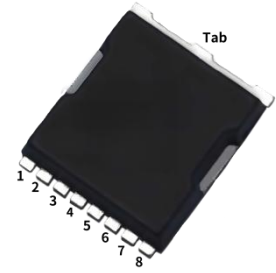
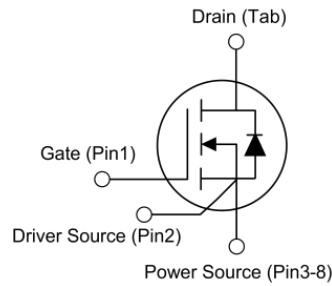


Silicon Carbide Power MOSFET

Parameter	Value	Unit
V_{DS}	1200	V
I_D	60	A
$R_{DS(ON)}$	45	m Ω
Q_G	125	nC



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Features

- High Speed Switching with Low Capacitances
- High Blocking Voltage with Low $R_{DS(on)}$
- Low impedance package with driver source pin
- Easy to parallel and simple to drive

Applications

- EV Charging
- High Voltage DC/DC Converters
- Switched-Mode Power Supply(SMPS)
- Power Factor Correction(PFC)

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

Parameter	Symbol	Value	Unit
Drain-source Voltage	V_{DS}	1200	V
Gate-source Voltage	V_{GS}	-10/+22	V
Drain Current (continuous; $T_c=25^\circ\text{C}$)	I_D	60	A
Drain Current (continuous; $T_c=100^\circ\text{C}$)		48	
Drain Current (pulsed)	I_{DM}	100	A
Power Dissipation ($T_c=25^\circ\text{C}$)	P_D	218	W
Operating Junction and Storage Temperature Range	T_J, T_{stg}	-55 to +175	$^\circ\text{C}$
Thermal Resistance from Junction to Case	$R_{\theta JC}$	0.69	$^\circ\text{C/W}$
Thermal Resistance From Junction to Ambient	$R_{\theta JA}$	62	

Electrical Characteristics

Parameter	Symbol	Conditions	Value			Unit
			Min.	Typ.	Max.	
Static characteristics (at $T_C=25^\circ\text{C}$ unless otherwise specified)						
Drain-Source Breakdown Voltage	BV_{DS}	$V_{GS}=0V; I_D=250\mu\text{A}$	1200	-	-	V
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS}=1200V; V_{GS}=0V$	-	-	100	μA
Gate-Body Leakage Current	I_{GSS}	$V_{GS}=-10/+20V; V_{DS}=0V$	-	-	250	nA
Gate Threshold Voltage	$V_{GS(th)}$	$V_{GS}=V_{DS}; I_{DS}=10\text{mA}$	2	3	4	V
Recommended Turn-on Voltage	$V_{GS(on)}$	Static	-	18	-	V
Recommended Turn-off Voltage	$V_{GS(off)}$		-	-5	-	V
Static Drain-Source on Resistance	$R_{DS(on)}$	$V_{GS}=18V; I_D=20\text{A}$	-	45	52	m Ω
		$V_{GS}=18V; I_D=20\text{A}; T_J=175^\circ\text{C}$	-	81	-	
Dynamic characteristics (at $T_C=25^\circ\text{C}$ unless otherwise specified)						
Input Capacitance	C_{iss}	$V_{DS}=1000V; f=100\text{KHz}; V_{AC}=25\text{mV}$	-	2565	-	pF
Output Capacitance	C_{oss}		-	109	-	
Reverse Transfer Capacitance	C_{rss}		-	4	-	
Transconductance	g_{fs}	$V_{DS}=20V; I_D=20\text{A}$	-	24	-	S
C_{OSS} Stored Energy	E_{OSS}	$V_{DS}=1000V; f=100\text{KHz}$	-	63	-	μJ
Turn-on Energy	E_{on}	$V_{DS}=800V; V_{GS}=-5/+18V; I_D=20\text{A}; R_{g(ext)}=2.5\Omega; \text{Load}=100\mu\text{H}; T_J=175^\circ\text{C}$	-	556	-	μJ
Turn-off Energy	E_{off}		-	93	-	
Total Gate Charge	Q_G	$V_{DS}=800V; V_{GS}=-5/+18V; I_D=20\text{A}$	-	125	-	nC
Gate-Source Charge	Q_{GS}		-	32	-	
Gate-Drain Charge	Q_{GD}		-	33	-	
Internal Gate Resistor	R_{Gint}	$f=1\text{MHz}; V_{AC}=25\text{mV}$	-	4.2	-	Ω
Turn-on Delay Time	$t_{d(on)}$	$V_{DS}=800V; V_{GS}=-5/+18V; I_D=20\text{A}; R_{g(ext)}=2.5\Omega; \text{Load}=100\mu\text{H}$	-	13	-	ns
Rise Time	t_r		-	17	-	
Turn-off Delay Time	$t_{d(off)}$		-	23	-	
Fall Time	t_f		-	9	-	

