

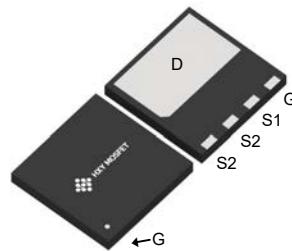


Features

- Wide bandgap SiC MOSFET technology
- Low On-Resistance with High Blocking Voltage
- Low Capacitances with High-Speed switching
- Low reverse recovery(Qrr)
- Halogen free, RoHS compliant

Benefits

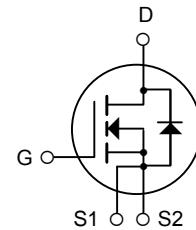
- Reduce switching losses
- Increased system Switching Frequency
- Increased power density
- Reduction of heat sink requirements



DFN8X8B

Applications

- Switch mode power supplies
- Renewable energy
- On Board Charger
- High Voltage DC/DC Converters



Ordering Part Number	Package	Brand
IPL65R065CFD7AUMA1	DFN8X8B	HXY MOSFET

Maximum Ratings ($T_c = 25^\circ\text{C}$ unless otherwise specified)

Symbol	Parameter	Test conditions	Value	Unit	Note
V_{DSmax}	Drain-Source Voltage	$V_{GS} = 0\text{V}$, $I_D = 100\mu\text{A}$	1200	V	
V_{GSmax}	Gate-Source voltage	AC ($f > 1\text{ Hz}$)	-10/+25	V	
V_{GSop}	Recommend Gate-Source Voltage	Static	-4/+18	V	
I_D	Continuous Drain current	$V_{GS} = 18\text{V}$, $T_c = 25^\circ\text{C}$	68	A	Fig. 14
		$V_{GS} = 18\text{V}$, $T_c = 100^\circ\text{C}$	48		
$I_{D,pulse}$	Pulsed Drain Current	Pulse with t_p limited by T_{jmax} at 1 ms Pulse with t_p limited by T_{jmax} at 100 μs	96 174	A	
P_D	Power Dissipation	$T_c = 25^\circ\text{C}$, $T_j = 175^\circ\text{C}$	326	W	Fig. 16
T_j	Operating junction temperature		-55~175	°C	
T_{stg}	Storage temperature		-55~175	°C	



Thermal Characteristics

Symbol	Parameter	Value			Unit	Note
		Min.	Typ.	Max.		
$R_{th(jc)}$	Thermal resistance from Junction to Case		0.46		K/W	Fig. 15
$R_{th(ja)}$	Thermal resistance from Junction to Ambient		50		K/W	

Electrical Characteristics ($T_c = 25^\circ\text{C}$ unless otherwise specified)

Static Characteristics

Symbol	Parameter	Test conditions	Value			Unit	Note
			Min.	Typ.	Max.		
$V_{(BR)DSS}$	Drain-Source Breakdown voltage	$V_{GS} = 0\text{V}, I_D = 100\mu\text{A}$	650			V	
$V_{GS(th)}$	Gate Threshold voltage	$V_{GS} = V_{DS}, I_D = 5\text{mA}$		2.7		V	Fig. 9
		$V_{GS} = V_{DS}, I_D = 5\text{mA}, T_j = 175^\circ\text{C}$		1.8			
I_{GSS}	Gate-Source Leakage current	$V_{GS} = 20\text{V}, V_{DS} = 0\text{V}$			250	nA	
I_{DSS}	Zero Gate Voltage Drain Current	$V_{DS} = 650\text{V}, V_{GS} = 0\text{V}, T_j = 25^\circ\text{C}$		1	50	μA	
$R_{DS(on)}$	Drain-Source On-state Resistance	$V_{GS} = 20\text{V}, I_D = 20\text{A}$		45	58	$\text{m}\Omega$	Fig. 3, 4, 5
		$V_{GS} = 20\text{V}, I_D = 20\text{A}, T_j = 175^\circ\text{C}$		60			
g_{fs}	Transconductance	$V_{DS} = 20\text{V}, I_D = 20\text{A}$		18		S	Fig. 6
		$V_{DS} = 20\text{V}, I_D = 20\text{A}, T_j = 175^\circ\text{C}$		11			



