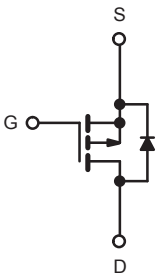
P-Channel MOSFET

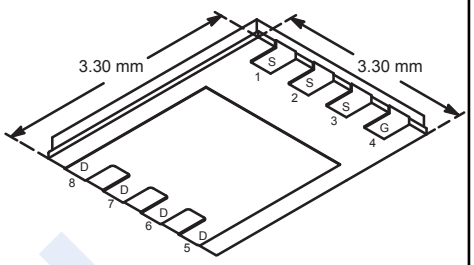
SI7129DN (KI7129DN)

■ Features

- $V_{DS\ (V)}$ =-30V
- I_D =-35 A (V_{GS} =-10V)
- $R_{DS(ON)}$ < 11.4mΩ (V_{GS} =-10V)
- $R_{DS(ON)}$ < 20mΩ (V_{GS} =-4.5V)



1212-8 (DFN)



Bottom View

■ Absolute Maximum Ratings Ta = 25℃

Parameter		Symbol	Rating	Unit
Drain-Source Voltage		V_{DS}	-30	V
Gate-Source Voltage		V_{GS}	±20	
Continuous Drain Current	Tc=25℃	I_D	-35	A
	Tc=70℃		-35	
	Ta=25℃ (Note.1 and 2)		-14.4	
	Ta=70℃ (Note.1 and 2)		-11.5	
Pulsed Drain Current		I_{DM}	-60	
Avalanche Current	L=0.1mH	I_{AS}	-25	
Single-Pulse Avalanche Energy		E_{AS}	31.25	mJ
Power Dissipation	Tc=25℃	P_D	52.1	W
	Tc=70℃		3.3	
	Ta=25℃ (Note.1 and 2)		3.8	
	Ta=70℃ (Note.1 and 2)		2.4	
Thermal Resistance.Junction- to-Ambient	t≤10s (Note.1 and 2)	R_{thJA}	33	℃/W
Thermal Resistance.Junction- to-Case	Steady State	R_{thJC}	2.4	
Junction Temperature		T_J	150	℃
Junction Storage Temperature Range		T_{stg}	-55 to 150	

Note.1: Surface mounted on 1" x 1" FR4 board.

Note.2: t = 10 s.

P-Channel MOSFET

SI7129DN (KI7129DN)

