



YOUSHANG SEMICONDUCTOR

设计研发新型功率器件

各类小信号开关

中低压及高压大电流等场效应管

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企业微信二维码



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Product Summary

Device	BV _{DSS}	R _{DS(ON)} Max	I _D Max T _C = +25°C
Q1& Q2	30V	11.1mΩ @ V _{GS} = 10V	30A
		15.0mΩ @ V _{GS} = 4.5V	25A

Features and Benefits

- Ultra Low Gate Threshold Voltage
- Low On-Resistance
- Low Input Capacitance
- Fast Switching Speed

Description

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

Applications

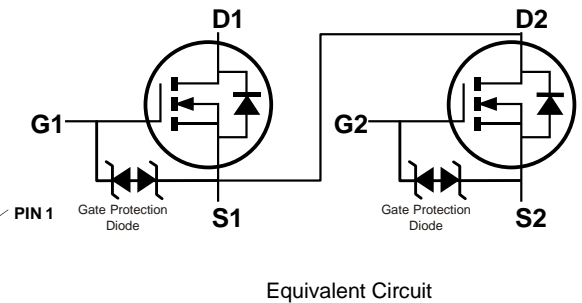
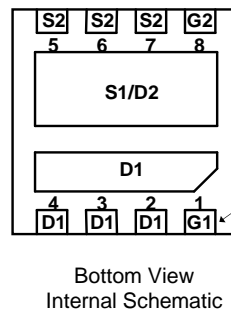
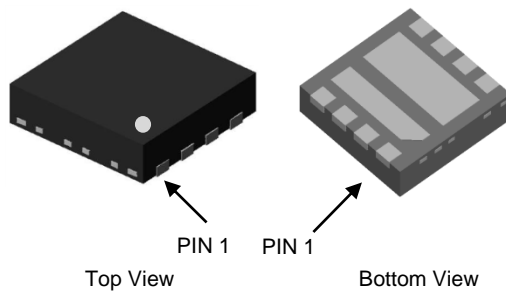
- General Purpose Interfacing Switch
- Power Management Functions

Mechanical Data

- Case: V-DFN3030-8
- Case Material: Molded Plastic, "Green" Molding Compound.
UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminals: Finish – NiPdAu over Copper Leadframe. Solderable per MIL-STD-202, Method 208 (e4)
- Weight: 0.02 grams (Approximate)



V-DFN3030-8 (Type KS)



Maximum Ratings (@T_J = +25°C, unless otherwise specified.)

Characteristic			Symbol	Q1&Q2	Unit
Drain-Source Voltage			V _{DSS}	30	V
Gate-Source Voltage			V _{GSS}	±12	V
Continuous Drain Current (Note 6) V _{GS} = 10V	Steady State	T _A = +25°C T _A = +70°C	I _D	10.6 8.5	A
Continuous Drain Current (Note 7) V _{GS} = 10V	Steady State	T _C = +25°C T _C = +70°C	I _D	30 25	A
Maximum Body Diode Forward Current (Note 6)			I _S	2.1	A
Pulsed Drain Current (100μs Pulse, Duty Cycle = 1%)			I _{DM}	80	A
Pulsed Body Diode Forward Current (100μs Pulse, Duty Cycle = 1%)			I _{SM}	80	A
Avalanche Current (Note 8) L = 0.1mH			I _{AS}	19	A
Avalanche Energy (Note 8) L = 0.1mH			E _{AS}	18	mJ

Thermal Characteristics (@T_J = +25°C, unless otherwise specified.)

Characteristic		Symbol	Value	Unit
Total Power Dissipation (Note 5)	T _A = +25°C	P _D	1.1	W
Thermal Resistance, Junction to Ambient (Note 5)	Steady State	R _{θJA}	112	°C/W
Total Power Dissipation (Note 6)	T _A = +25°C	P _D	1.9	W
Thermal Resistance, Junction to Ambient (Note 6)	Steady State	R _{θJA}	66	°C/W
Total Power Dissipation (Note 7)	T _C = +25°C	P _D	16	W
Thermal Resistance, Junction to Case (Note 7)		R _{θJC}	8	°C/W
Operating and Storage Temperature Range		T _J , T _{STG}	-55 to +150	°C

Electrical Characteristics (@T_J = +25°C, unless otherwise specified.)

Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
OFF CHARACTERISTICS (Note 9)						
Drain-Source Breakdown Voltage	BV _{DSS}	30	—	—	V	V _{GS} = 0V, I _D = 250μA
Zero Gate Voltage Drain Current	I _{DSS}	—	—	1	μA	V _{DS} = 24V, V _{GS} = 0V
Gate-Source Leakage	I _{GSS}	—	—	±10	μA	V _{GS} = ±10V, V _{DS} = 0V
ON CHARACTERISTICS (Note 9)						
Gate Threshold Voltage	V _{GS(TH)}	0.5	—	1.8	V	V _{DS} = V _{GS} , I _D = 250μA
Static Drain-Source On-Resistance	R _{DS(ON)}	—	8.6	11.1	mΩ	V _{GS} = 10V, I _D = 11A
		—	11.5	15		V _{GS} = 4.5V, I _D = 7A
Diode Forward Voltage	V _{SD}	—	0.8	1.2	V	V _{GS} = 0V, I _S = 8.8A
DYNAMIC CHARACTERISTICS (Note 10)						
Input Capacitance	C _{iss}	—	894	—	pF	V _{DS} = 15V, V _{GS} = 0V, f = 1.0MHz
Output Capacitance	C _{oss}	—	381	—		
Reverse Transfer Capacitance	C _{rss}	—	76	—		
Gate Resistance	R _g	—	1.1	—	Ω	V _{DS} = 0V, V _{GS} = 0V, f = 1.0MHz
Total Gate Charge (V _{GS} = 10V)	Q _g	—	14.6	—	nC	V _{DS} = 15V, I _D = 10A
Total Gate Charge (V _{GS} = 4.5V)	Q _g	—	7.4	—		
Gate-Source Charge	Q _{gs}	—	1.6	—		
Gate-Drain Charge	Q _{gd}	—	3.4	—		
Turn-On Delay Time	t _{D(ON)}	—	3.4	—	ns	V _{GS} = 10V, V _{DD} = 15V, R _g = 1Ω, I _D = 8.8A
Turn-On Rise Time	t _r	—	5.5	—		
Turn-Off Delay Time	t _{D(OFF)}	—	9.6	—		
Turn-Off Fall Time	t _f	—	1.6	—		
Body Diode Reverse Recovery Time	t _{RR}	—	17	—	ns	I _F = 8.8A, di/dt = 100A/μs
Body Diode Reverse Recovery Charge	Q _{RR}	—	6.7	—	nC	

- Notes:
- Device mounted on FR-4 substrate PC board, 2oz copper, with minimum recommended pad layout.
 - Device mounted on FR-4 substrate PC board, 2oz copper, with 1inch square copper plate.
 - Thermal resistance from junction to soldering point (on the exposed drain pad).
 - UIS in production with L = 0.1mH, starting T_A = +25°C.
 - Short duration pulse test used to minimize self-heating effect.
 - Guaranteed by design. Not subject to product testing.