Gate Charge Characteristics

Symbol	Parameter	Test conditions	Value			Unit	Note
			Min.	Typ.	Max.		
Q _{GS}	Gate to Source Charge	$V_{DS} = 400V$ $I_D = 20A$ $V_{GS} = -4V/20V$		16.4		nC	Fig. 10
Q _{GD}	Gate to Drain Charge			16.5			
Q _G	Total Gate Charge			66.2			

AC Characteristics

Symbol	Parameter	Test conditions	Value			Unit	Note
			Min.	Typ.	Max.		
C _{iss}	Input Capacitance	$V_{GS} = 0V, V_{DS} = 600V$ $f = 1 \text{ MHz}$ $V_{AC} = 25\text{mV}$		1410		pF	Fig. 13
C _{oss}	Output Capacitance			119		pF	
C _{rss}	Reverse Transfer Capacitance			4		pF	
R _{G(int)}	Internal Gate Resistance	f=1 MHz, V _{AC} = 25mV		1.8		Ω	

Reverse Diode Characteristics

Symbol	Parameter	Test conditions	Value			Unit	Note
			Min.	Typ.	Max.		
V _{SD}	Diode Forward Voltage	$V_{GS} = -4V, I_{SD} = 8.8A$		3.7		V	Fig. 7,8
		$V_{GS} = -4V, I_{SD} = 8.8A, T_j = 175^\circ C$		3.1			
I _S	Continuous Diode Forward Current	$V_{GS} = -4V, T_c = 25^\circ C$		62		A	
I _{S, pulse}	Diode pulse Current	$V_{GS} = -4V, \text{pulse width } t_p \text{ limited by } T_{jmax}$		96		A	