Reverse SiC Diode Characteristics (at $T_J=25^\circ\text{C}$ unless otherwise specified)

Parameter	Symbol	Conditions	Values			Units
			Min.	Typ.	Max.	
Diode Forward Voltage	V_{FSD}	$V_{GS}=0V; I_F=20\text{A}$	-	4.2	6	V
		$V_{GS}=0V; I_F=20\text{A}; T_J=175^\circ\text{C}$	-	3.5	6	
Continuous Diode Forward Current	I_S	$V_{GS}=0V; T_C=25^\circ\text{C}$	-	55	-	A
Reverse Recovery Time	t_{RR}	$V_R=800V; V_{GS}=-5V; I_F=20\text{A}; di/dt=900\text{A}/\mu\text{s}; T_J=175^\circ\text{C}$	-	50	-	ns
Reverse Recovery Charge	Q_{RR}		-	712	-	nC
Peak Reverse Recovery Current	I_{RRM}		-	19	-	A

Typical Characteristics

Fig1. Output characteristics ($T_J = 25^\circ\text{C}$)

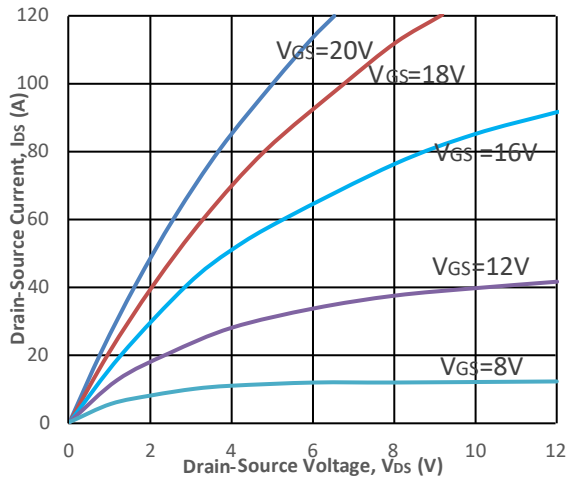


Fig2. Output characteristics ($T_J = 175^\circ\text{C}$)