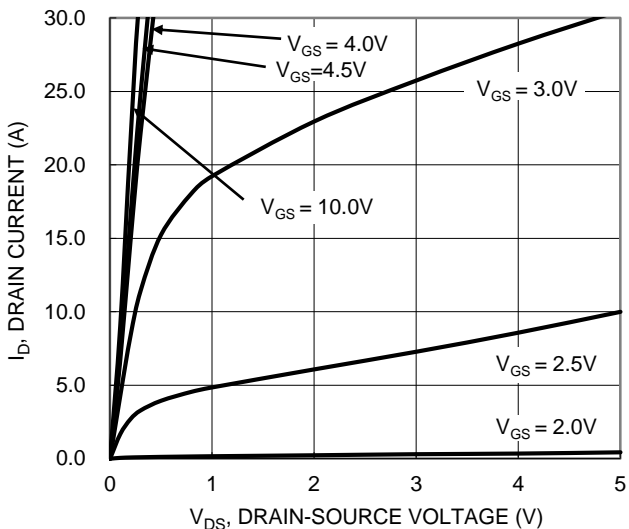


Figure 1. Typical Output Characteristic

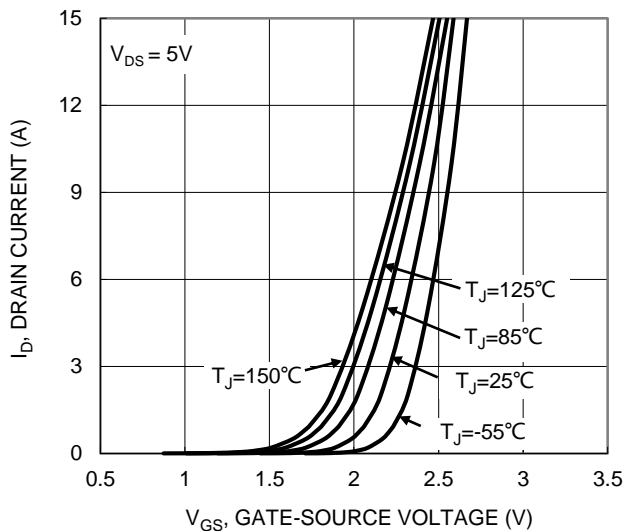


Figure 2. Typical Transfer Characteristic

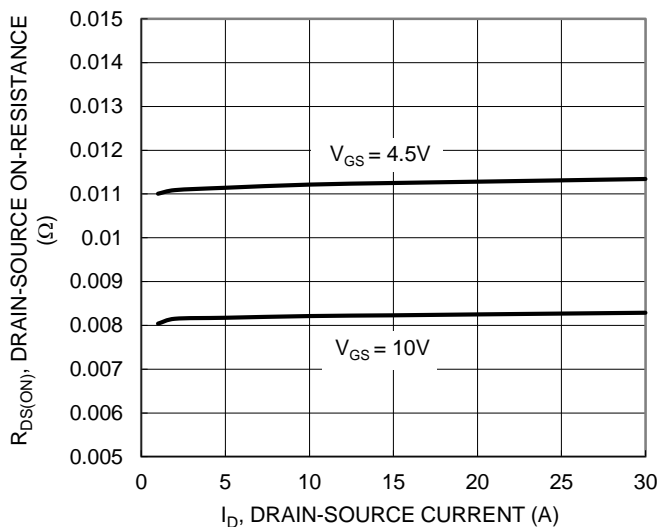


Figure 3. Typical On-Resistance vs. Drain Current and Gate Voltage

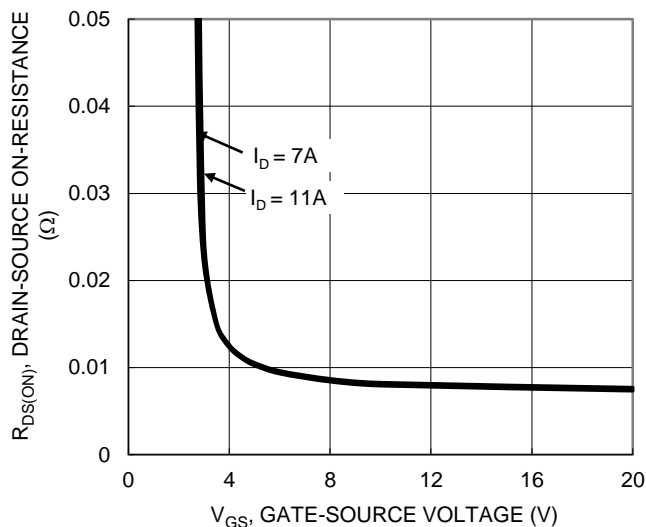


Figure 4. Typical Transfer Characteristic

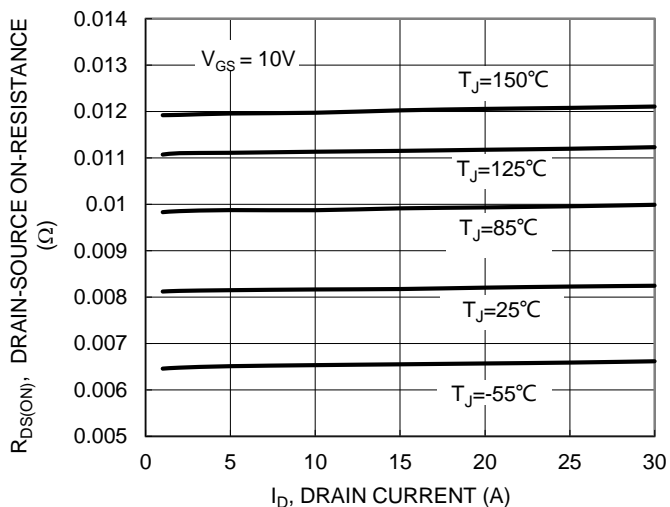


Figure 5. Typical On-Resistance vs. Drain Current and Junction Temperature