■ Electrical Characteristics Ta = 25℃

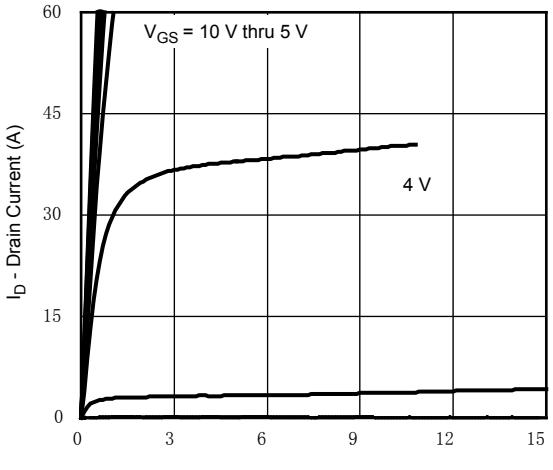
Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Drain-Source Breakdown Voltage	V_{DSS}	I_D=-250μA, V_{GS}=0V	-30			V
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS}=-30V, V_{GS}=0V			-1	μA
		V_{DS}=-30V, V_{GS}=0V, T_J=55℃			-10	
Gate-Body leakage current	I_{GSS}	V_{DS}=0V, V_{GS}=±20V			±100	nA
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS}=V_{GS} I_D=-250μA	-1.5		-2.8	V
Static Drain-Source On-Resistance (Note.1)	$R_{DS(ON)}$	V_{GS}=-10V, I_D=-14.4A		9.5	11.4	mΩ
		V_{GS}=-4.5V, I_D=-11.5A		16	20	
On state drain current (Note.1)	$I_{D(ON)}$	V_{GS}=-10V, V_{DS}=-5V	-20			A
Forward Transconductance (Note.1)	g_{FS}	V_{DS}=-15V, I_D=-14.4A		37		S
Input Capacitance	C_{iss}	V_{GS}=0V, V_{DS}=-15V, f=1MHz		2230	3345	pF
Output Capacitance	C_{oss}			385	578	
Reverse Transfer Capacitance	C_{rss}			322		
Gate resistance	R_g	V_{GS}=0V, V_{DS}=0V, f=1MHz	0.4	1.8	3.6	Ω
Total Gate Charge	Q_g	V_{GS}=-10V, V_{DS}=-15V, I_D=-14.4A		47.5	71	nC
		V_{GS}=-4.5V, V_{DS}=-15V, I_D=-14.4A		24.6	37	
Gate Source Charge	Q_{gs}			7.7		
Gate Drain Charge	Q_{gd}			12		
Turn-On DelayTime	$t_{d(on)}$	V_{GS}=-4.5V, V_{DS}=-15V, R_L=1.5Ω, R_G=1Ω, I_D=-10A		50	75	ns
Turn-On Rise Time	t_r			43	65	
Turn-Off DelayTime	$t_{d(off)}$			30	45	
Turn-Off Fall Time	t_f			14	21	
Turn-On DelayTime	$t_{d(on)}$	V_{GS}=-10V, V_{DS}=-15V, R_L=1.5Ω, R_G=1Ω, I_D=-10A		14	21	
Turn-On Rise Time	t_r			9	18	
Turn-Off DelayTime	$t_{d(off)}$			36	54	
Turn-Off Fall Time	t_f			10	20	
Body Diode Reverse Recovery Time	t_{rr}	I_F=-10A, dI/dt=100A/μs, T_J=25℃		34	47	
Body Diode Reverse Recovery Charge	Q_{rr}			30	45	nC
Reverse Recovery Fall Time	t_a			15		ns
Reverse Recovery Rise Time	t_b			16		
Maximum Body-Diode Continuous Current	I_S	Tc=25℃			-35	A
Pulse Diode Forward Currenta (Note.1)	I_{SM}				-60	
Diode Forward Voltage	V_{SD}	I_F=-10A		-0.8	-1.2	V

Note.1: Pulse test; pulse width ≤ 300 μs, duty cycle ≤ 2 %.

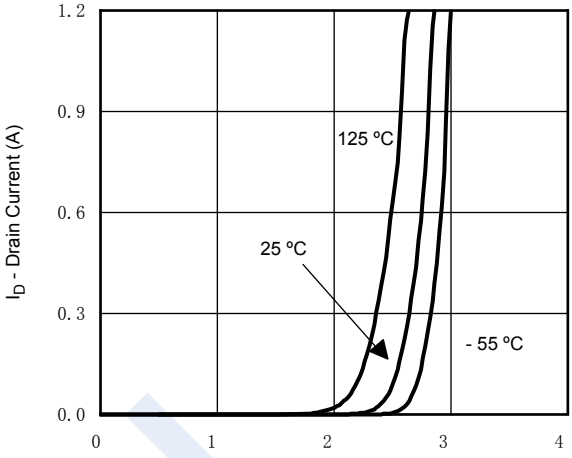
P-Channel MOSFET

SI7129DN (KI7129DN)

