



### Features

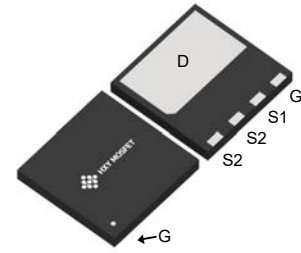
- Wide bandgap SiC MOSFET technology
- Low On-Resistance with High Blocking Voltage
- Low Capacitances with High-Speed switching
- Low reverse recovery(Qrr)
- Halogen free, RoHs compliant

### Benefits

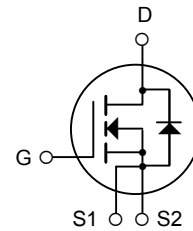
- Reduce switching losses
- Increased system Switching Frequency
- Increased power density
- Reduction of heat sink requirements

### Applications

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



DFN8X8B



Ordering Part Number	Package	Brand
SCTL35N65G2V	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	$V_{GS} = 0V, I_D = 100\mu A$	650	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	$V_{GS} = 18V, T_C = 25^\circ\text{C}$	68	A	Fig. 14
		$V_{GS} = 18V, T_C = 100^\circ\text{C}$	48		
$I_{D,pulse}$	Pulsed Drain Current	Pulse with $t_p$ limited by $T_{jmax}$ at 1 ms	96	A	
		Pulse with $t_p$ limited by $T_{jmax}$ at 100 $\mu s$	174		
$P_D$	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	$^\circ\text{C}$	
$T_{stg}$	Storage temperature		-55~175	$^\circ\text{C}$	



### 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<sub>c</sub> = 25°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	$V_{GS} = V_{DS}, I_D = 5mA$		2.7		V	Fig. 9
		$V_{GS} = V_{DS}, I_D = 5mA, T_j = 175^\circ C$		1.8			
$I_{GSS}$	Gate-Source Leakage current	$V_{GS} = 20V, V_{DS} = 0V$			250	nA	
$I_{DSS}$	Zero Gate Voltage Drain Current	$V_{DS} = 650V, V_{GS} = 0V, T_j = 25^\circ C$		1	50	$\mu A$	
$R_{DS(on)}$	Drain-Source On-state Resistance	$V_{GS} = 20V, I_D = 20A$		45	58	m $\Omega$	Fig. 3, 4, 5
		$V_{GS} = 20V, I_D = 20A, T_j = 175^\circ C$		60			
$g_{fs}$	Transconductance	$V_{DS} = 20V, I_D = 20A$		18		S	Fig. 6
		$V_{DS} = 20V, I_D = 20A, T_j = 175^\circ C$		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	$V_{GS} = 0V, V_{DS} = 600V$ $f = 1\text{ MHz}$ $V_{AC} = 25mV$		1410		pF	Fig. 13	
$C_{oss}$	Output Capacitance			119				pF
$C_{rss}$	Reverse Transfer Capacitance			4				pF
$R_{G(int)}$	Internal Gate Resistance	$f = 1\text{ MHz}, V_{AC} = 25mV$		1.8		$\Omega$		

