



Features

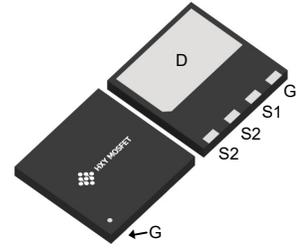
- Wide bandgap SiC MOSFET technology
- Low On-Resistance with High Blocking Voltage
- Low Capacitances with High-Speed switching
- Low reverse recovery(Qrr)
- Halogen free, RoHs compliant

Benefits

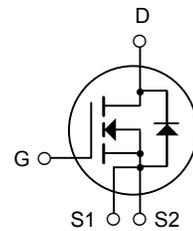
- Reduce switching losses
- Increased system Switching Frequency
- Increased power density
- Reduction of heat sink requirements

Applications

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



DFN8X8B



Ordering Part Number	Package	Brand
ST8L65N044M9	DFN8X8B	HXY MOSFET

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

Symbol	Parameter	Test conditions	Value	Unit	Note
V_{DSmax}	Drain-Source Voltage	$V_{GS} = 0V, I_D = 100\mu A$	650	V	
V_{GS}	Gate-Source voltage (transient)	$t_p \leq 500ns, \text{ duty cycle } \leq 1\%$	-8/+20	V	
V_{GSop}	Recommend Gate-Source Voltage	Static	-4/+18	V	
I_D	Continuous Drain current	$V_{GS} = 18V, T_C = 25^\circ C$	70	A	Fig. 14
		$V_{GS} = 18V, T_C = 100^\circ C$	49		
$I_{D,pulse}$	Pulsed Drain Current	Pulse with t_p limited by T_{jmax}	121	A	
P_D	Power Dissipation	$T_C = 25^\circ C, T_j = 175^\circ C$	214	W	Fig. 16
T_j	Operating junction temperature		-55~175	$^\circ C$	
T_{stg}	Storage temperature		-55~175	$^\circ C$	



Thermal Characteristics

Symbol	Parameter	Value			Unit	Note
		Min.	Typ.	Max.		
$R_{th(jc)}$	Thermal resistance from Junction to Case		0.7		K/W	Fig. 15
$R_{th(ja)}$	Thermal resistance from Junction to Ambient		40		K/W	

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

Static Characteristics

Symbol	Parameter	Test conditions	Value			Unit	Note
			Min.	Typ.	Max.		
$V_{(BR)DSS}$	Drain-Source Breakdown voltage	$V_{GS} = 0V, I_D = 100\mu A$	650			V	
$V_{GS(th)}$	Gate Threshold voltage	$V_{GS} = V_{DS}, I_D = 12mA$		2.7		V	Fig. 9
		$V_{GS} = V_{DS}, I_D = 12mA, T_j = 175^\circ\text{C}$		1.9			
I_{GSS}	Gate-Source Leakage current	$V_{GS} = 20V, V_{DS} = 0V$			250	nA	
I_{DSS}	Zero Gate Voltage Drain Current	$V_{DS} = 650V, V_{GS} = 0V, T_j = 25^\circ\text{C}$		1	50	μA	
$R_{DS(on)}$	Drain-Source On-state Resistance	$V_{GS} = 15V, I_D = 20A$		44		m Ω	Fig. 3, 4, 5
		$V_{GS} = 18V, I_D = 20A$		36	56		
g_{fs}	Transconductance	$V_{GS} = 15V, I_D = 20A, T_j = 175^\circ\text{C}$		52		S	Fig. 6
		$V_{GS} = 18V, I_D = 20A, T_j = 175^\circ\text{C}$		47			
g_{fs}	Transconductance	$V_{DS} = 18V, I_D = 20A$		15		S	Fig. 6
		$V_{DS} = 18V, I_D = 20A, T_j = 175^\circ\text{C}$		14			



