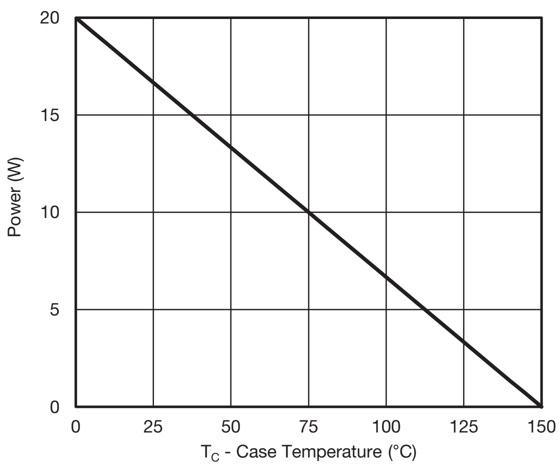
* V_{GS} > minimum V_{GS} at which $R_{DS(on)}$ is specified

Safe Operating Area, Junction-to-Ambient

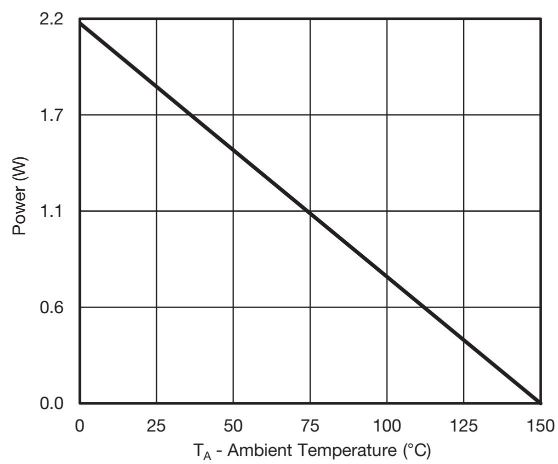
CHANNEL-1 AND CHANNEL-2 TYPICAL CHARACTERISTICS (25 °C, unless otherwise noted)



