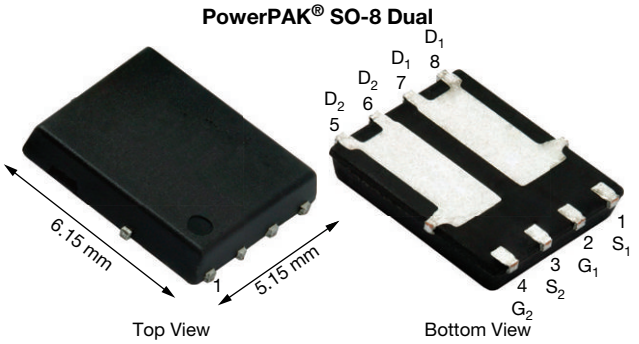
Dual N-Channel 100 V (D-S) MOSFET

PowerPAK® SO-8 Dual



Top View Bottom View

FEATURES

- TrenchFET® power MOSFET
- PWM optimized
- 100 % R_g and UIS tested
- Material categorization: for definitions of compliance please see www.vishay.com/doc?99912

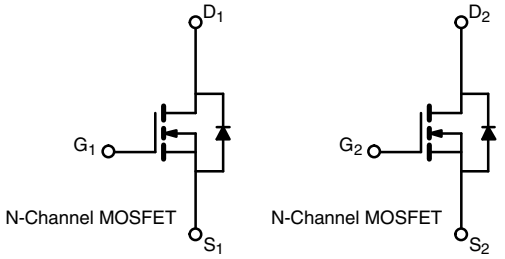
Pb-free

RoHS COMPLIANT

HALOGEN FREE

APPLICATIONS

- System power DC/DC



PRODUCT SUMMARY	
V_{DS} (V)	100
$R_{DS(on)}$ max. (Ω) at V_{GS} = 10 V	0.0186
$R_{DS(on)}$ max. (Ω) at V_{GS} = 7.5 V	0.0225
Q_g typ. (nC)	13.1
I_D (A)	28.7 [a]
Configuration	Dual

ORDERING INFORMATION	
Package	PowerPAK SO-8
Lead (Pb)-free and halogen-free	Si7252ADP-T1-GE3

ABSOLUTE MAXIMUM RATINGS (T_A = 25 °C, unless otherwise noted)

PARAMETER		SYMBOL	LIMIT	UNIT
Drain-source voltage		V_{DS}	100	V
Gate-source voltage		V_{GS}	± 20	
Continuous drain current (T_J = 150 °C)	T_C = 25 °C	I_D	28.7 [a]	A
	T_C = 70 °C		23 [a]	
	T_A = 25 °C		9.3 [a]	
	T_A = 70 °C		7.4 [a]	
Pulsed drain current (V_{GS} = 10 V, t = 100 µs)		I_{DM}	70	
Source-drain current diode current	T_C = 25 °C	I_S	30.7	
	T_A = 25 °C		3.3 [b, c]	
Single pulse avalanche current	L = 0.1 mH	I_{AS}	10	
		E_{AS}	5	mJ
Maximum power dissipation	T_C = 25 °C	P_D	33.8	W
	T_C = 70 °C		21.6	
	T_A = 25 °C		3.6 [b, c]	
	T_A = 70 °C		2.3 [b, c]	
Operating junction and storage temperature range		T_J, T_{stg}	-55 to +150	°C
Soldering recommendations (peak temperature) [d, e]			260	

THERMAL RESISTANCE RATINGS

PARAMETER		SYMBOL	TYP.	MAX.	UNIT
Maximum junction-to-ambient [b, f]	t ≤ 10 s	R_{thJA}	28	35	°C/W
Maximum junction-to-case (drain)	Steady state	R_{thJC}	3	3.7	

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 PowerPAK SO-8 is a leadless package. The end of the lead terminal is exposed copper

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(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
f. Maximum under steady state conditions is 85 °C/W