Gate Charge Characteristics

Symbol	Parameter	Test conditions	Value			Unit	Note
			Min.	Typ.	Max.		
Q_{GS}	Gate to Source Charge	$V_{DS} = 400V$ $I_D = 20A$ $V_{GS} = -4V/20V$		19		nC	Fig. 10
Q_{GD}	Gate to Drain Charge			21			
Q_G	Total Gate Charge			80			

AC Characteristics

Symbol	Parameter	Test conditions	Value			Unit	Note
			Min.	Typ.	Max.		
C_{iss}	Input Capacitance	$V_{GS} = 0V, V_{DS} = 600V$ $f = 1\text{ MHz}$ $V_{AC} = 25mV$		1525		pF	Fig. 13
C_{oss}	Output Capacitance			115		pF	
C_{rss}	Reverse Transfer Capacitance			3.3		pF	
$R_{G(int)}$	Internal Gate Resistance	$f = 1\text{ MHz}, V_{AC} = 25mV$		1.4		Ω	

Reverse Diode Characteristics

Symbol	Parameter	Test conditions	Value			Unit	Note
			Min.	Typ.	Max.		
V_{SD}	Diode Forward Voltage	$V_{GS} = -4V, I_{SD} = 10A$		4.0		V	Fig. 7,8
		$V_{GS} = -4V, I_{SD} = 10A, T_j = 175^\circ C$		3.5			
I_S	Continuous Diode Forward Current	$V_{GS} = -4V, T_C = 25^\circ C$		44		A	
$I_{S, pulse}$	Diode pulse Current	$V_{GS} = -4V, \text{pulse width } t_p \text{ limited by } T_{jmax}$		121		A	