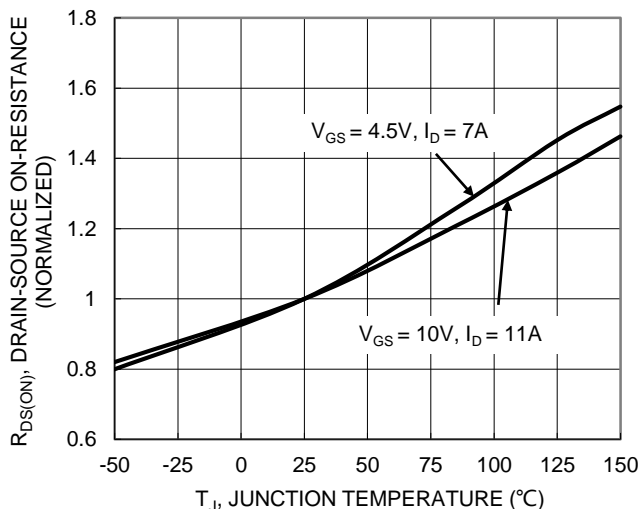


Figure 6. On-Resistance Variation with Junction Temperature

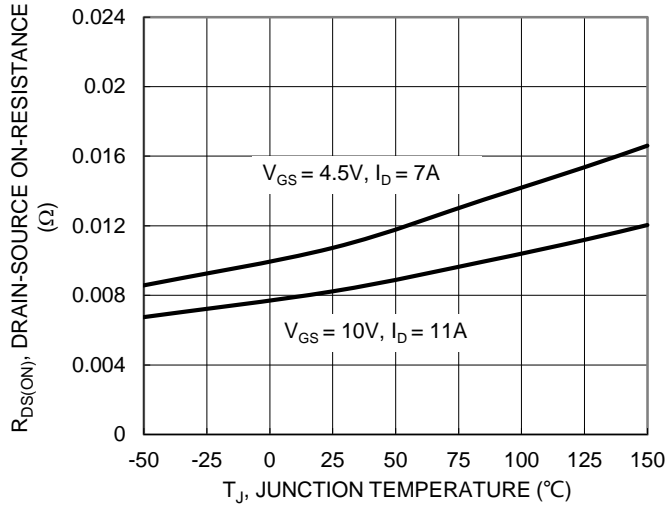


Figure 7. On-Resistance Variation with Junction Temperature

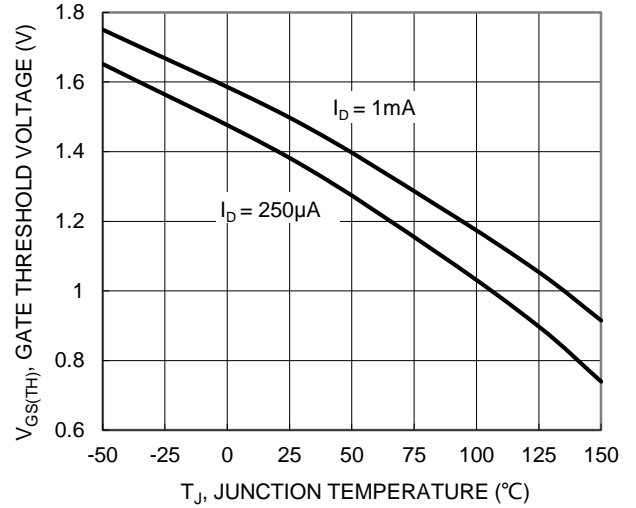


Figure 8. Gate Threshold Variation vs. Junction Temperature

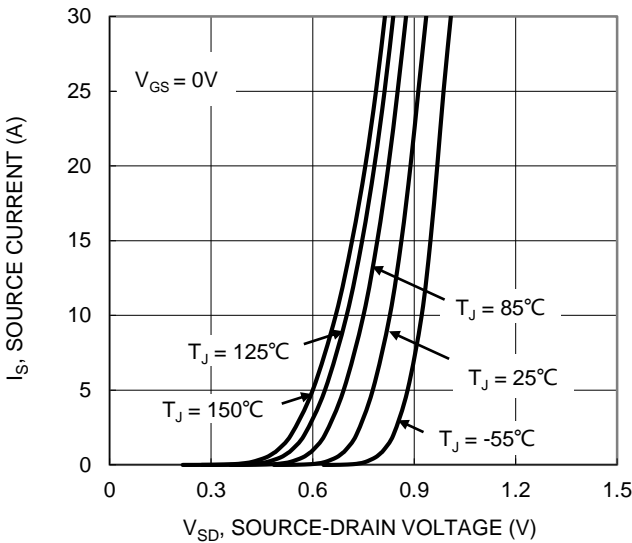


Figure 9. Diode Forward Voltage vs. Current