### 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

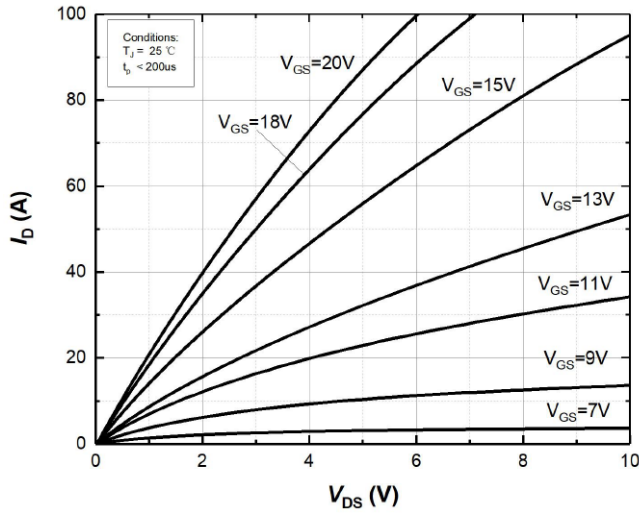


Figure 1. Output characteristics at  $T_j=25^\circ\text{C}$

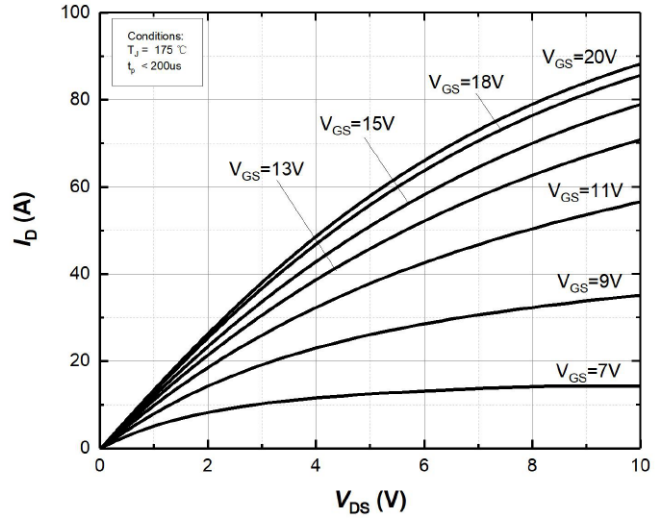


Figure 2. Output characteristics at  $T_j=175^\circ\text{C}$

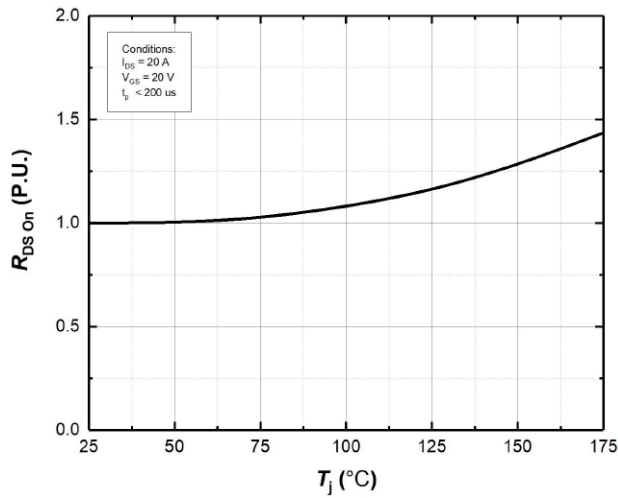


Figure 3. Normalized On-Resistance vs. Temperature