Typical Performance

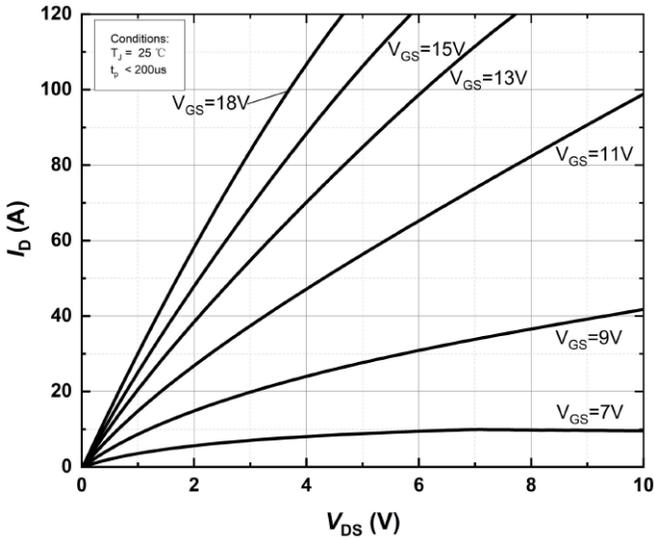


Figure 1. Output characteristics at $T_j=25^\circ\text{C}$

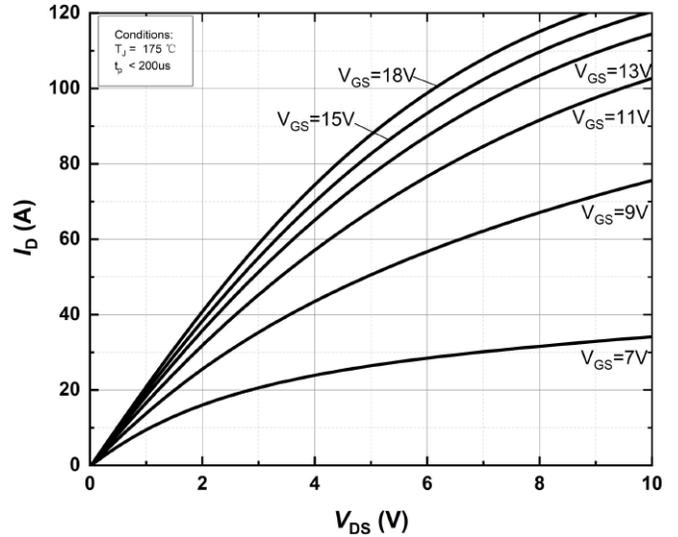


Figure 2. Output characteristics at $T_j=175^\circ\text{C}$

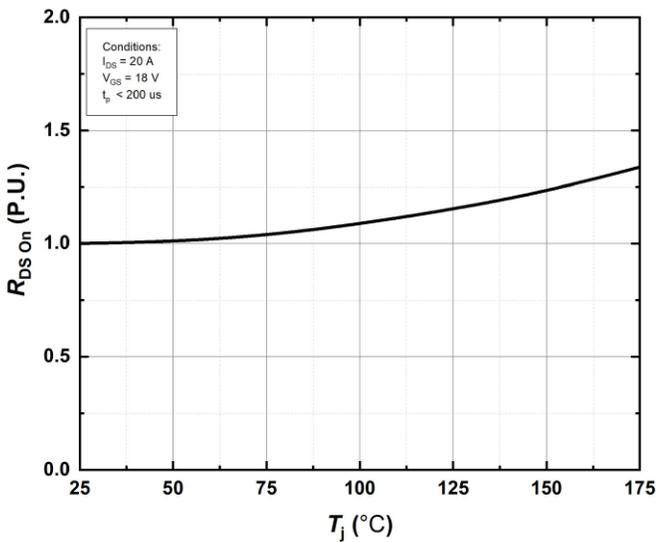


Figure 3. Normalized On-Resistance vs. Temperature