Typical Performance

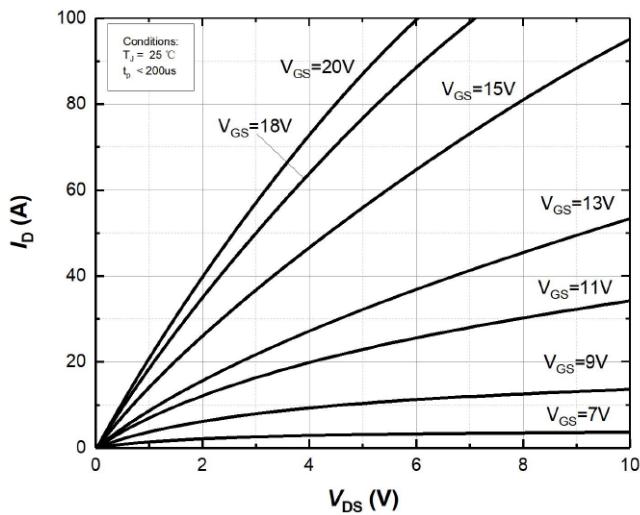


Figure 1. Output characteristics at $T_j=25^\circ\text{C}$

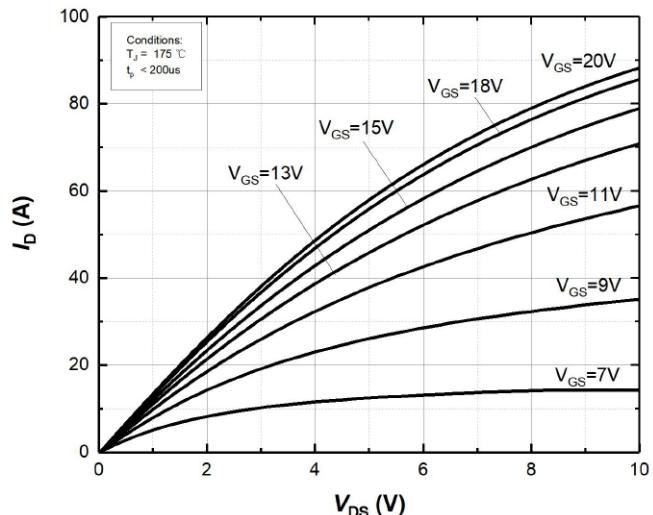


Figure 2. Output characteristics at $T_j=175^\circ\text{C}$

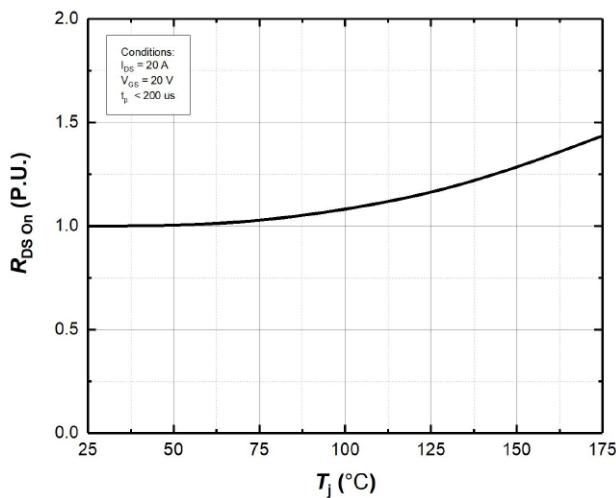


Figure 3. Normalized On-Resistance vs. Temperature

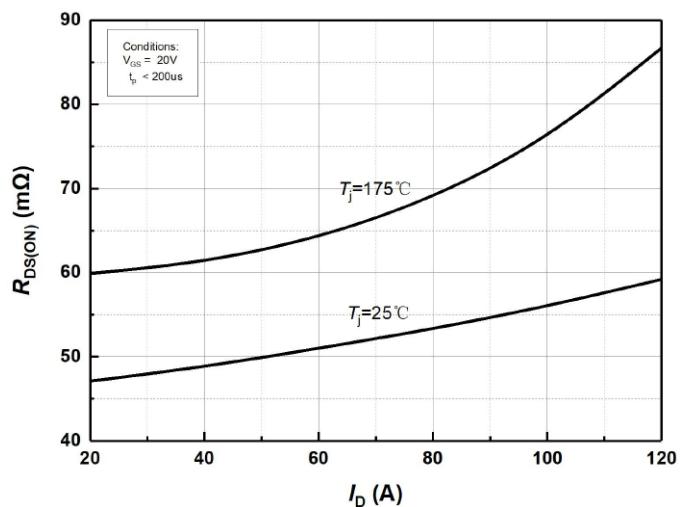


Figure 4. On-Resistance vs. Drain current for Various Temperature