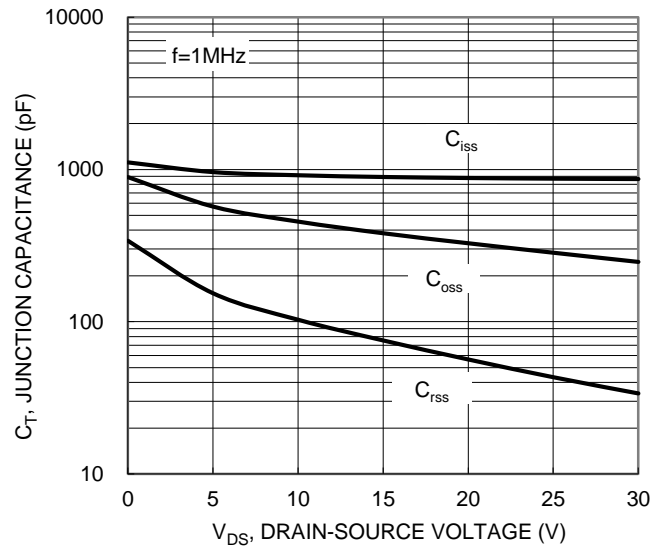


Figure 10. Typical Junction Capacitance

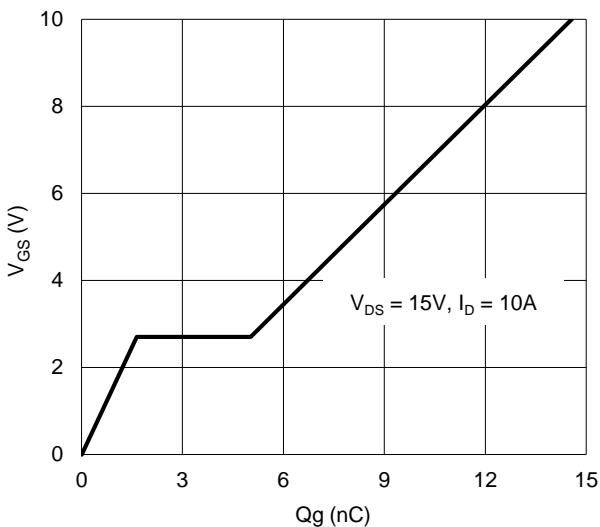


Figure 11. Gate Charge

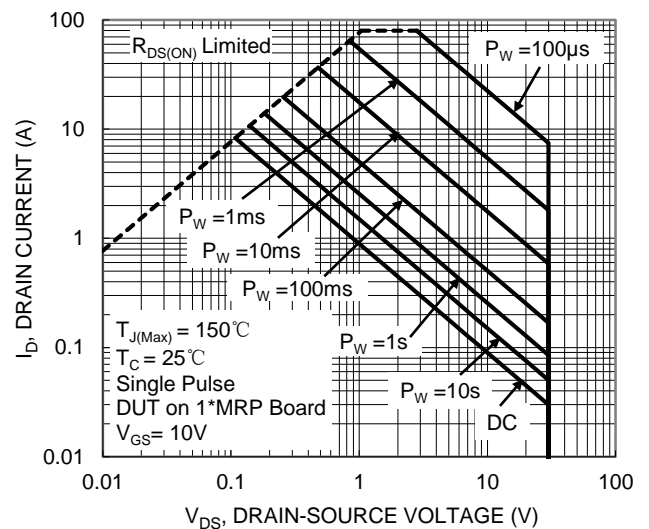


Figure 12. SOA, Safe Operation Area

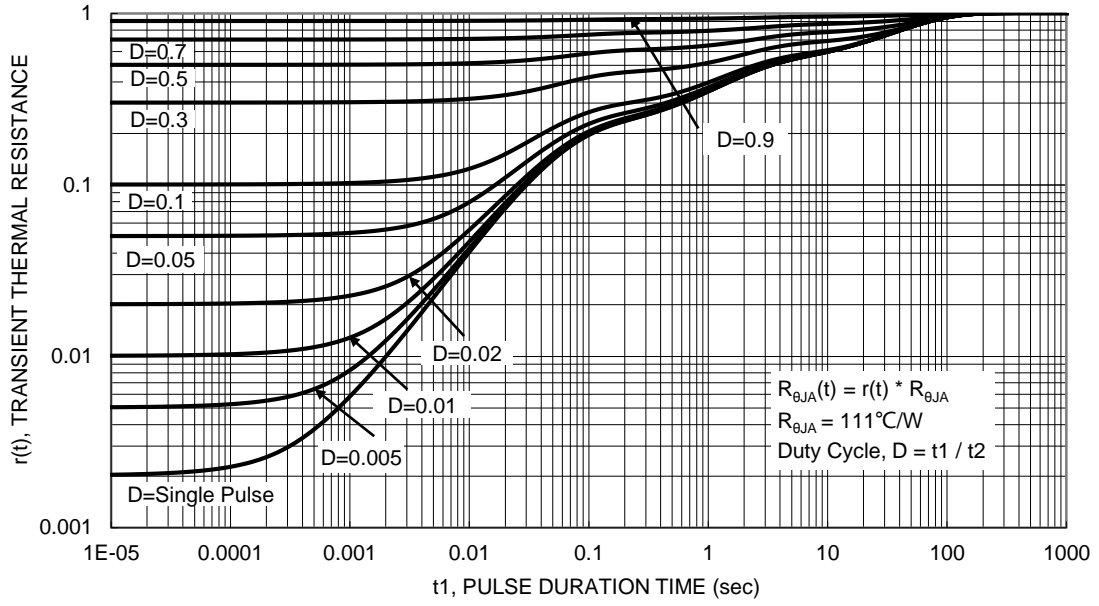
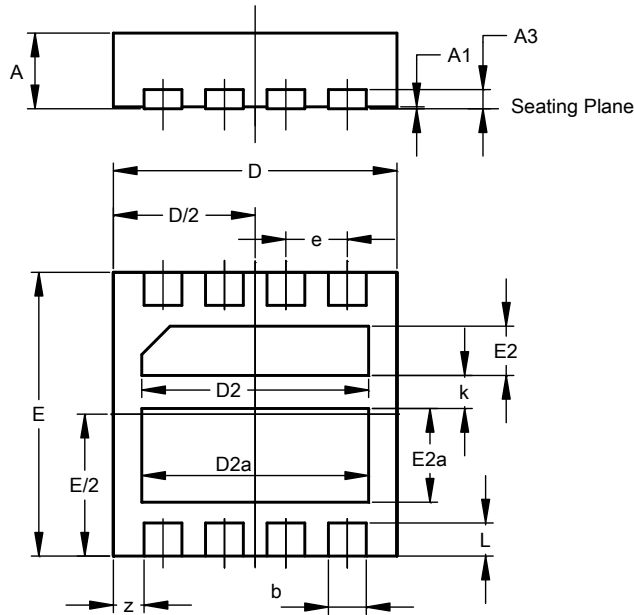


Figure 13. Transient Thermal Resistance

Package Outline Dimensions

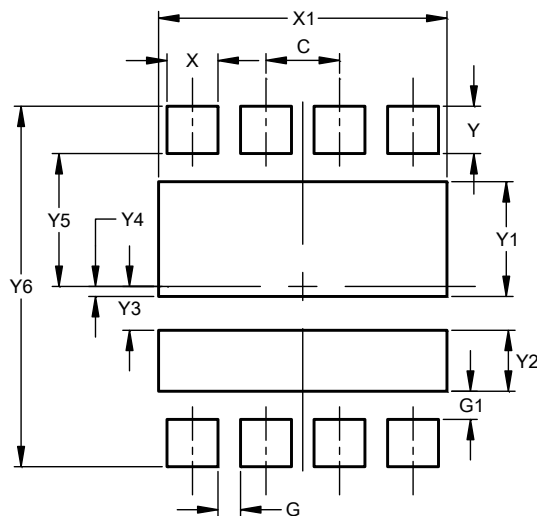
V-DFN3030-8 (Type KS)



V-DFN3030-8 (Type KS)			
Dim	Min	Max	Typ
A	0.77	0.85	0.80
A1	0.00	0.05	0.02
A3	0.20BSC		
b	0.35	0.45	0.40
D	2.95	3.050	3.00
D2	2.30	2.50	2.40
D2a	2.30	2.50	2.40
E	2.95	3.050	3.00
E2	0.42	0.62	0.52
E2a	0.89	1.09	0.99
e	0.65BSC		
k	-	-	0.35
L	0.30	0.40	0.35
z	0.325BSC		
All Dimensions in mm			

Suggested Pad Layout

V-DFN3030-8 (Type KS)



Dimensions	Value (in mm)
C	0.650
G	0.200
G1	0.250
X	0.450
X1	2.550
Y	0.420
Y1	1.019
Y2	0.541
Y3	0.389
Y4	0.089
Y5	1.180
Y6	3.200