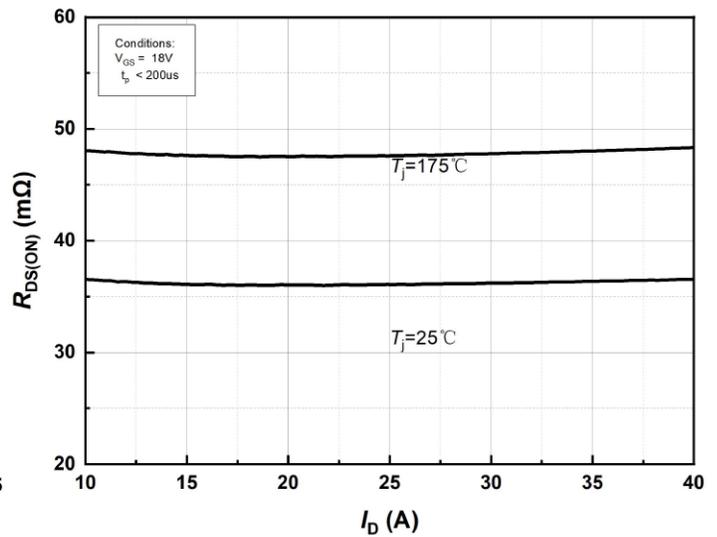


Figure 4. On-Resistance vs. Drain current for Various Temperature

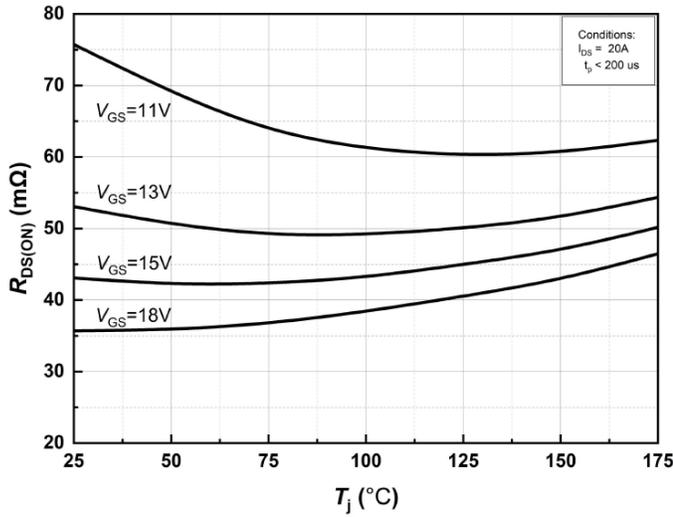


Figure 5. On-Resistance vs. Temperature for Various Gate Voltage

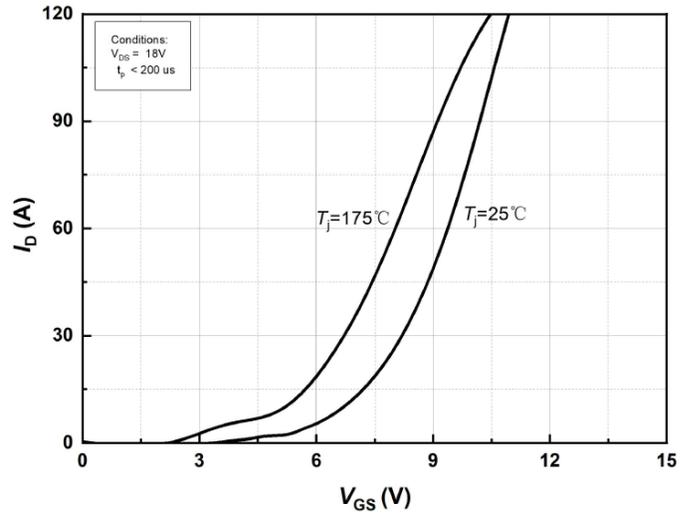


Figure 6. Transfer Characteristics for Various Junction Temperatures