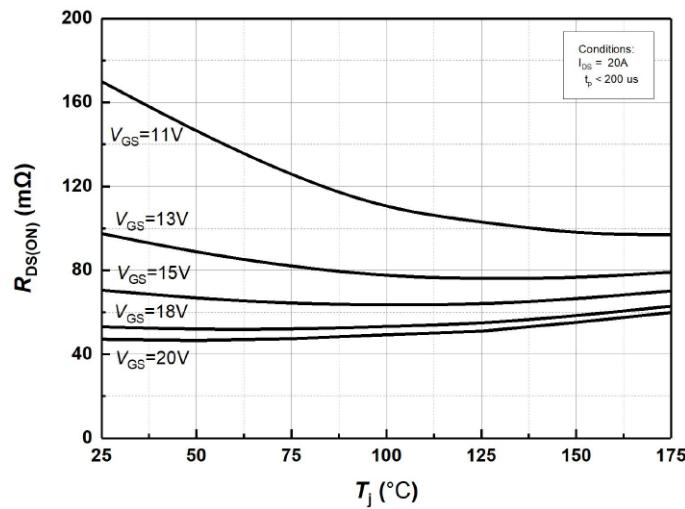


Figure 5. On-Resistance vs. Temperature for Various Gate Voltage

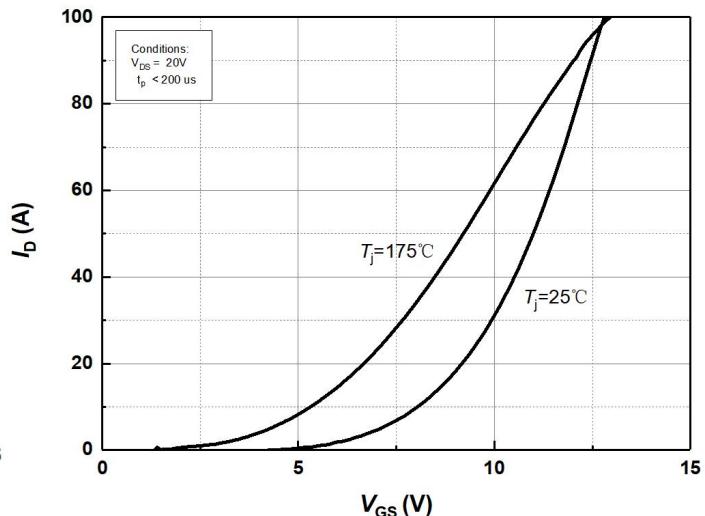


Figure 6. Transfer Characteristics for Various Junction Temperatures

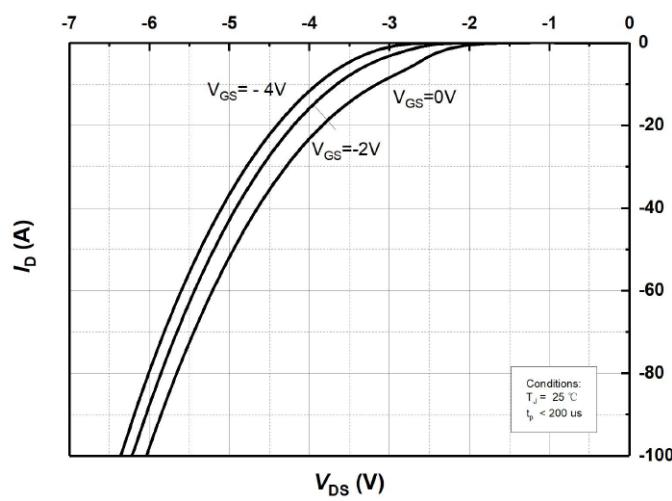


Figure 7. Body Diode Characteristics at $T_J=25^\circ\text{C}$

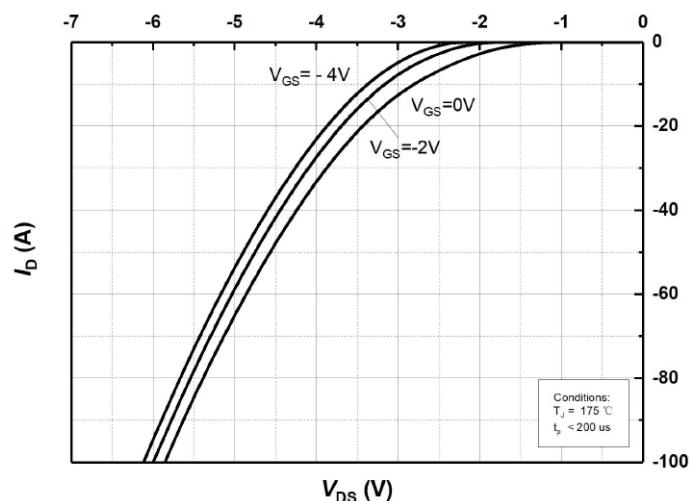


Figure 8. Body Diode Characteristics at $T_J=175^\circ\text{C}$

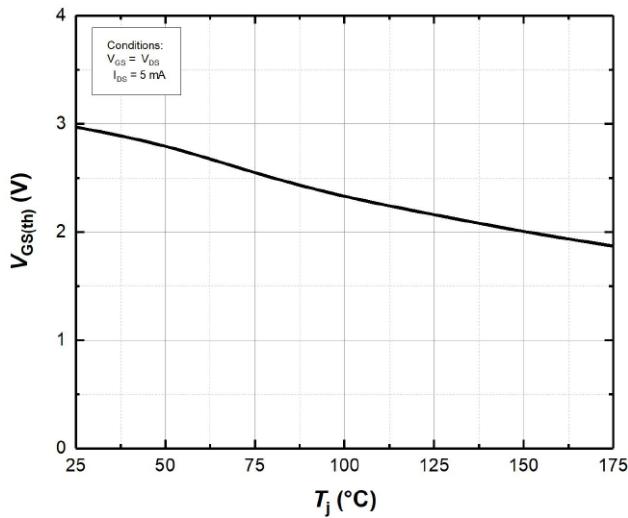