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SPECIFICATIONS (T_J = 25 °C, unless otherwise noted)						
PARAMETER	**SYMBOL**	**TEST CONDITIONS**	**MIN.**	**TYP.**	**MAX.**	**UNIT**
Static						
Drain-source breakdown voltage	V_{DS}	V_{GS} = 0 V, I_D = 250 µA	100	-	-	V
V_{DS} temperature coefficient	$\Delta V_{DS}/T_J$	I_D = 10 mA	-	81	-	mV/°C
$V_{GS(th)}$ temperature coefficient	$\Delta V_{GS(th)}/T_J$	I_D = 250 µA	-	-7.4	-	
Gate threshold voltage	$V_{GS(th)}$	V_{DS} = V_{GS}, I_D = 250 µA	2	-	4	V
Gate-body leakage	I_{GSS}	V_{DS} = 0 V, V_{GS} = ± 20 V	-	-	100	nA
Zero gate voltage drain current	I_{DSS}	V_{DS} = 100 V, V_{GS} = 0 V	-	-	1	µA
		V_{DS} = 100 V, V_{GS} = 0 V, T_J = 85 °C	-	-	10	
On-state drain current [b]	$I_{D(on)}$	$V_{DS} \geq$ 5 V, V_{GS} = 10 V	40	-	-	A
Drain-source on-state resistance [b]	$R_{DS(on)}$	V_{GS} = 10 V, I_D = 10 A	-	0.0155	0.0186	Ω
		V_{GS} = 7.5 V, I_D = 10 A	-	0.0175	0.0225	
Forward transconductance [b]	g_{fs}	V_{DS} = 15 V, I_D = 10 A	-	22	-	S
Dynamic [a]						
Input capacitance	C_{iss}	V_{DS} = 50 V, V_{GS} = 0 V, f = 1 MHz	-	1266	-	pF
Output capacitance	C_{oss}		-	123	-	
Reverse transfer capacitance	C_{rss}		-	6	-	
Total gate charge	Q_g	V_{DS} = 50 V, V_{GS} = 10 V, I_D = 10 A	-	17.4	26.5	nC
		V_{DS} = 50 V, V_{GS} = 7.5 V, I_D = 10 A	-	13.1	20	
Gate-source charge	Q_{gs}		-	7.1	-	
Gate-drain charge	Q_{gd}		-	2.3	-	
Gate resistance	R_g	f = 1 MHz	0.2	0.75	1.3	Ω
Turn-on delay time	$t_{d(on)}$	V_{DD} = 50 V, R_L = 5 Ω $I_D \cong$ 10 A, V_{GEN} = 7.5 V, R_g = 1 Ω	-	12	24	ns
Rise time	t_r		-	6	12	
Turn-off delay time	$t_{d(off)}$		-	15	30	
Fall time	t_f		-	5	10	
Turn-on delay time	$t_{d(on)}$	V_{DD} = 50 V, R_L = 5 Ω $I_D \cong$ 10 A, V_{GEN} = 10 V, R_g = 1 Ω	-	11	22	
Rise time	t_r		-	5	10	
Turn-off delay time	$t_{d(off)}$		-	16	32	
Fall time	t_f		-	5	10	
Drain-Source Body Diode Characteristics						
Continuous source-drain diode Current	I_S	T_C = 25 °C	-	-	30.7	A
Pulse diode forward current [a]	I_{SM}		-	-	70	
Body diode voltage	V_{SD}	I_S = 5 A	-	0.78	1.1	V
Body diode reverse recovery time	t_{rr}	I_F = 5 A, di/dt = 100 A/µs, T_J = 25 °C	-	37	74	ns
Body diode reverse recovery charge	Q_{rr}		-	53	106	nC
Reverse recovery fall time	t_a		-	27	-	ns
Reverse recovery rise time	t_b		-	10	-	

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.