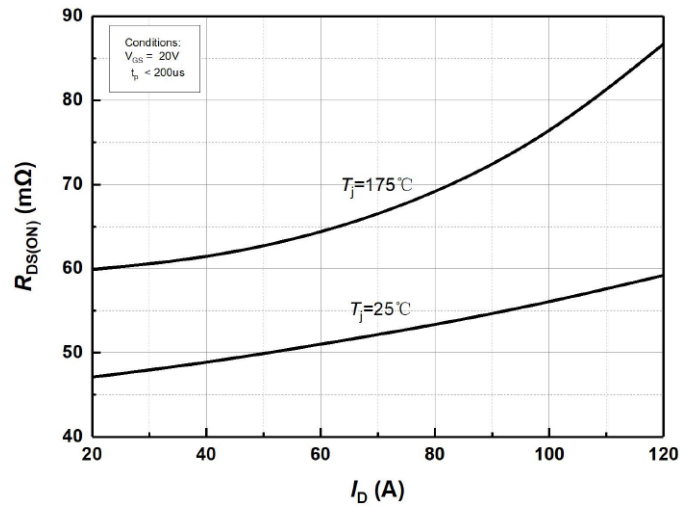


Figure 4. On-Resistance vs. Drain current for Various Temperature

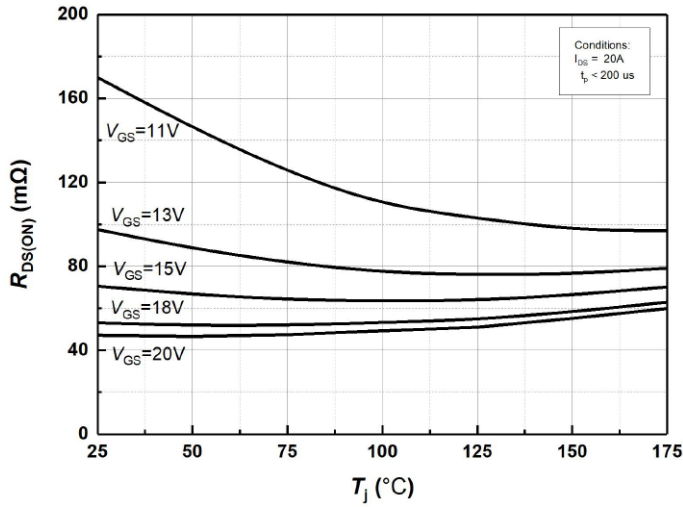


Figure 5. On-Resistance vs. Temperature for Various Gate Voltage

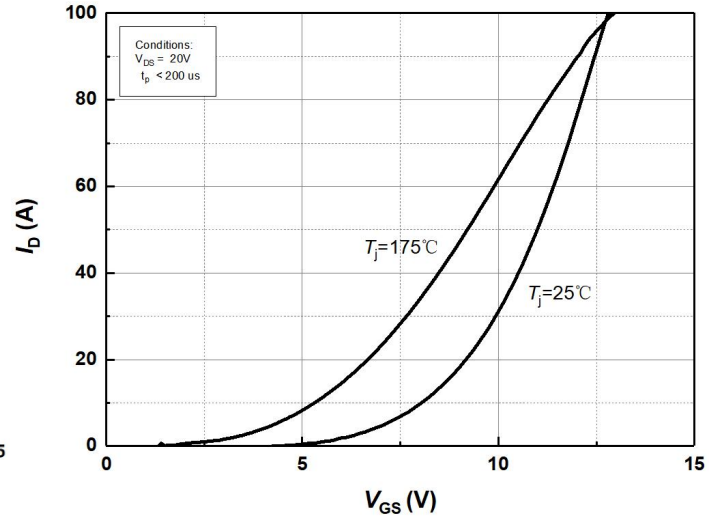


Figure 6. Transfer Characteristics for Various Junction Temperatures