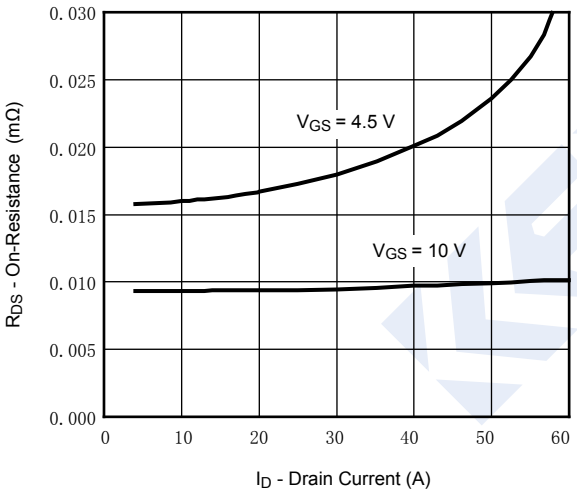
■ Typical Characterisitics



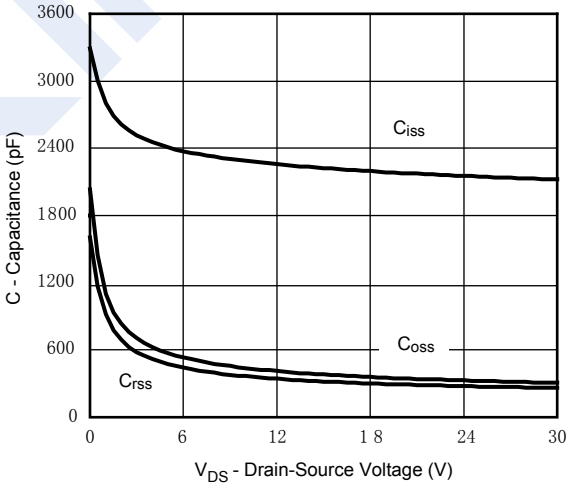
Output Characteristics



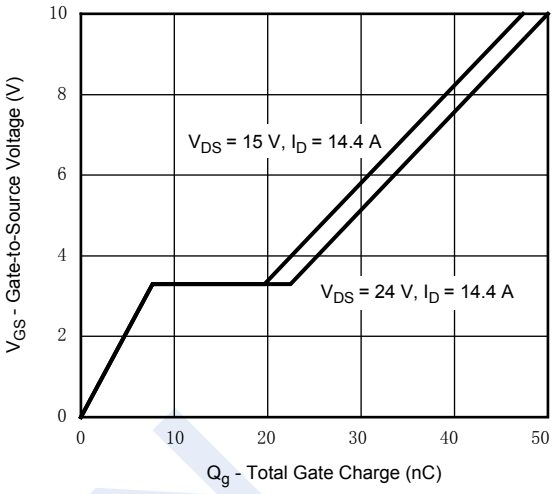
Transfer Characteristics



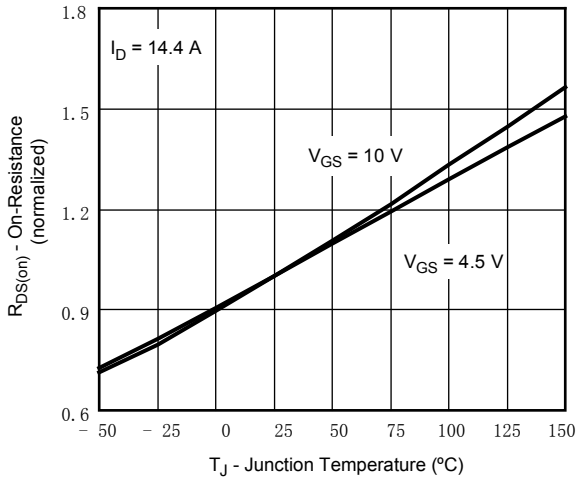
On-Resistance vs. Drain Current and Gate Voltage