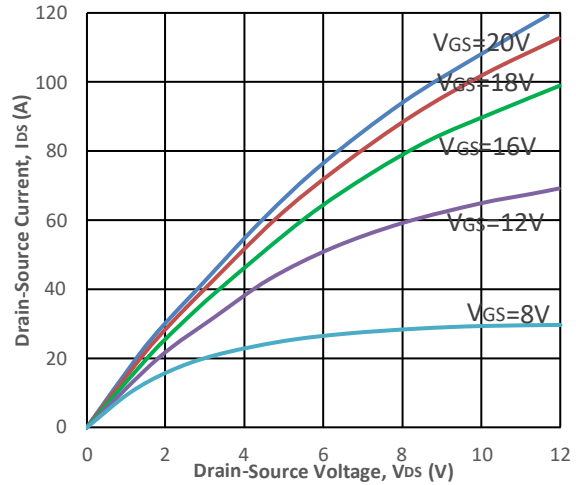


Fig3. Normalized On-Resistance vs. Temperature

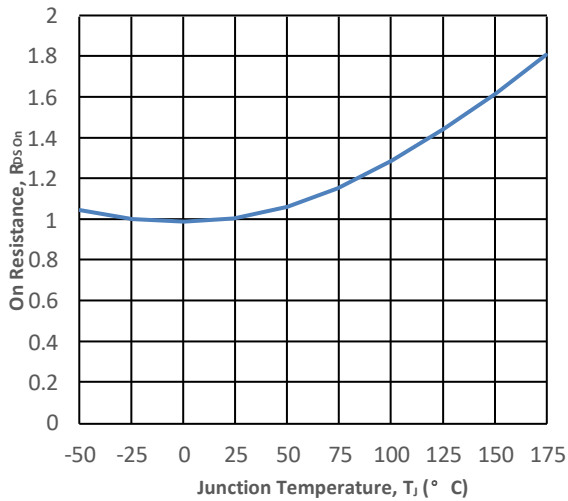


Fig4. On-Resistance vs. Temperature

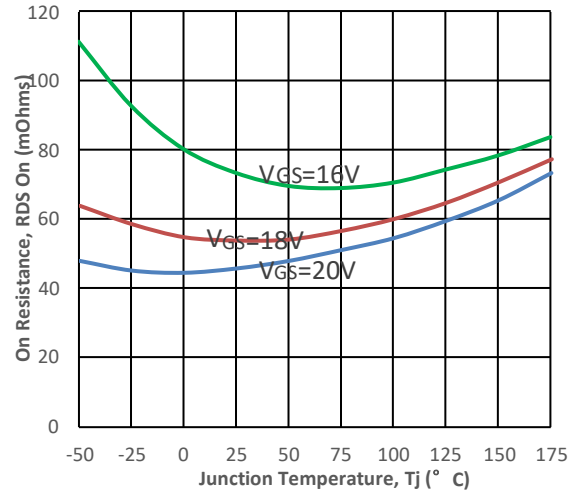


Fig5. Transfer Characteristic

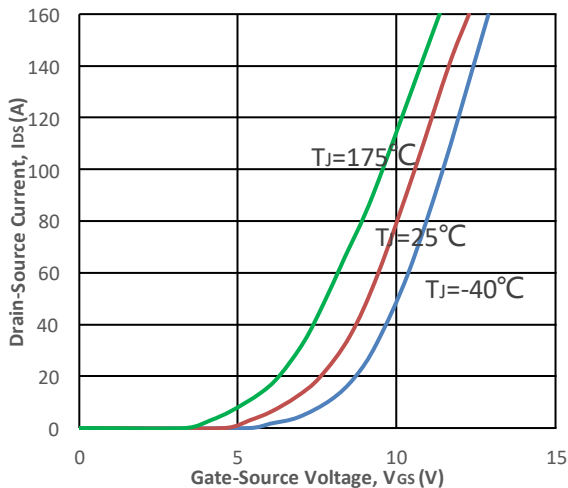


Fig6. Body Diode Characteristic at 25°C

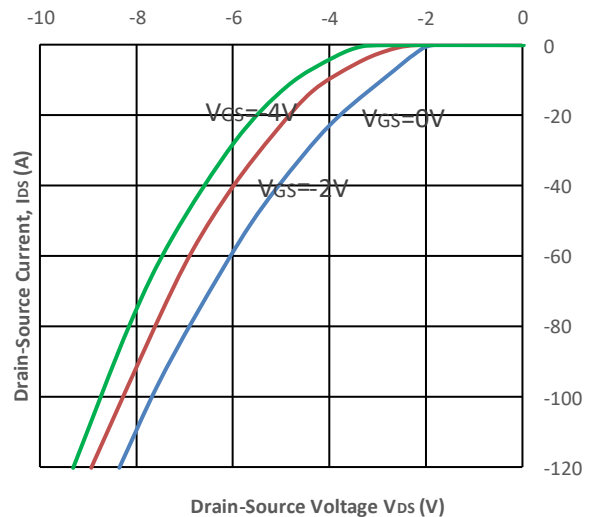


Fig7. Threshold Voltage vs. Temperature

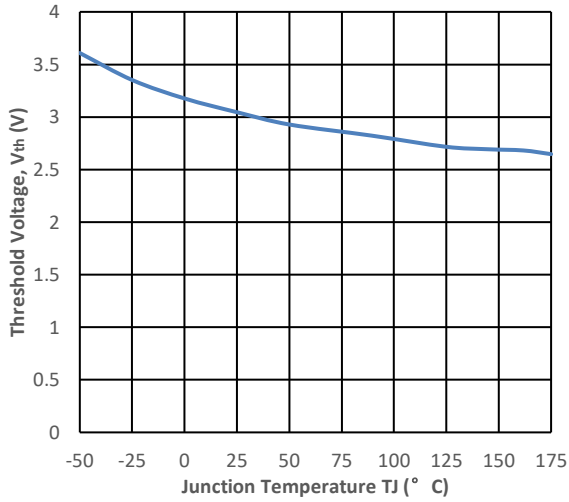