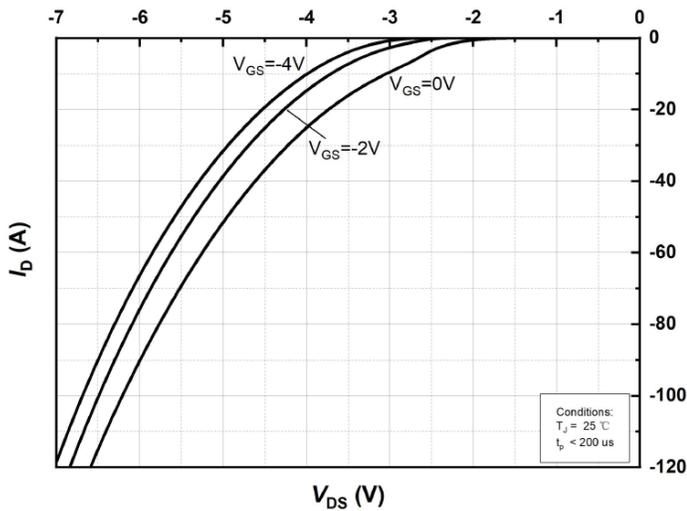


Figure 7. Body Diode Characteristics at T_j=25°C

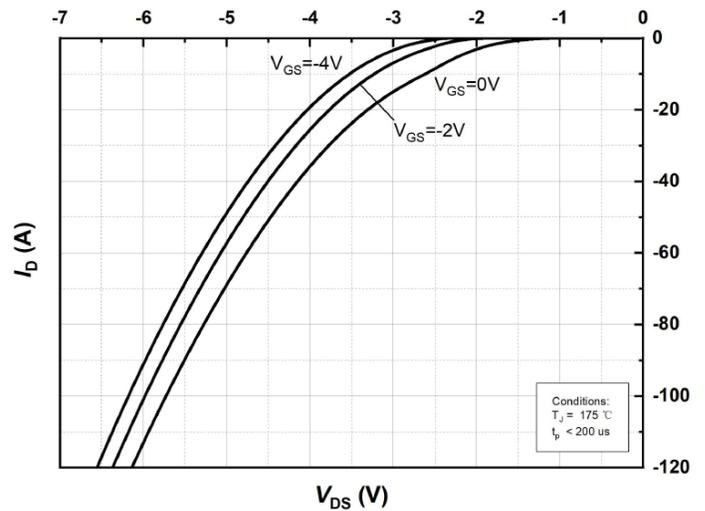


Figure 8. Body Diode Characteristics at T_j=175°C

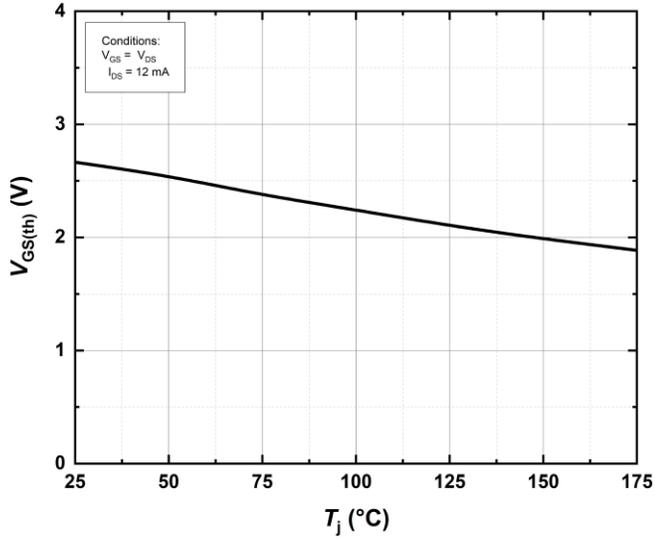


Figure 9. Threshold Voltage vs. Temperature

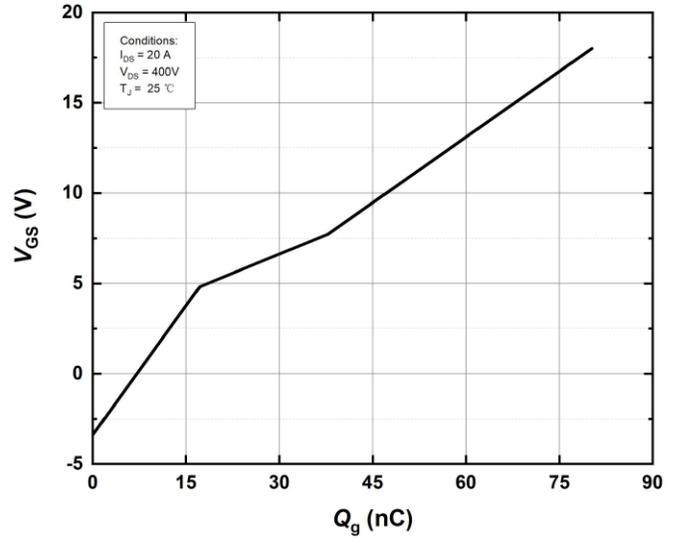


Figure 10 Gate Charge Characteristics