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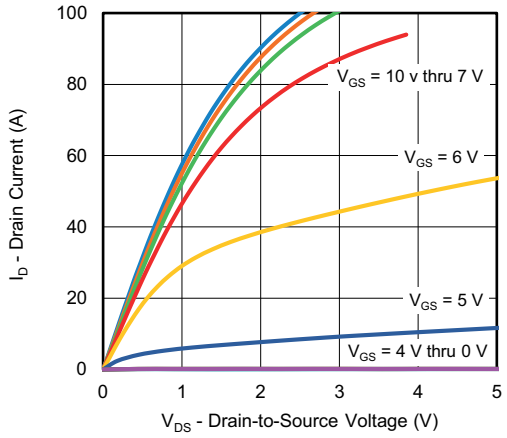
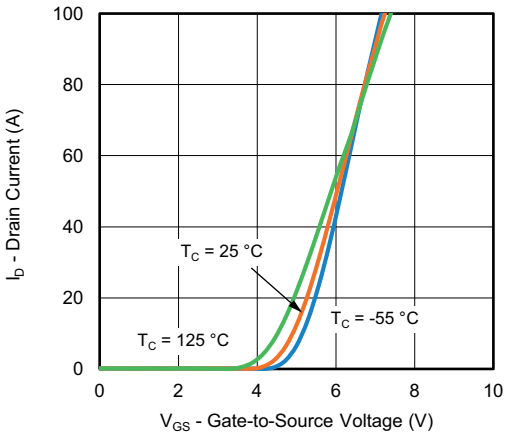
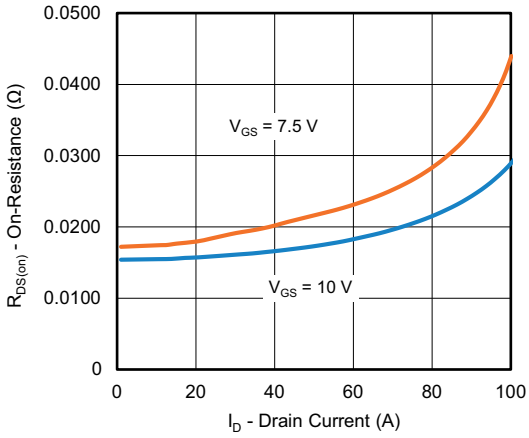