Fig8. Gate Charge Characteristics

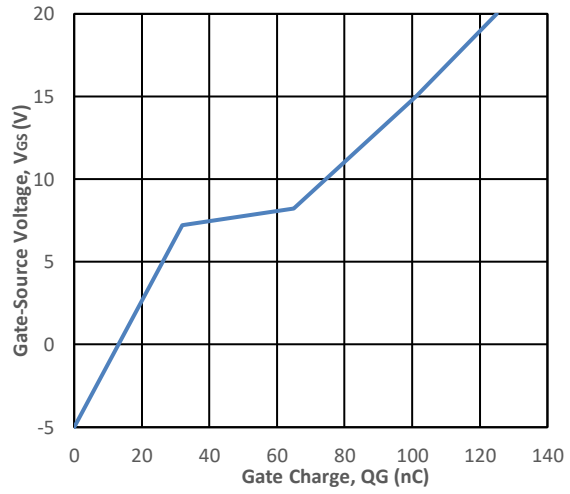


Fig9. 3rd Quadrant Characteristic at 25 °C

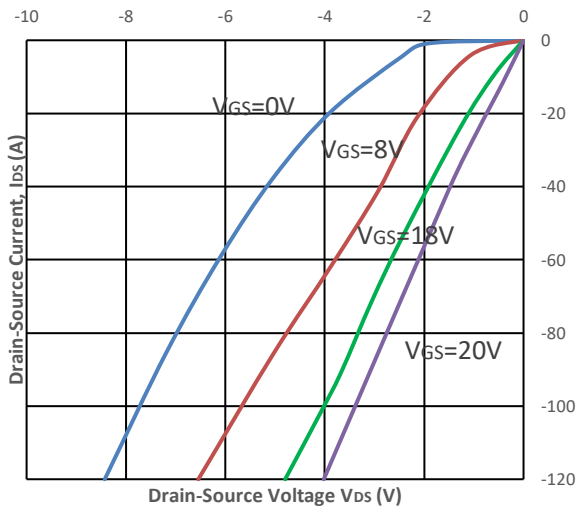


Fig10. Output Capacitor Stored Energy

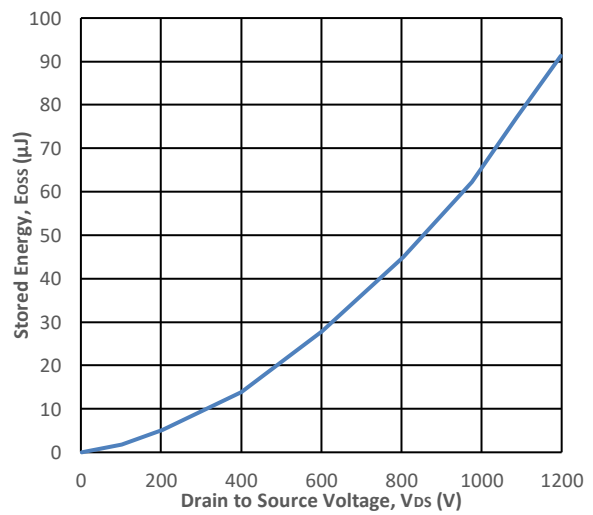


Fig11. Capacitances vs. Drain-Source

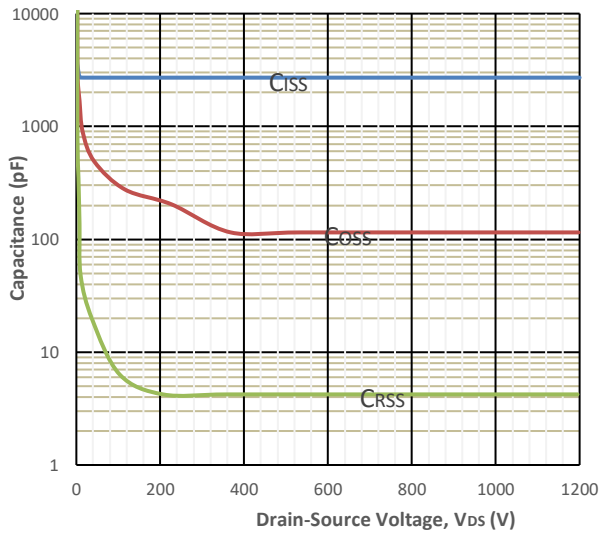


Fig12. Max Power Dissipation Derating Vs Tc

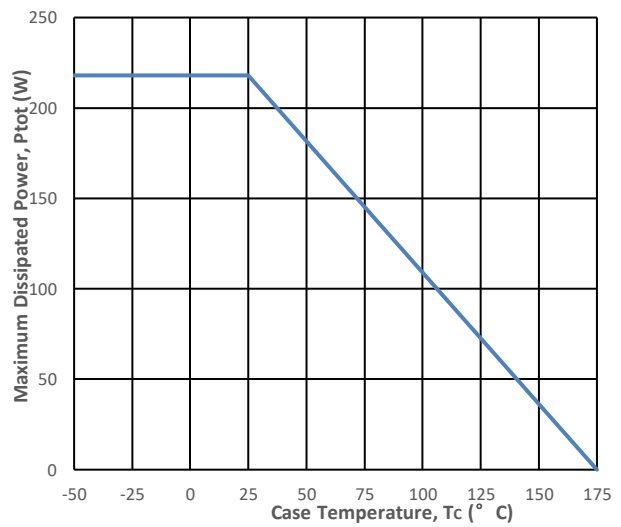


Fig13. Switching Energy vs. Drain Current