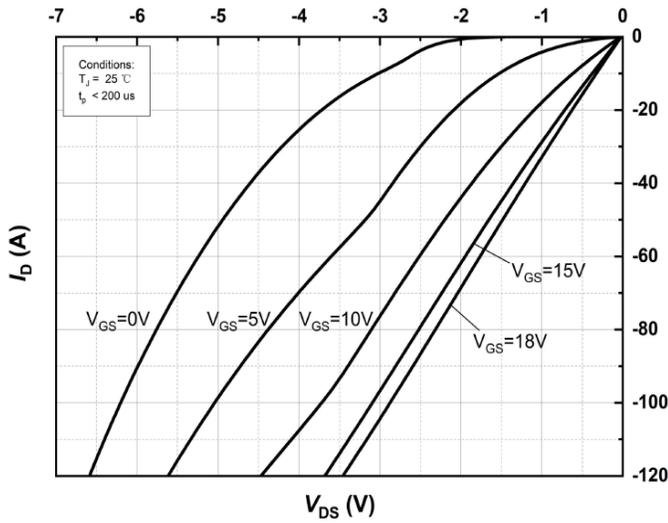


Figure 11. 3rd Quadrant Characteristic at $T_j=25^\circ\text{C}$

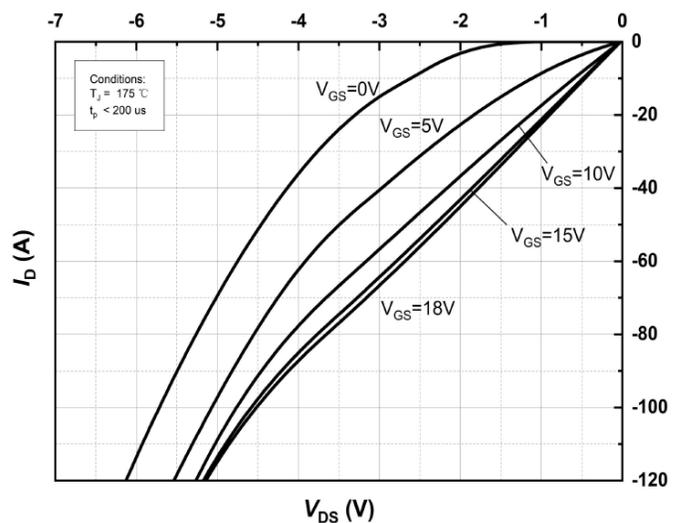


Figure 12. 3rd Quadrant Characteristic at $T_j=175^\circ\text{C}$

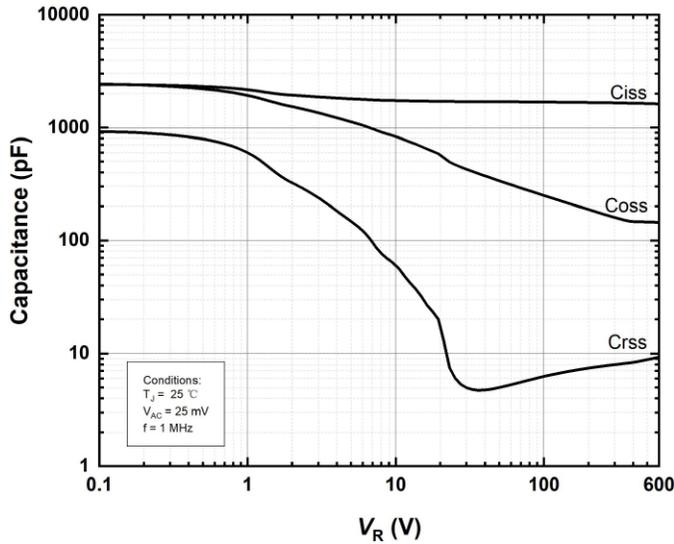


Figure 13. Capacitances vs. Drain-Source Voltage (0 – 600V)