Current Derating*



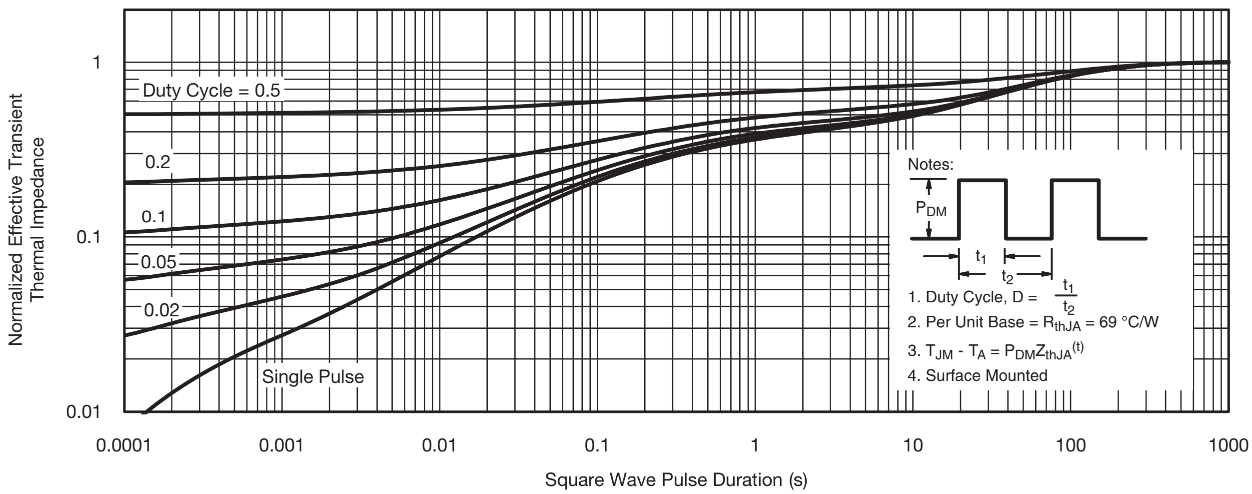
Power, Junction-to-Case



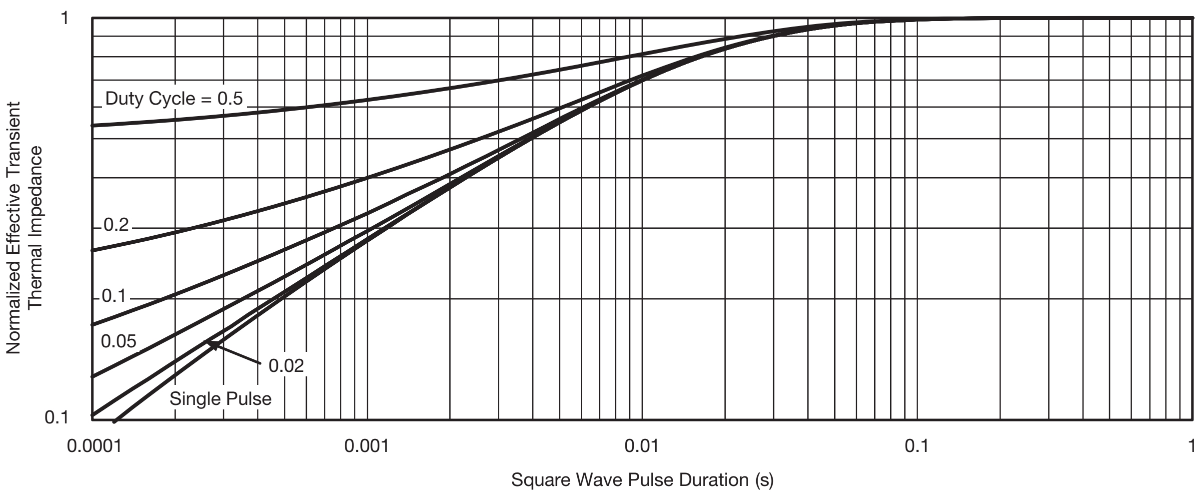
Power, Junction-to-Ambient

* The power dissipation P_D is based on $T_{J\ (max.)}$ = 150 °C, using junction-to-case thermal resistance, and is more useful in settling the upper dissipation limit for cases where additional heatsinking is used. It is used to determine the current rating, when this rating falls below the package limit.

CHANNEL-1 AND CHANNEL-2 TYPICAL CHARACTERISTICS (25 °C, unless otherwise noted)