Capacitance



Gate Charge

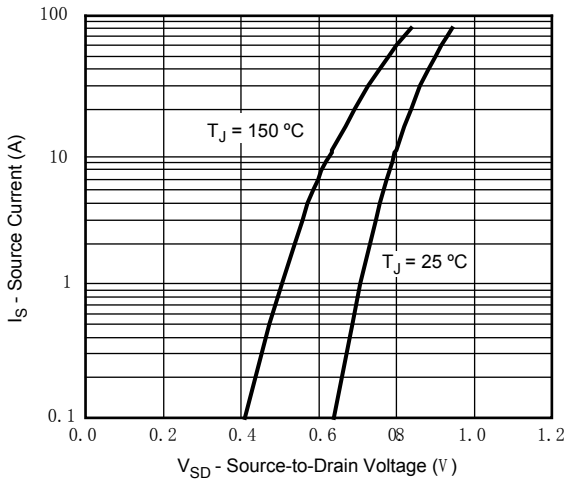


On-Resistance vs. Junction Temperature

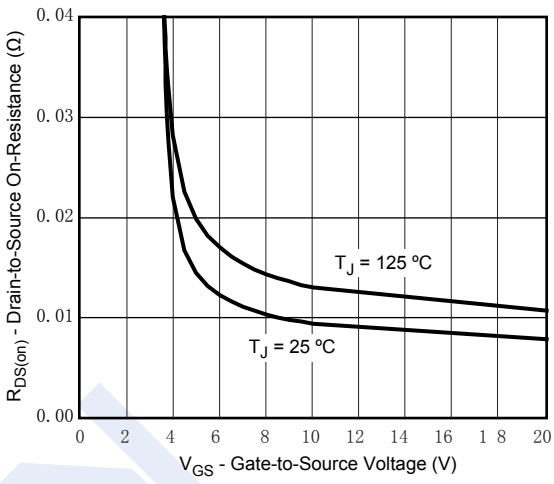
P-Channel MOSFET

SI7129DN (KI7129DN)

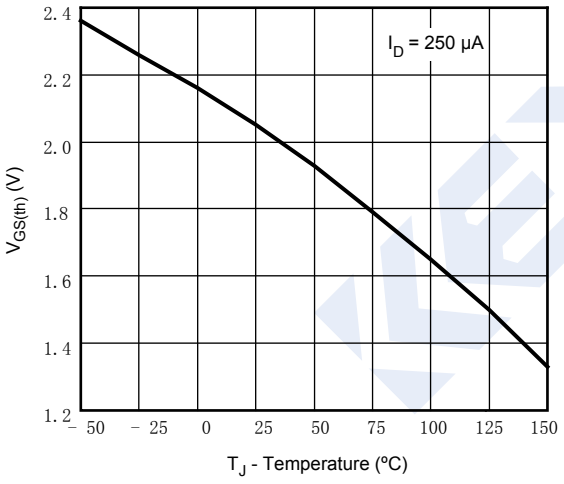
■ Typical Characterisitics

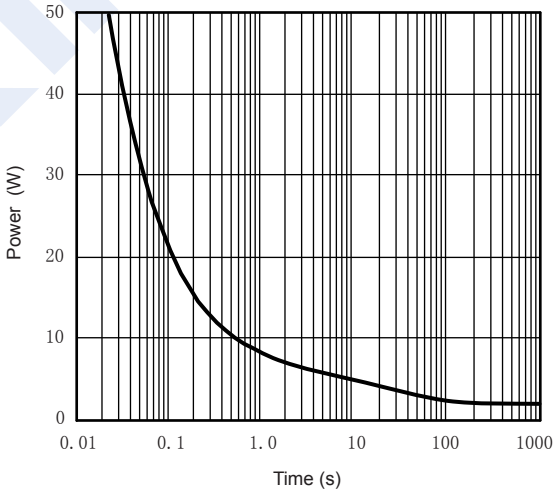


Source-Drain Diode Forward Voltage

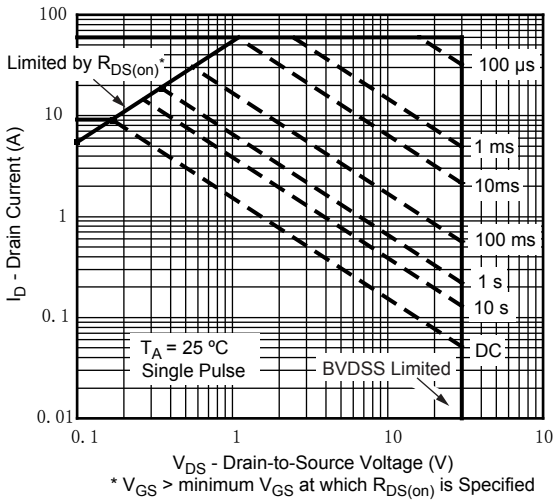


On-Resistance vs. Gate-to-Source Voltage





Single Pulse Power, Junction-to-Ambient



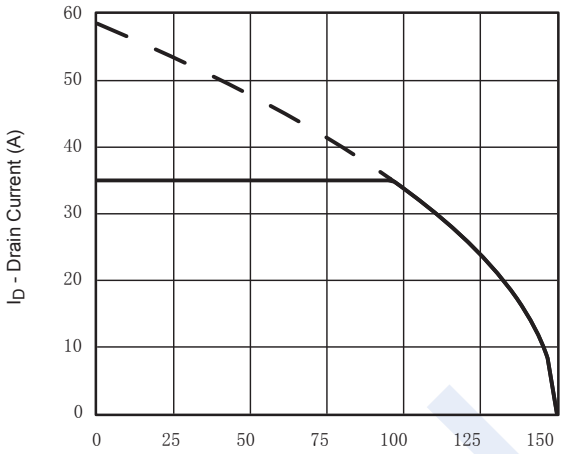
* V_{GS} > minimum V_{GS} at which $R_{DS(on)}$ is Specified