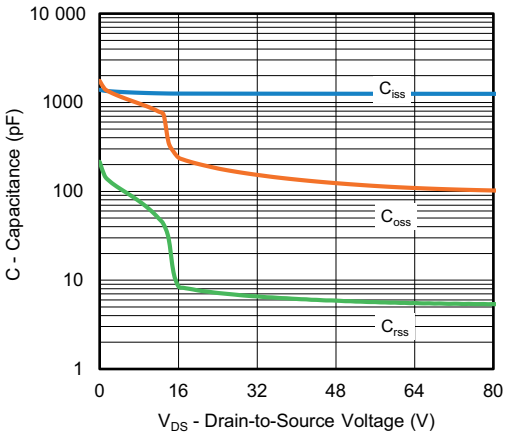
Output Characteristics



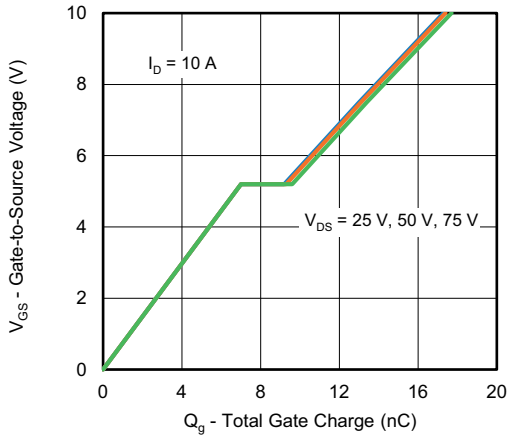
Transfer Characteristics



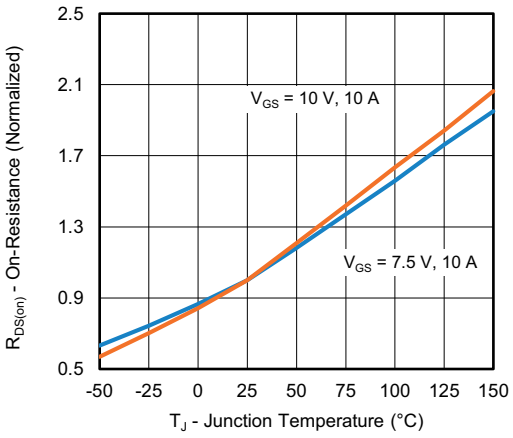
On-Resistance vs. Drain Current



Capacitance



Gate Charge



On-Resistance vs. Junction Temperature

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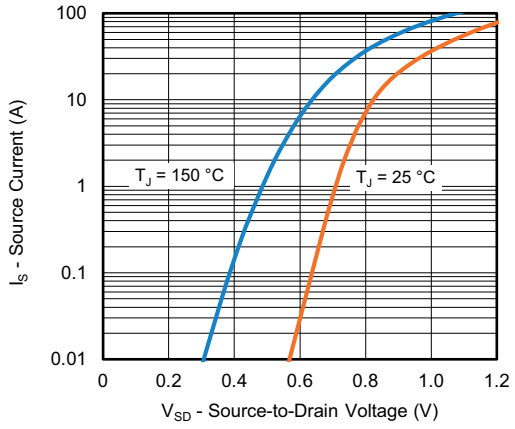
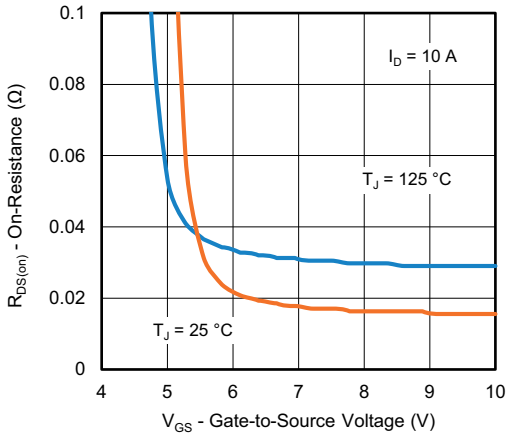
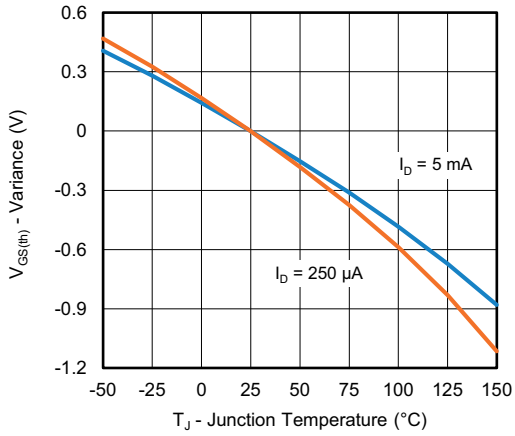