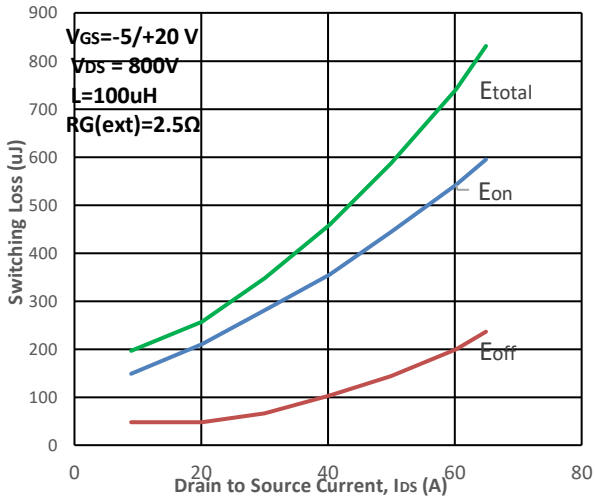


Fig14. Switching Energy vs. $R_{G(\text{ext})}$

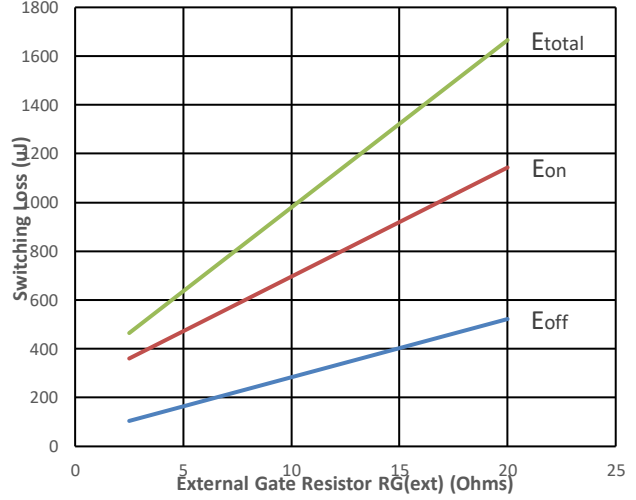


Fig15. Switching Energy vs. Temperature

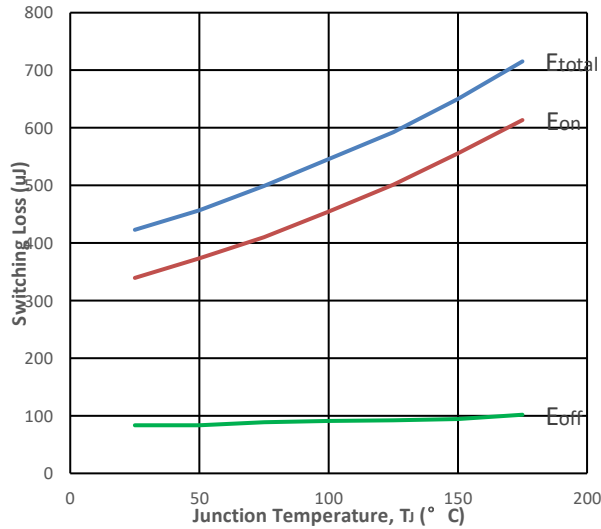


Fig16. Switching Times vs. $R_{G(\text{ext})}$

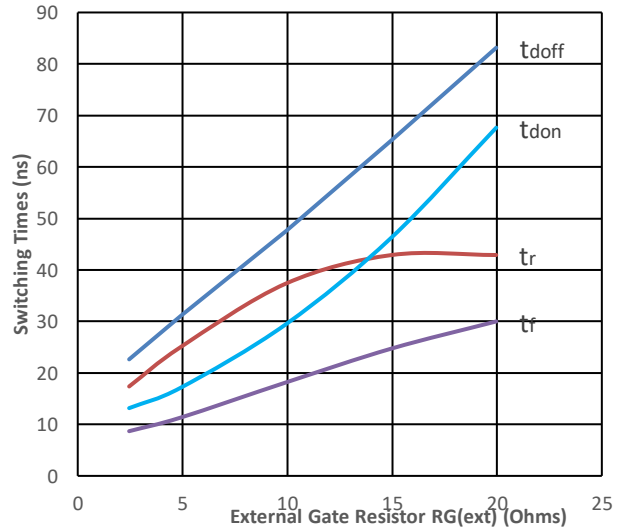


Fig17. Transient Thermal Impedance

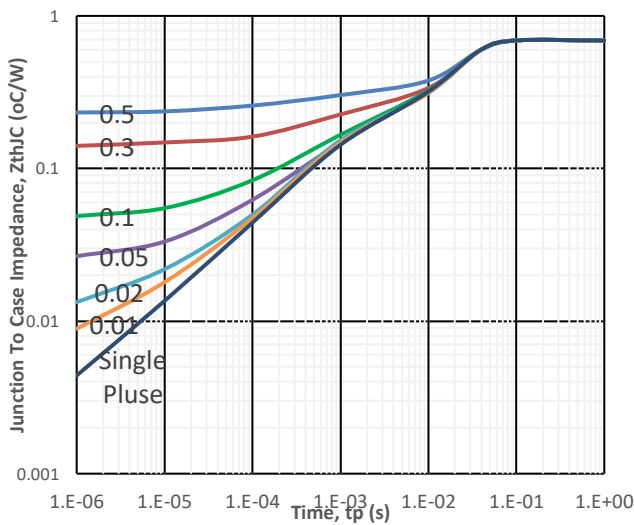
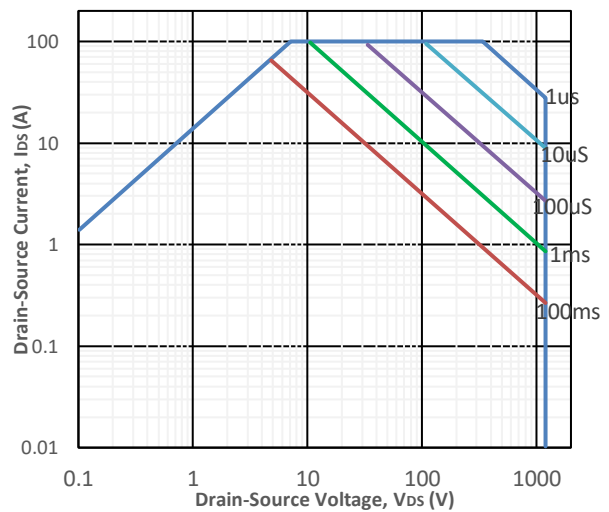
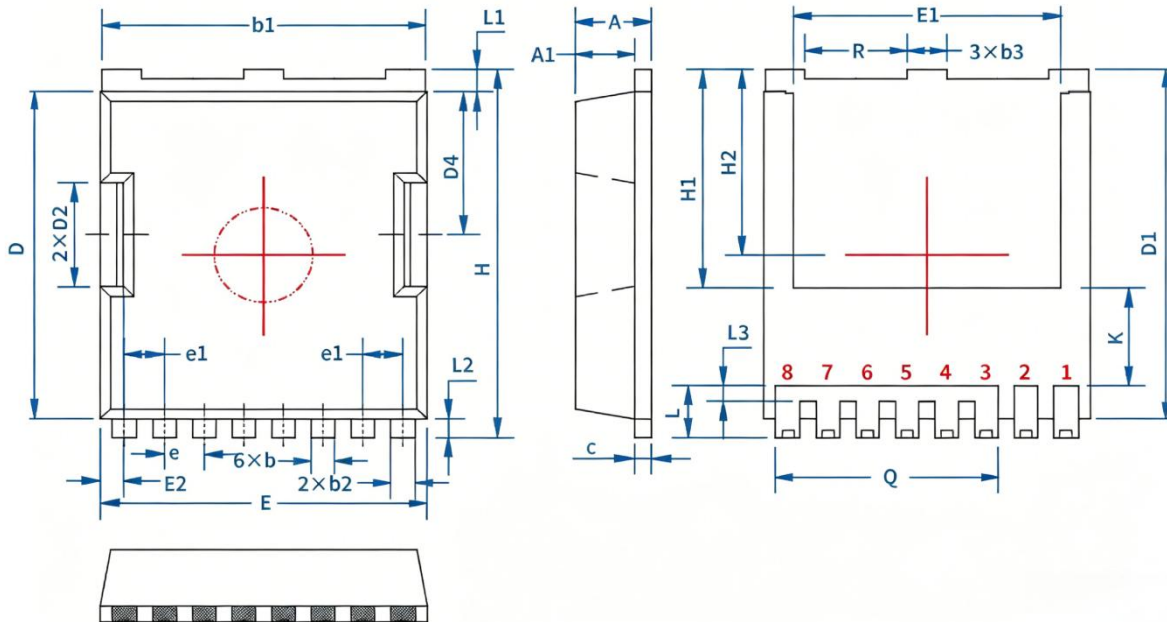