Safe Operating Area, Junction-to-Ambient

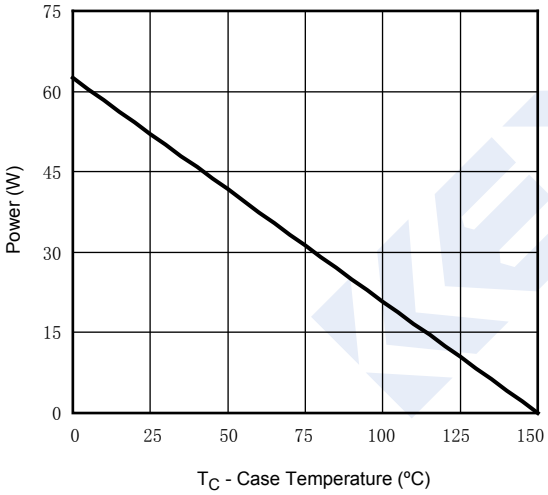
P-Channel MOSFET

SI7129DN (KI7129DN)

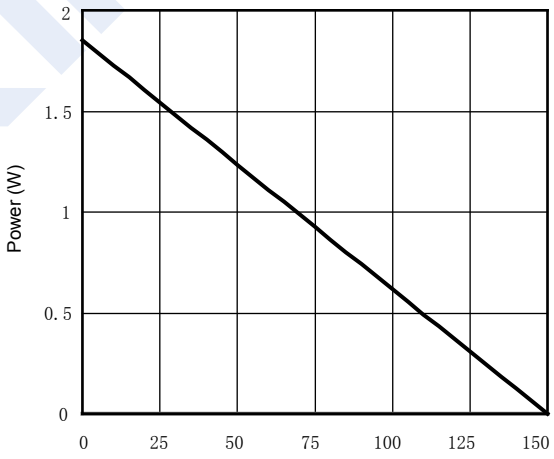
■ Typical Characterisitics



Current Derating



Power, Junction-to-Case

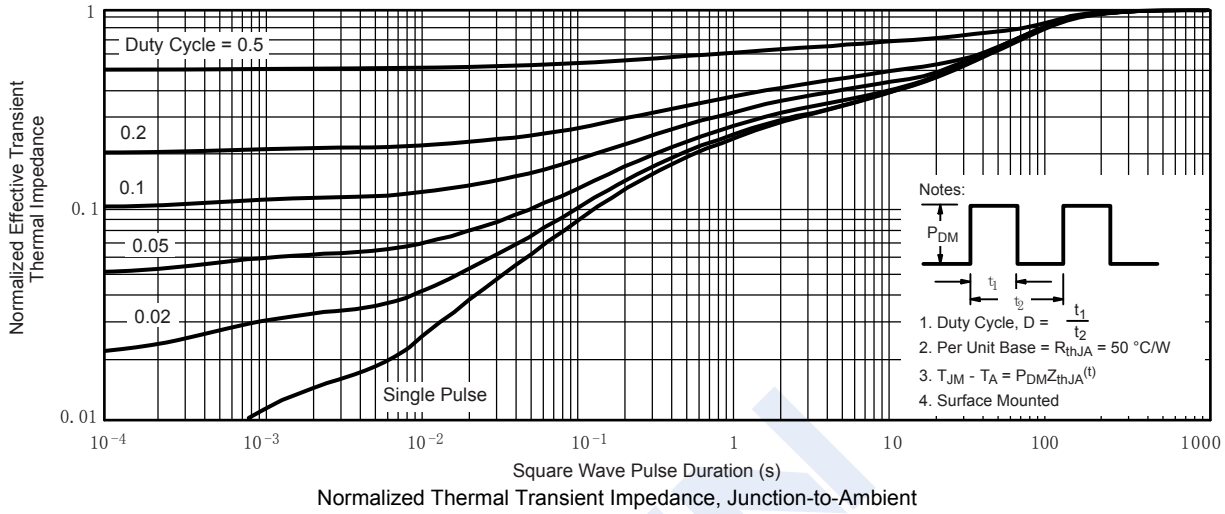


Power, Junction-to-Ambient

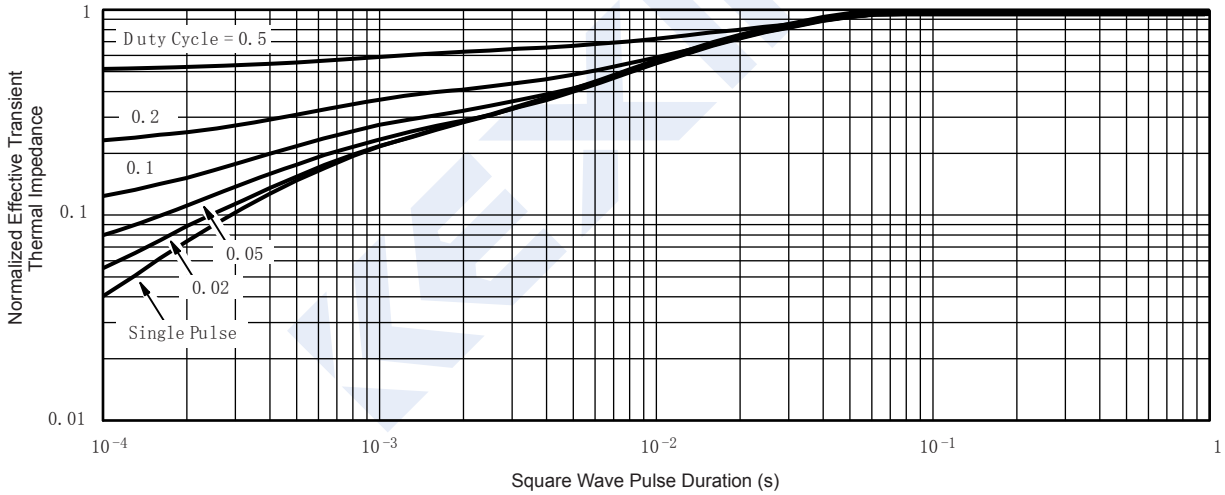