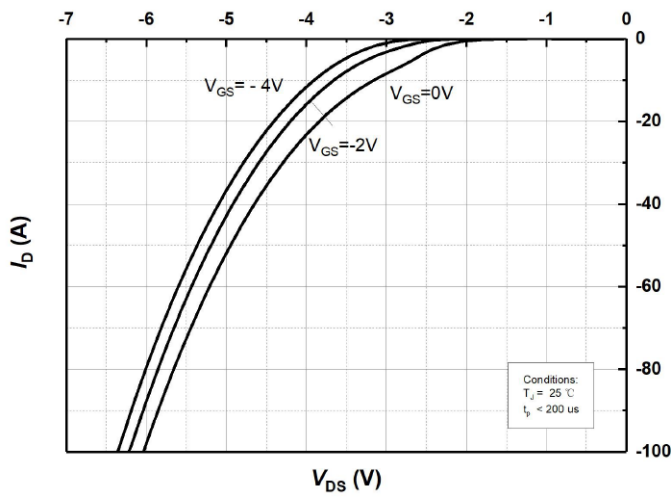


Figure 7. Body Diode Characteristics at T<sub>J</sub>=25°C

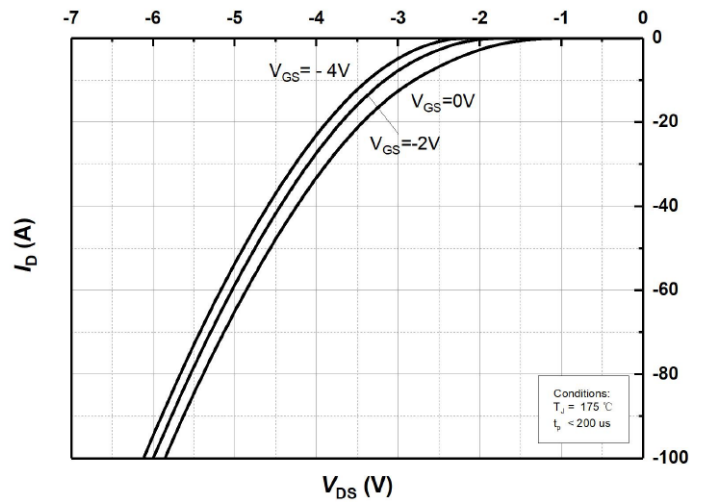


Figure 8. Body Diode Characteristics at T<sub>J</sub>=175°C

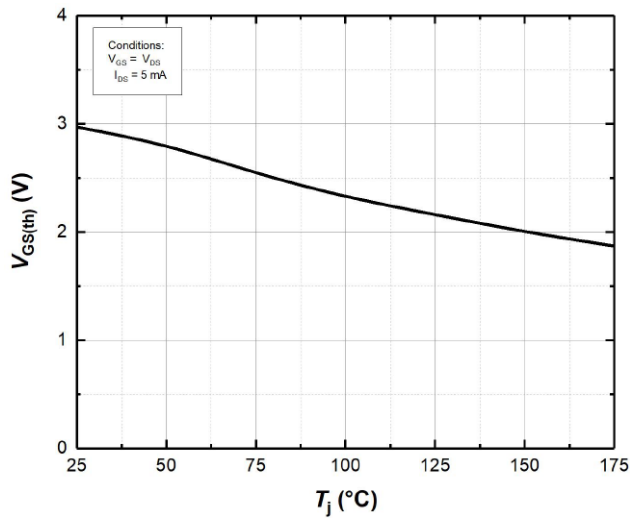


Figure 9. Threshold Voltage vs. Temperature

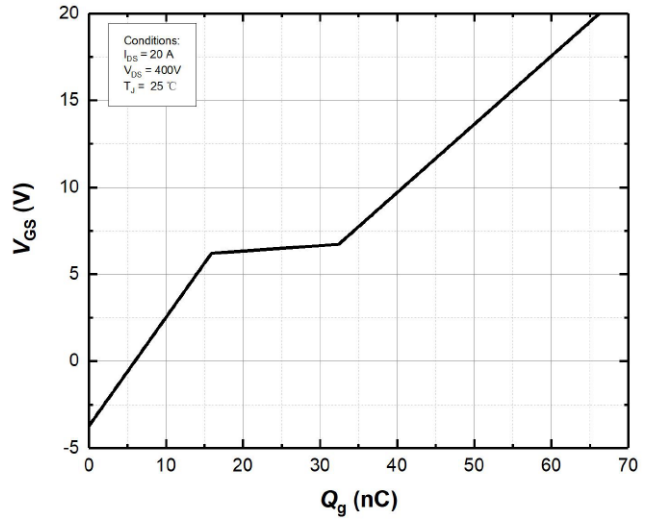