Fig18. Safe Operating Area



Package Outlines(Unit:mm)

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Symbol	Millimeters			Symbol	Millimeters		
	Min.	Type.	Max.		Min.	Type.	Max.
A	2.25	2.30	2.35	E	9.85	9.90	9.95
A1	1.75	1.80	1.85	E1	8.00	8.10	8.20
b	0.65	0.70	0.75	E2	0.65	0.70	0.75
b1	9.75	9.80	9.90	H	11.60	11.70	11.80
b2	0.70	0.75	0.80	H1	6.95 BSC		
b3	1.15	1.20	1.25	H2	5.90 BSC		
C	0.45	0.50	0.55	K	3.10 REF		
D	10.35	10.40	10.45	L	1.55	1.65	1.75
D1	11.00	11.10	11.20	L1	0.65	0.70	0.75
D2	3.25	3.30	3.35	L2	0.50	0.60	0.70
D4	4.50	4.55	4.60	L3	0.40	0.50	0.60
e	1.20 BSC			Q	6.75 REF		
e1	1.225 BSC			R	3.00	3.10	3.20

Pin	Symbol	Description
1	G	Gate
2	KS	Driver Source
3-8	S	Power Source
Tab	D	Drain

Note:

1. All metal surfaces are Sn plated (matte), except area of cut.
2. Burr or mold flash size (0.5 mm) is not included in the dimensions.

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