P-Channel MOSFET

SI7129DN (KI7129DN)

■ Typical Characterisitics

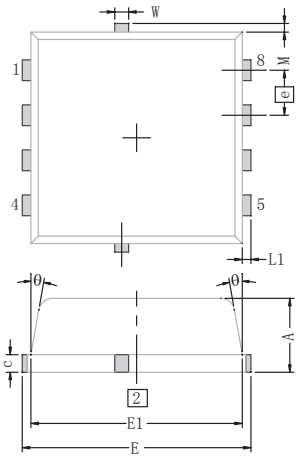


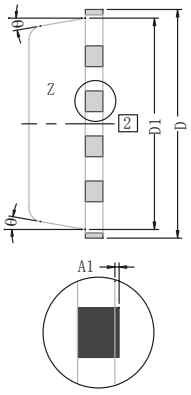
Normalized Thermal Transient Impedance, Junction-to-Ambient



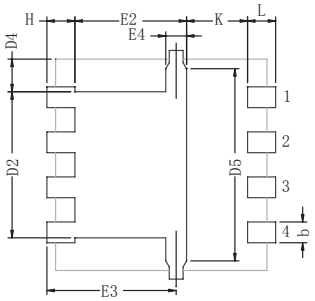
Normalized Thermal Transient Impedance, Junction-to-Case