Figure 9. Threshold Voltage vs. Temperature

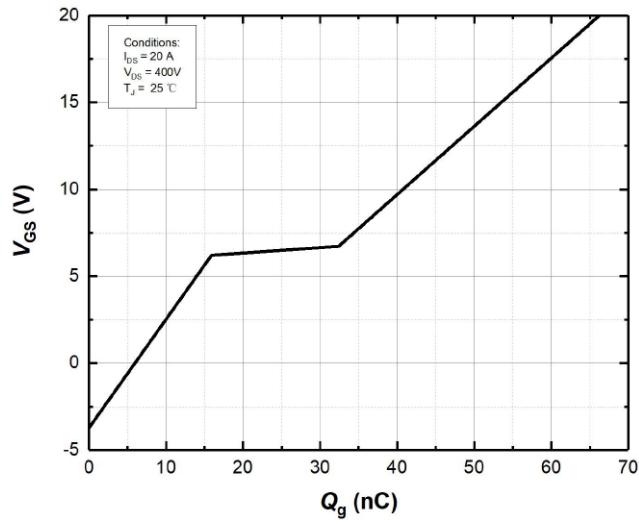


Figure 10 Gate Charge Characteristics

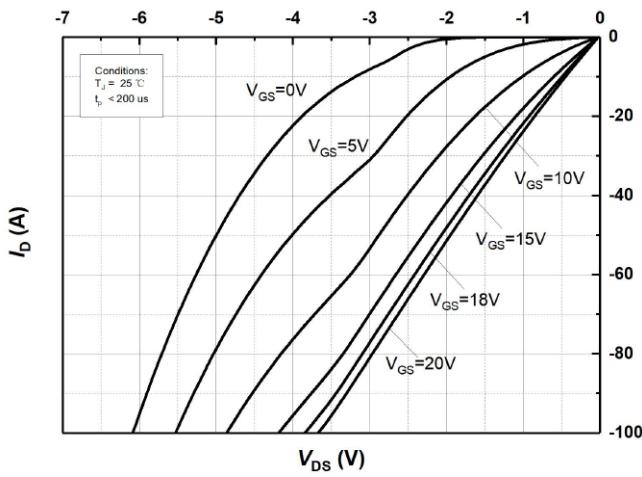


Figure 11. 3rd Quadrant Characteristic at $T_j=25^\circ\text{C}$

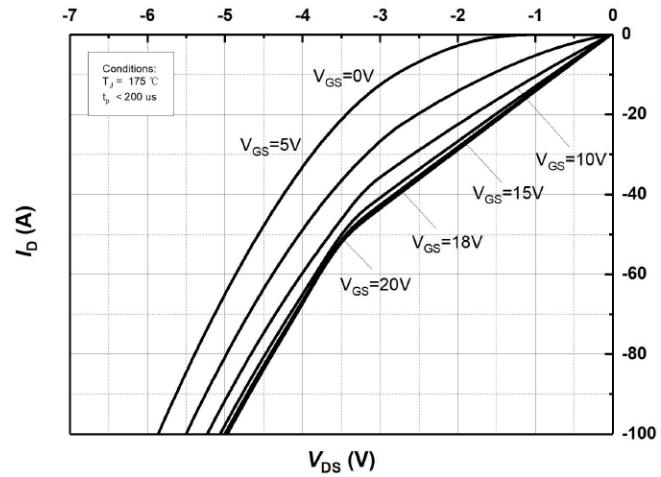


Figure 12. 3rd Quadrant Characteristic at $T_j=175^\circ\text{C}$

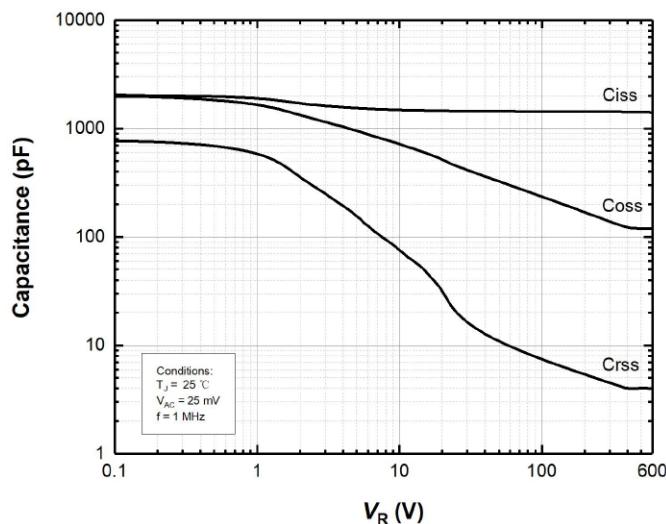


Figure 13. Capacitances vs. Drain-Source Voltage (0 – 600V)