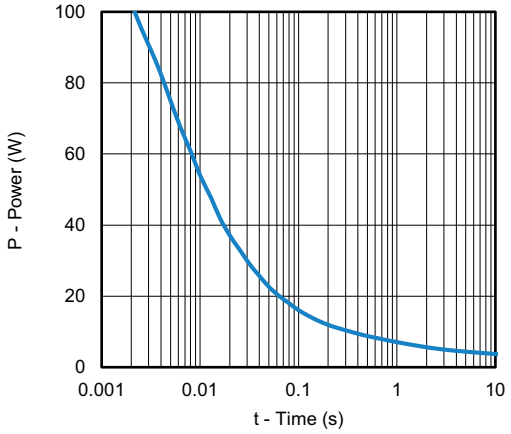
Source-Drain Diode Forward Voltage



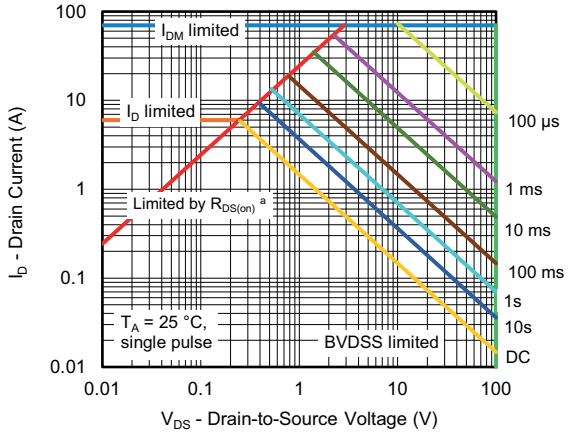
On-Resi.0stance vs. Gate-to-Source Voltage



Threshold Voltage



Single Pulse Power



Safe Operating Area, Junction-to-Ambient

Note

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

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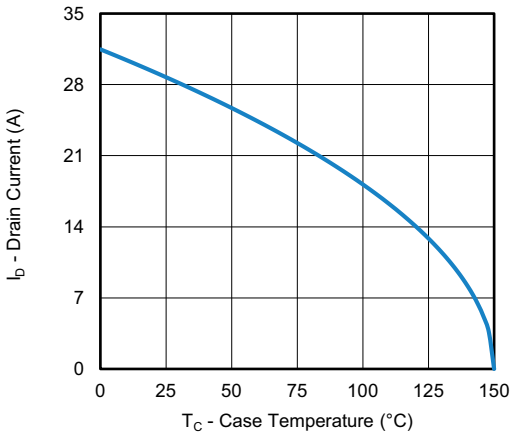
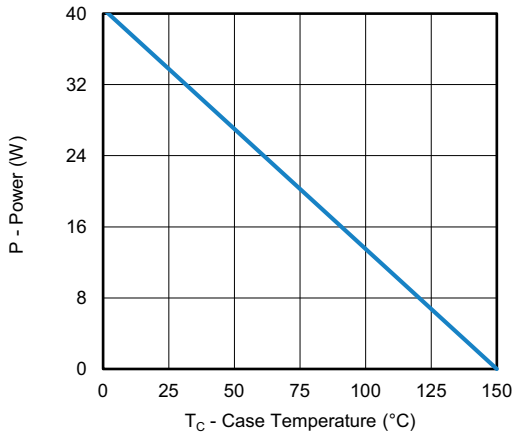
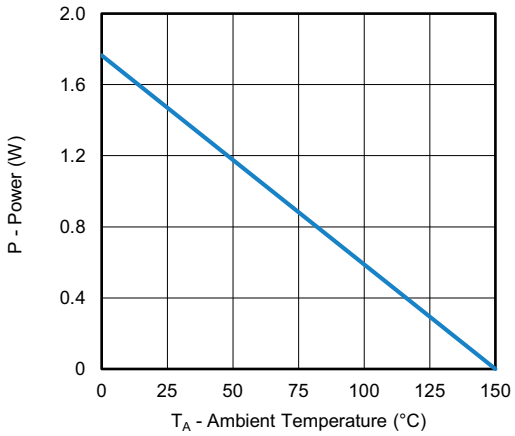


Current Derating [a]