Normalized Thermal Transient Impedance, Junction-to-Ambient



Normalized Thermal Transient Impedance, Junction-to-Case

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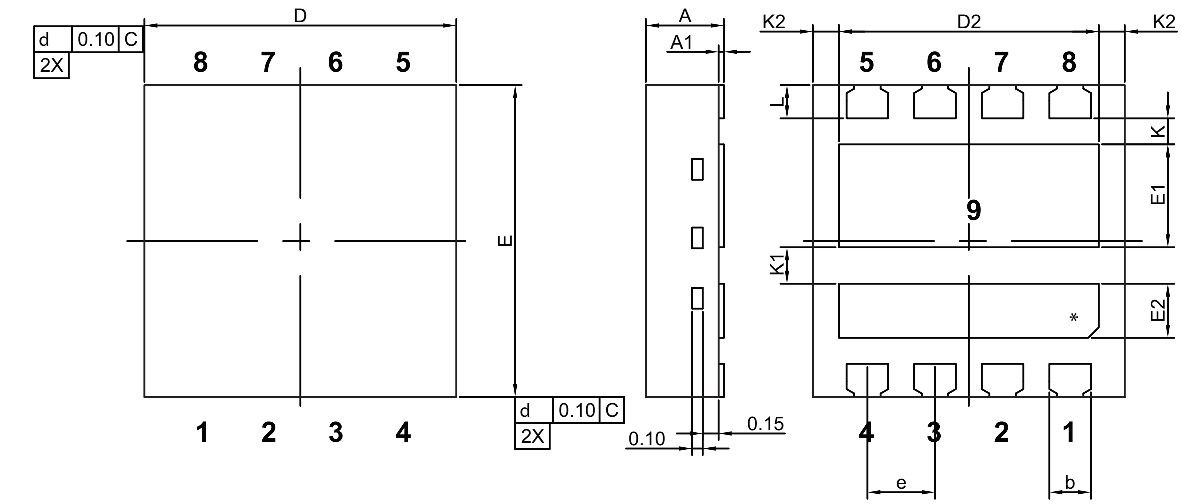
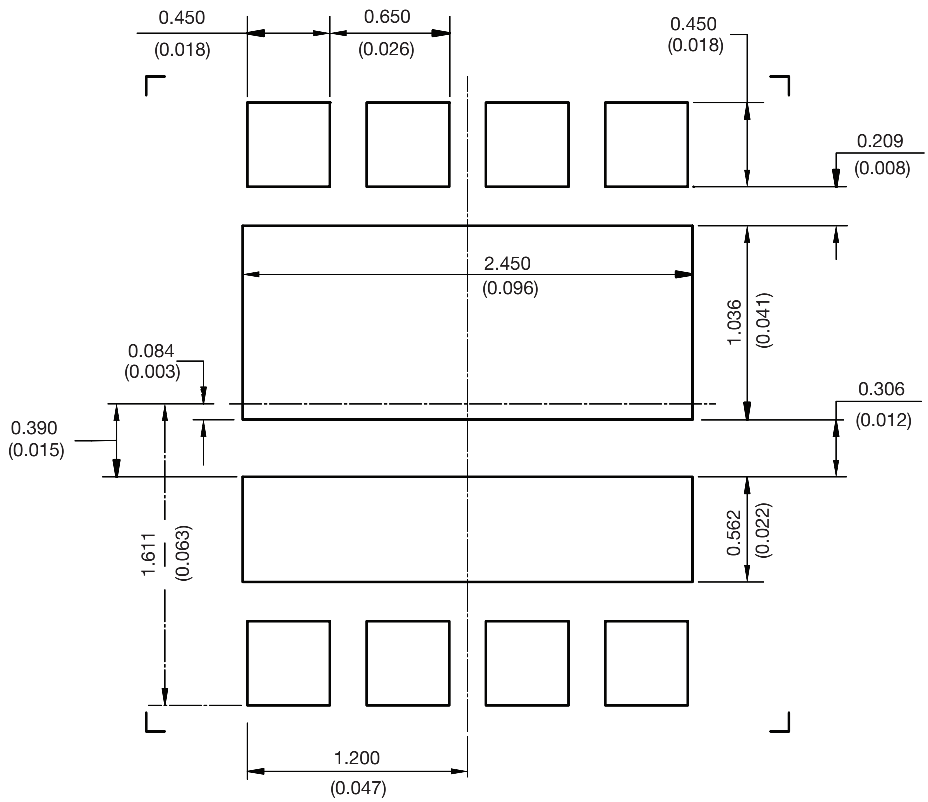
PowerPAIR® 3 x 3 Case Outline



Note
* Indicates pin #1 orientation (optional)

DIM.	MILLIMETERS			INCHES		
	MIN.	NOM.	MAX.	MIN.	NOM.	MAX.
A	0.70	0.75	0.80	0.028	0.030	0.031
A1	0.00		0.05	0.000		0.002
b	0.35	0.40	0.45	0.014	0.016	0.018
b1	0.20	0.25	0.38	0.008	0.010	0.015
C	0.18	0.20	0.23	0.007	0.008	0.009
D	2.90	3.00	3.10	0.114	0.118	0.122
D2	2.35	2.40	2.45	0.093	0.094	0.096
E	2.90	3.00	3.10	0.114	0.118	0.122
E1	0.94	0.99	1.04	0.037	0.039	0.041
E2	0.47	0.52	0.57	0.019	0.020	0.022
e	0.65 BSC			0.026 BSC		
K	0.25 typ.			0.010 typ.		
K1	0.35 typ.			0.014 typ.		
K2	0.30 typ.			0.012 typ.		
L	0.27	0.32	0.37	0.011	0.013	0.015
ECN: T12-0347-Rev. C, 18-Jun-12 DWG: 5998						

RECOMMENDED MINIMUM PAD FOR PowerPAIR® 3 x 3



Recommended PAD for PowerPAIR 3 x 3

Dimensions in millimeters (inches)

Keep-Out 3.5 mm x 3.5 mm for non terminating traces

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- Поставка более 17-ти миллионов наименований электронных компонентов;
- Поставка сложных, дефицитных, либо снятых с производства позиций;
- Оперативные сроки поставки под заказ (от 5 рабочих дней);
- Экспресс доставка в любую точку России;
- Техническая поддержка проекта, помощь в подборе аналогов, поставка прототипов;
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- Подбор оптимального решения, техническое обоснование при выборе компонента;
- Подбор аналогов;
- Консультации по применению компонента;
- Поставка образцов и прототипов;
- Техническая поддержка проекта;
- Защита от снятия компонента с производства.

Как с нами связаться

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