Figure 10 Gate Charge Characteristics

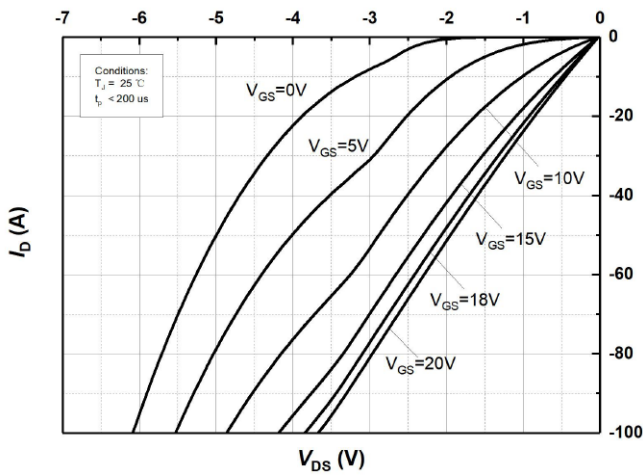


Figure 11. 3rd Quadrant Characteristic at  $T_j=25^\circ\text{C}$

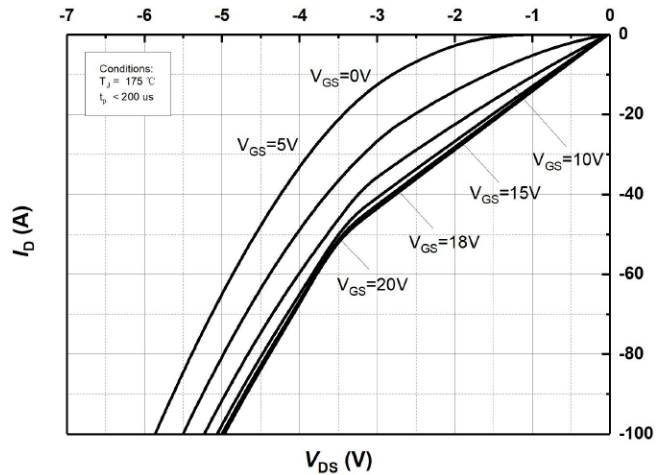


Figure 12. 3rd Quadrant Characteristic at  $T_j=175^\circ\text{C}$

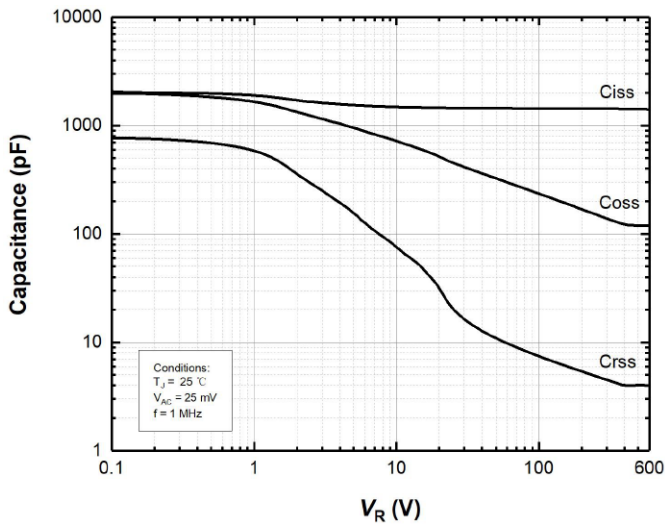


Figure 13. Capacitances vs. Drain-Source Voltage (0 – 600V)