Power, Junction-to-Case



Power, Junction-to-Ambient

Note

a. 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

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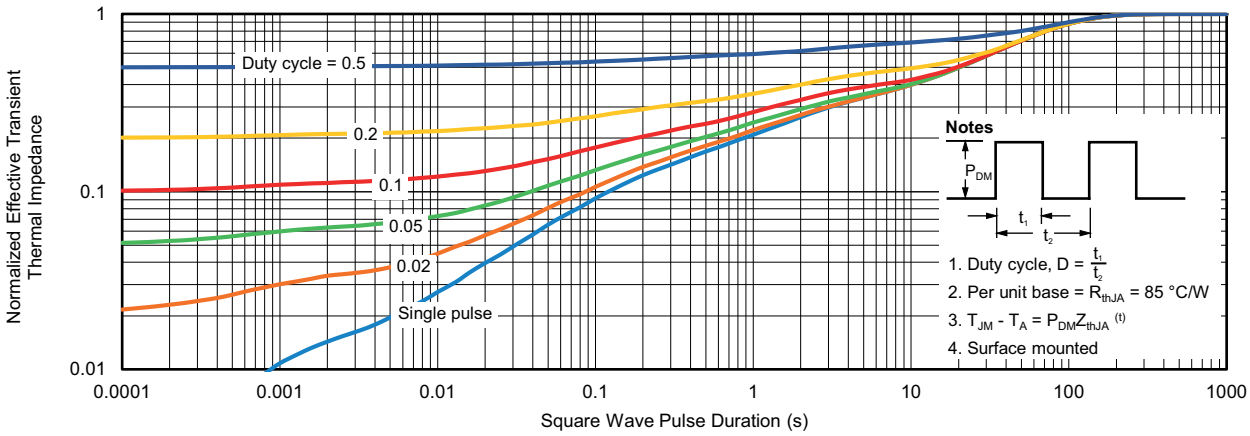
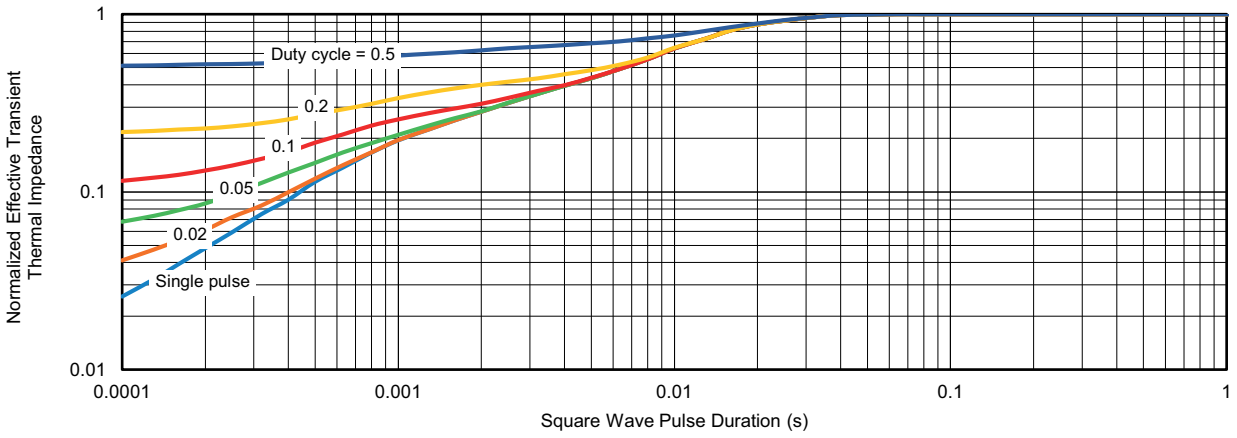