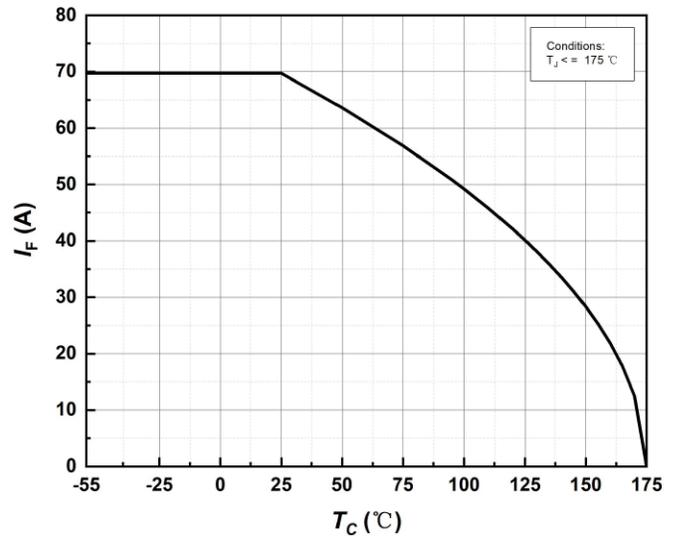


Figure 14. Continuous Drain Current Derating vs Case Temperature

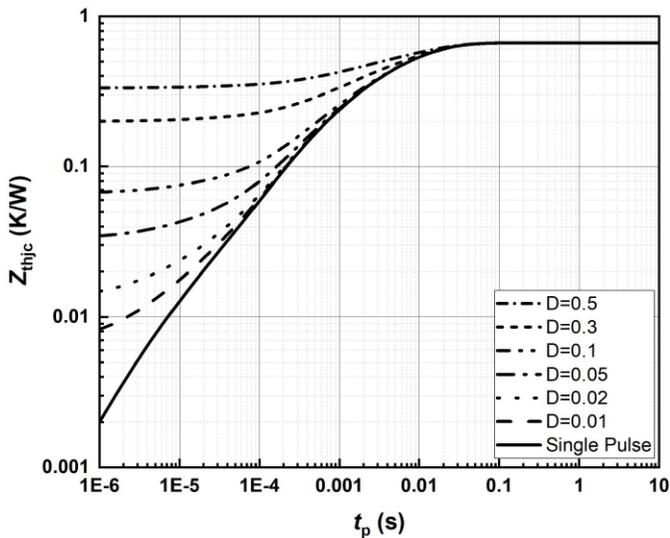


Figure 15. Transient Thermal Impedance (Junction – Case)