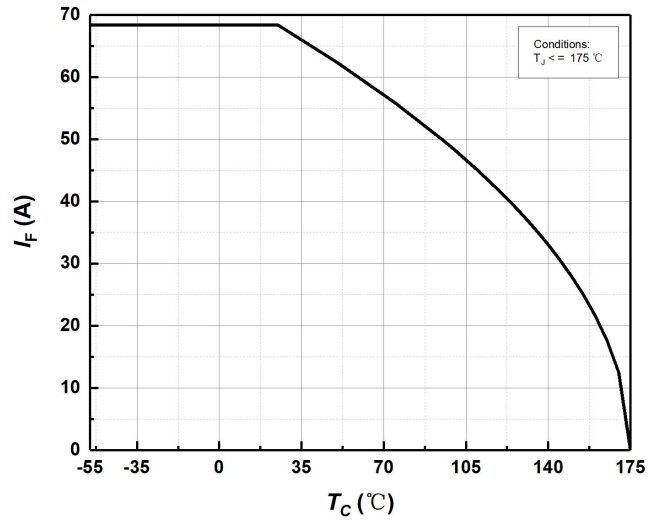


Figure 14. Continuous Drain Current Derating vs Case Temperature

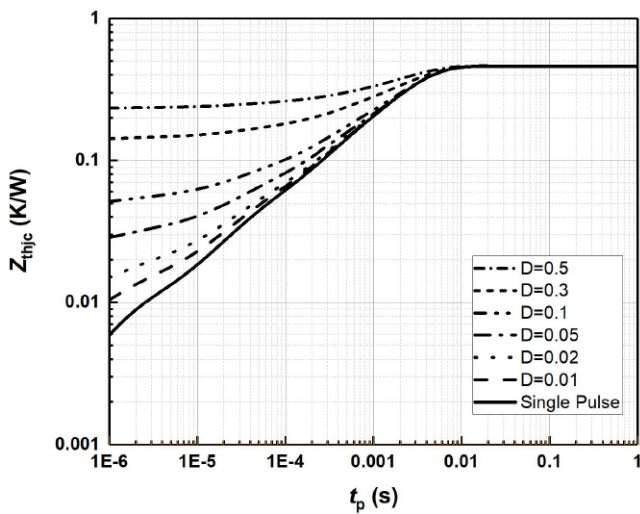


Figure 15. Transient Thermal Impedance (Junction – Case)