Normalized Thermal Transient Impedance, Junction-to-Ambient



Normalized Thermal Transient Impedance, Junction-to-Case

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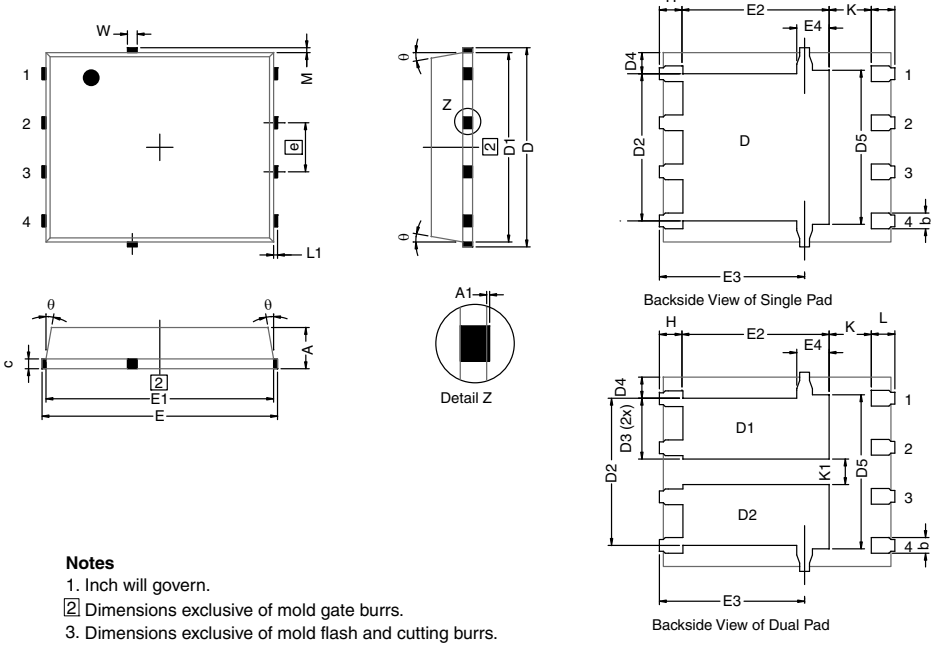
PowerPAK® SO-8, (Single/Dual)



Notes

1. Inch will govern.
2. Dimensions exclusive of mold gate burrs.
3. Dimensions exclusive of mold flash and cutting burrs.

DIM.	MILLIMETERS			INCHES		
	MIN.	NOM.	MAX.	MIN.	NOM.	MAX.
A	0.97	1.04	1.12	0.038	0.041	0.044
A1		-	0.05	0	-	0.002
b	0.33	0.41	0.51	0.013	0.016	0.020
c	0.23	0.28	0.33	0.009	0.011	0.013
D	5.05	5.15	5.26	0.199	0.203	0.207
D1	4.80	4.90	5.00	0.189	0.193	0.197
D2	3.56	3.76	3.91	0.140	0.148	0.154
D3	1.32	1.50	1.68	0.052	0.059	0.066
D4	0.57 typ.			0.0225 typ.		
D5	3.98 typ.			0.157 typ.		
E	6.05	6.15	6.25	0.238	0.242	0.246
E1	5.79	5.89	5.99	0.228	0.232	0.236
E2	3.48	3.66	3.84	0.137	0.144	0.151
E3	3.68	3.78	3.91	0.145	0.149	0.154
E4	0.75 typ.			0.030 typ.		
e	1.27 BSC			0.050 BSC		
K	1.27 typ.			0.050 typ.		
K1	0.56	-	-	0.022	-	-
H	0.51	0.61	0.71	0.020	0.024	0.028
L	0.51	0.61	0.71	0.020	0.024	0.028
L1	0.06	0.13	0.20	0.002	0.005	0.008
θ	0°	-	12°	0°	-	12°
W	0.15	0.25	0.36	0.006	0.010	0.014
M	0.125 typ.			0.005 typ.		
ECN: S17-0173-Rev. L, 13-Feb-17 DWG: 5881						