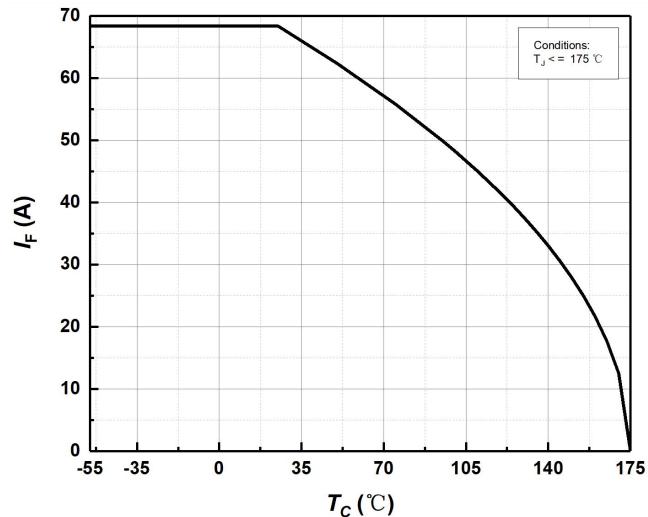


Figure 14. Continuous Drain Current Derating vs Case Temperature

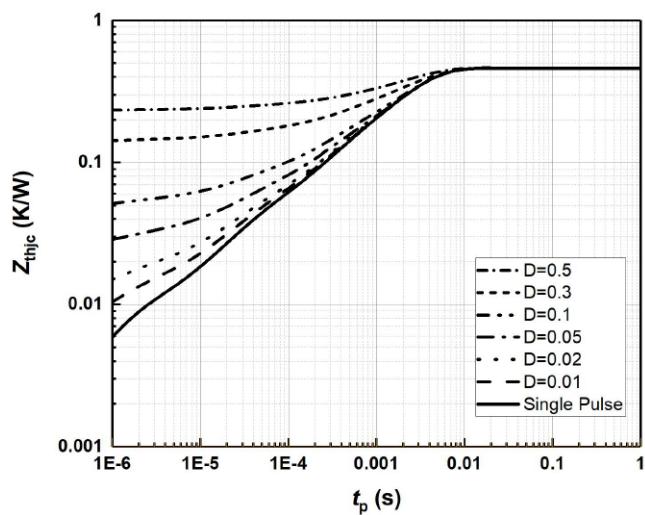


Figure 15. Transient Thermal Impedance (Junction – Case)