PowerPAK ® 1212-8 (DFN), SINGLE/DUAL

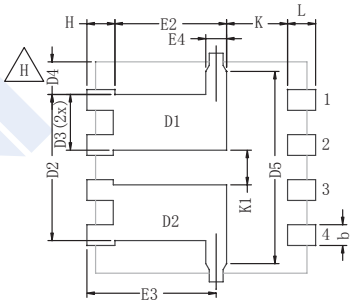




Detail Z



Backside View of Single Pad



Backside View of Dual Pad

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	0.00	-	0.05	0.000	-	0.002
b	0.23	0.30	0.41	0.009	0.012	0.016
c	0.23	0.28	0.33	0.009	0.011	0.013
D	3.20	3.30	3.40	0.126	0.130	0.134
D1	2.95	3.05	3.15	0.116	0.120	0.124
D2	1.98	2.11	2.24	0.078	0.083	0.088
D3	0.48	-	0.89	0.019	-	0.035
D4	0.47 TYP.			0.0185 TYP.		
D5	2.3 TYP.			0.090 TYP.		
E	3.20	3.30	3.40	0.126	0.130	0.134
E1	2.95	3.05	3.15	0.116	0.120	0.124
E2	1.47	1.60	1.73	0.058	0.063	0.068
E3	1.75	1.85	1.98	0.069	0.073	0.078
E4	0.34 TYP.			0.013 TYP.		
e	0.65 BSC			0.026 BSC		
K	0.86 TYP.			0.034 TYP.		
K1	0.35	-	-	0.014	-	-
H	0.30	0.41	0.51	0.012	0.016	0.020
L	0.30	0.43	0.56	0.012	0.017	0.022
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.		

PowerPAK ® 1212-8 (DFN), SINGLE/DUAL

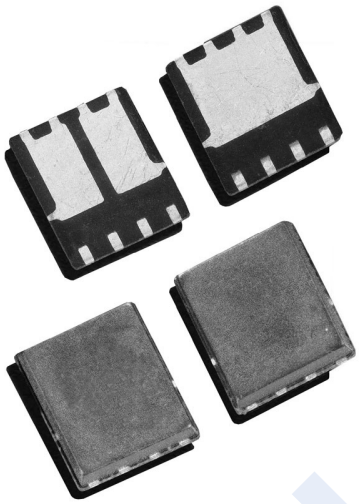
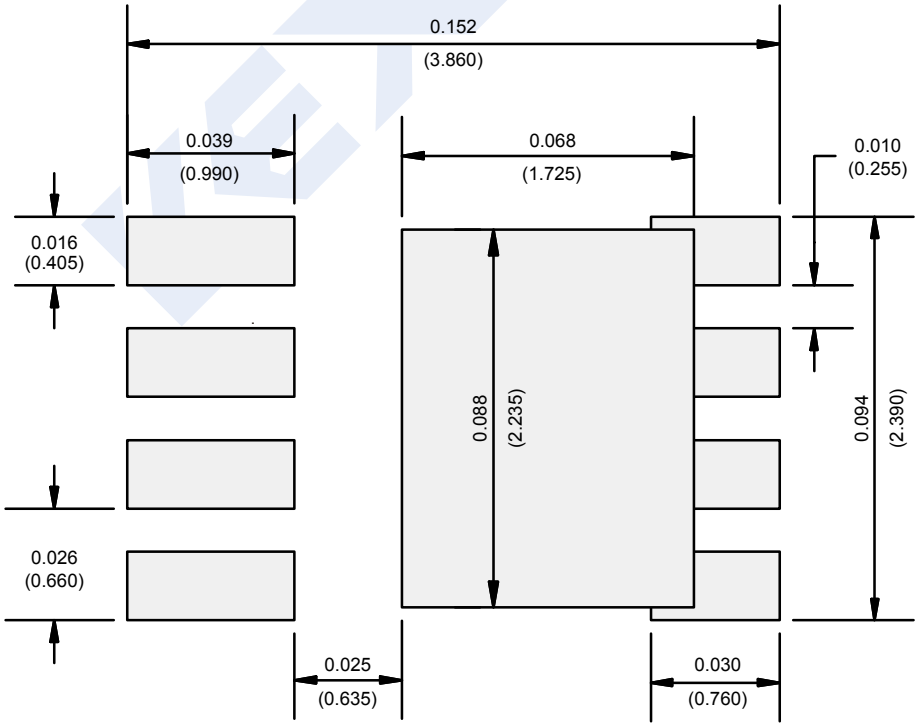


Figure 1. PowerPAK 1212 (DFN)Devices

RECOMMENDED MINIMUM PADS FOR PowerPAK ® 1212-8 (DFN) Single



Recommended Minimum Pads
Dimensions in Inches/(mm)