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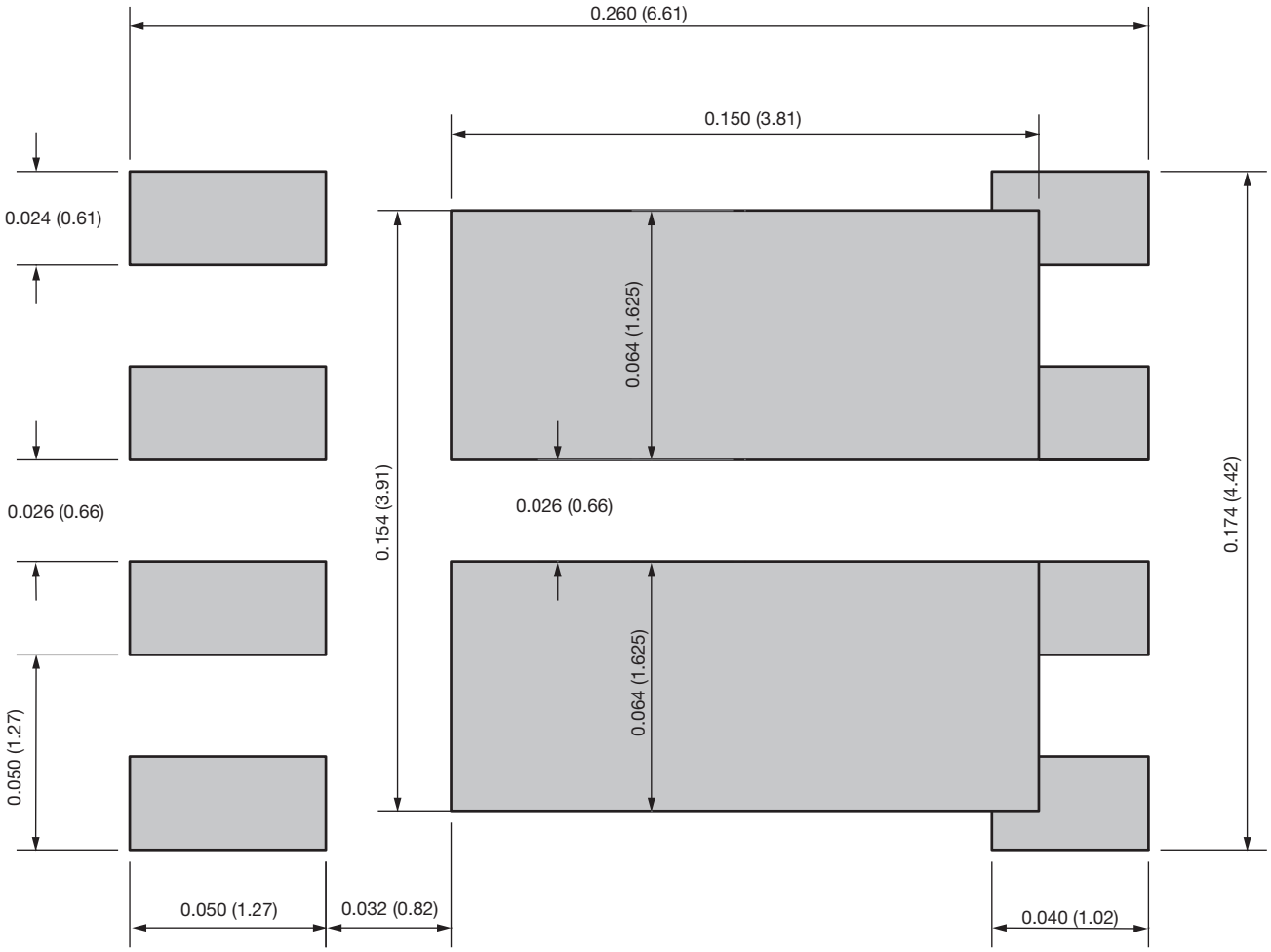
Recommended Land Pattern PowerPAK® SO-8 Dual



Note

- Dimensions in inches (millimeters)

ECN: S24-0458-Rev. A, 06-May-2024
DWG: 3026

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