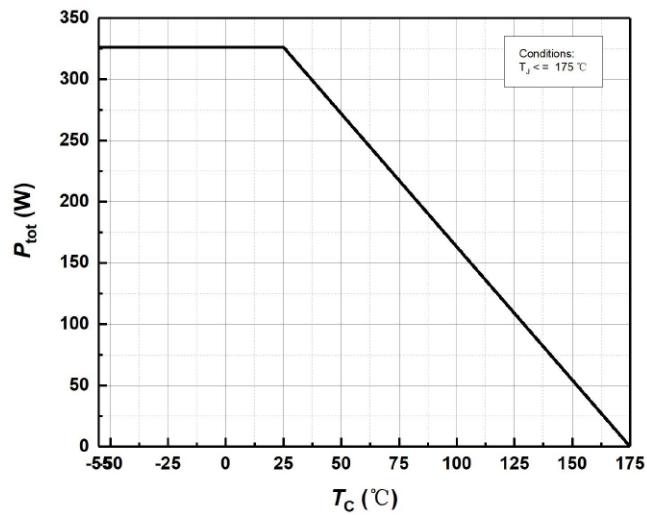


Figure 16. Maximum Power Dissipation Derating vs. Case Temperature

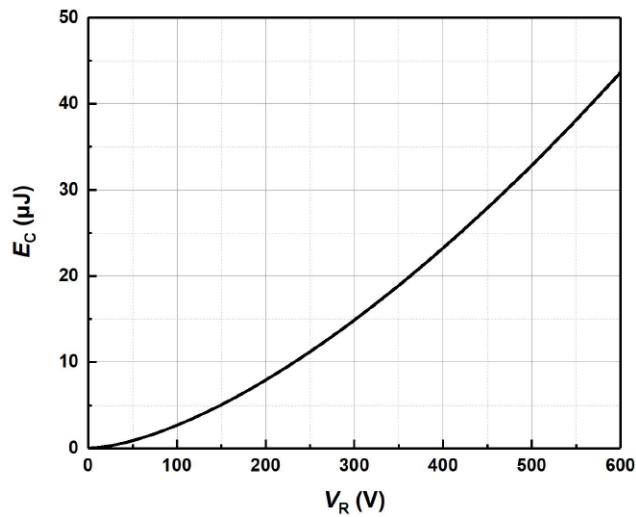


Figure 17. Output Capacitor Stored Energy

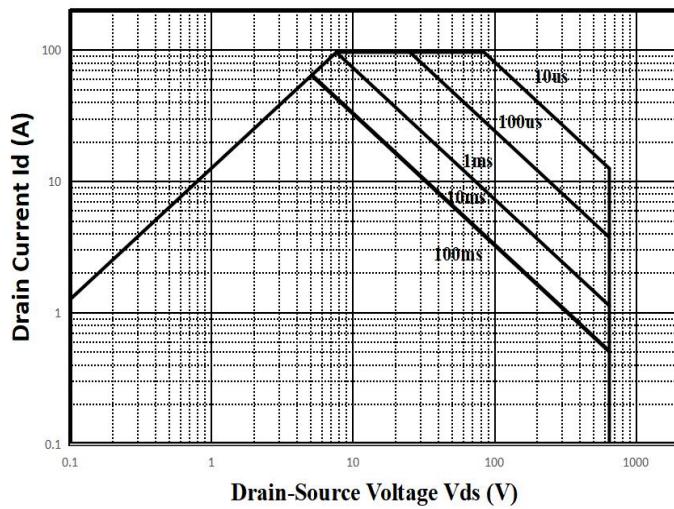
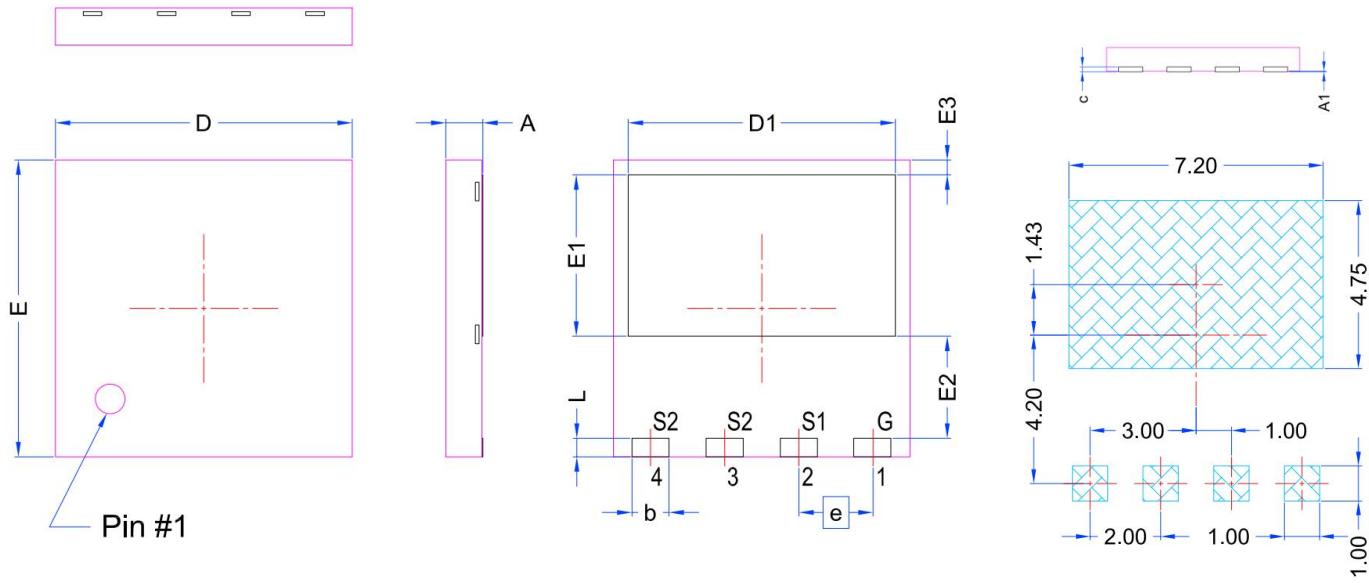


Figure 18. Safe Operating Area



Package Dimensions

Package DFN8X8B





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