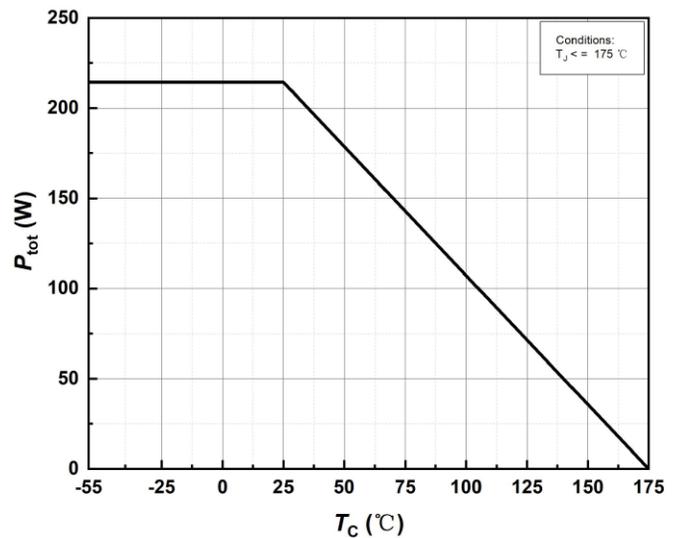


Figure 16. Maximum Power Dissipation Derating vs. Case Temperature

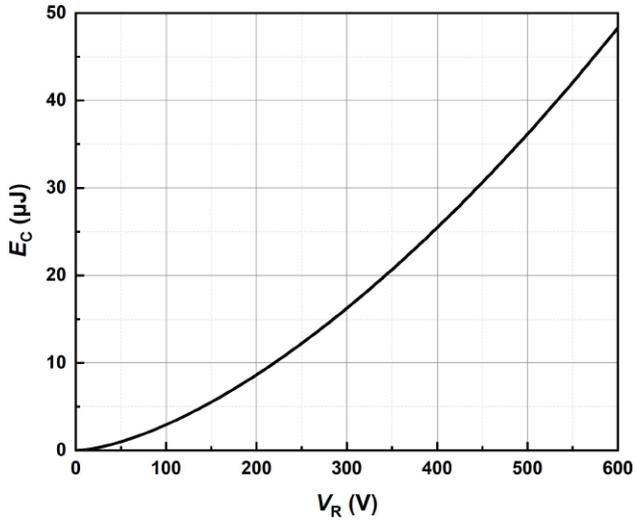


Figure 17. Output Capacitor Stored Energy

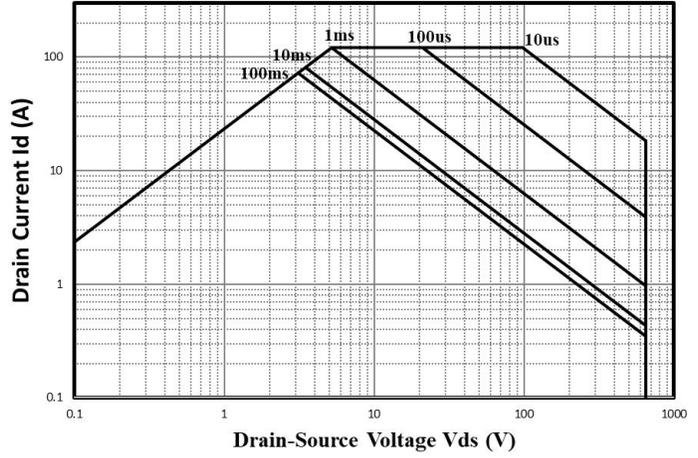
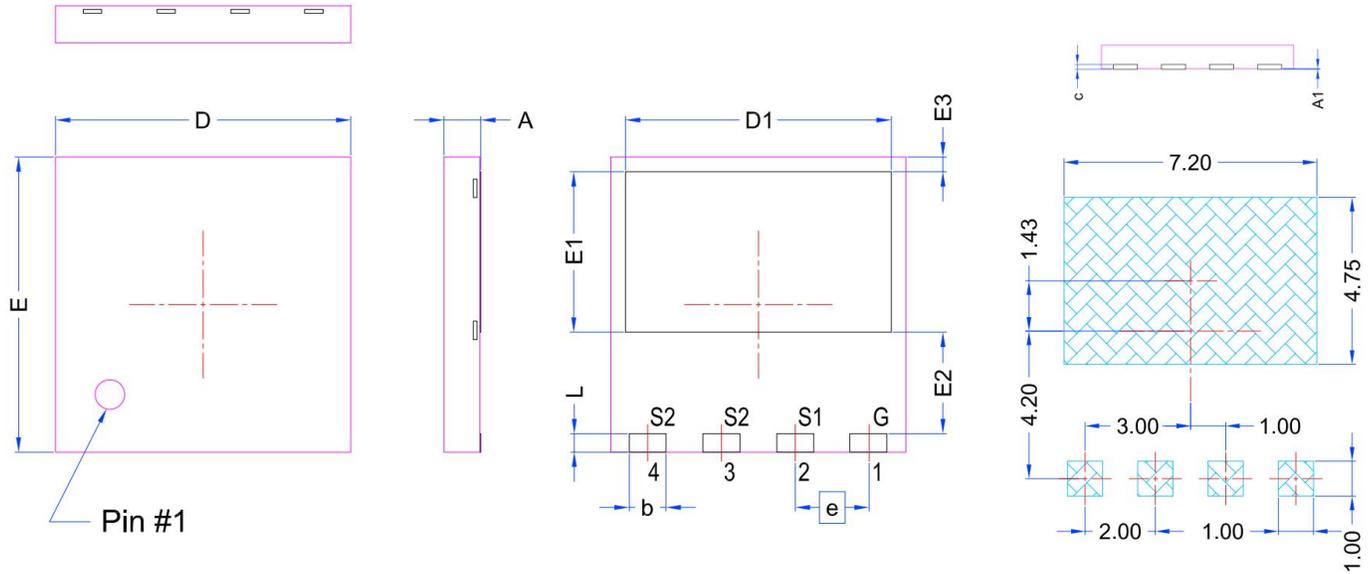


Figure 18. Safe Operating Area



Package Dimensions

Package DFN8X8B



SYMBOL	DIMENSIONS		
	MIN.	NOM.	MAX.
A	0.90	1.00	1.10
A1	0.00	—	0.05
b	0.90	1.00	1.10
c	0.10	0.20	0.30
D	7.90	8.00	8.10
D1	7.10	7.20	7.30
E	7.90	8.00	8.10
E1	4.25	4.35	4.45
E2	2.65	2.75	2.85
E3	0.30	0.40	0.50
e	2.00 BSC		
L	0.40	0.50	0.60



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