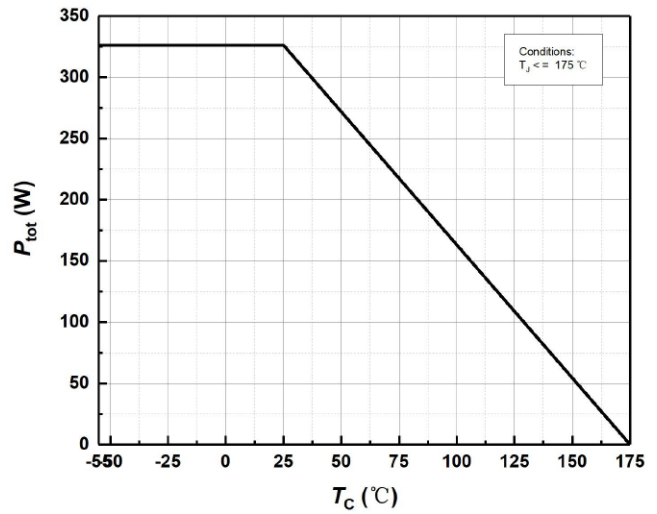


Figure 16. Maximum Power Dissipation Derating vs. Case Temperature

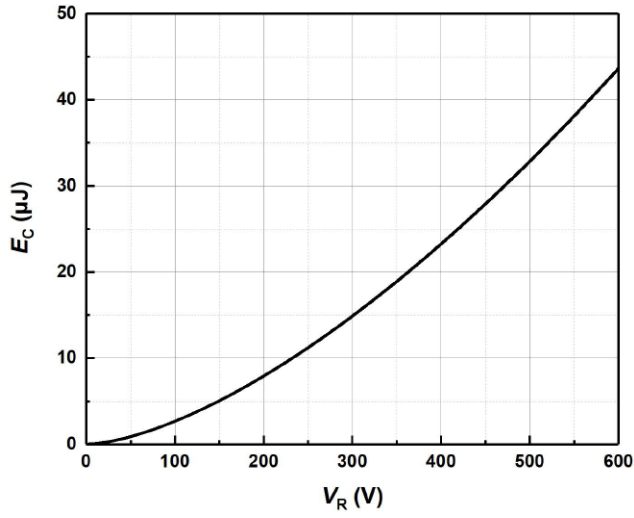


Figure 17. Output Capacitor Stored Energy

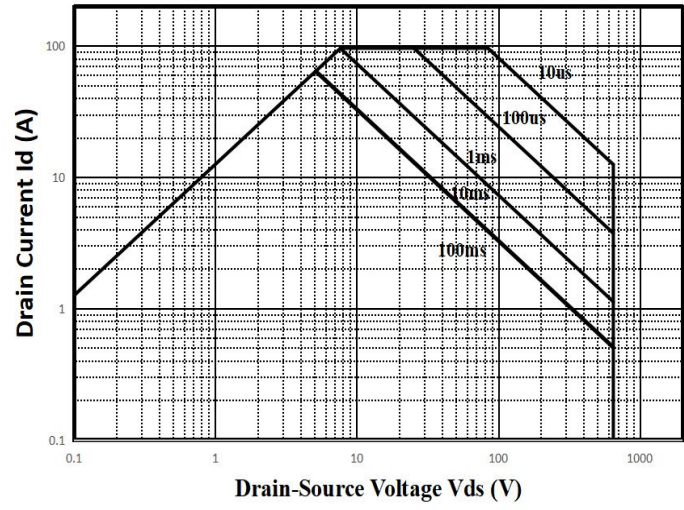
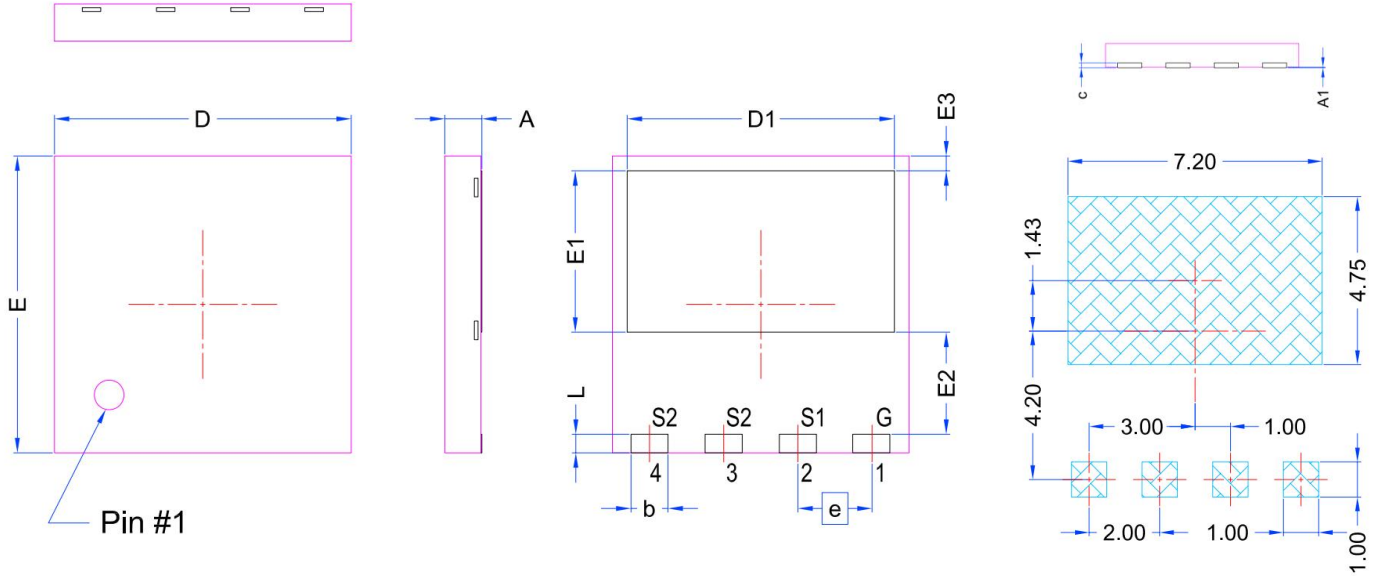


Figure 18. Safe Operating Area



## 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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