

**SiC MOSFET**
**SiC N-Channel Planar Power MOSFET**
**General Features**

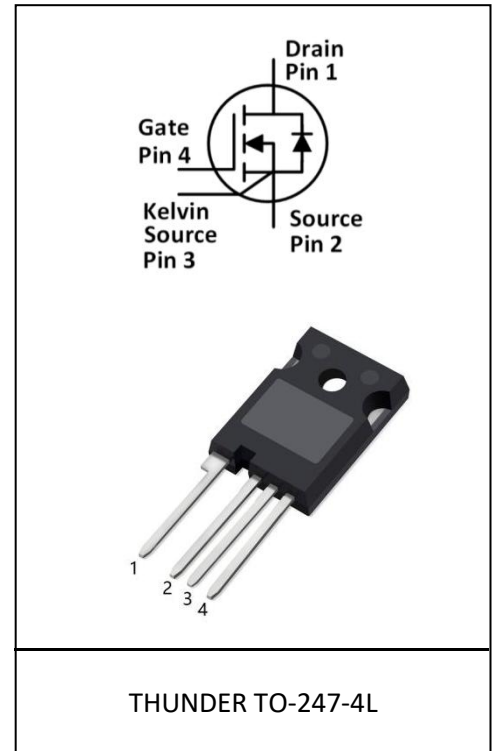
- $V_{DS}=1200V, I_D=150A$
- Low ON Resistance,  $R_{DS(ON)}=16m\Omega @ V_{GS}=18V, I_D=75A$
- Low reverse transfer capacitance
- Low Qg for fast response
- Short fall & rise times for fast switching
- 100% single pulse avalanche energy Test

**Benefits**

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

**Application**

- Power switching application
- Digital amplifier
- Adapter and charger


**Product Summary**

$V_{DS}$	1200V
$R_{DS(on)}$	16m $\Omega$
$I_D$	150A

**Absolute Maximum Ratings**

Parameter	Symbol	Value	Unit
Drain-source voltage	$V_{DS}$	1200	V
Continuous drain current	$I_D^*$	150	A
$T_C = 25^\circ C$		100	
$T_C = 100^\circ C$			
Pulsed drain current ( $T_C = 25^\circ C$ , $t_p$ limited by $T_{jmax}$ )	$I_{DM}^*$	250	A
Gate-Source voltage	$V_{GSmax}$	-8/+22	V
Recommend Gate-Source Voltage	$V_{GSop}$	-4/+18	V
Operating junction and storage temperature	$T_j, T_{stg}$	-40...+150	$^\circ C$

\* Verified by design

**Electrical Characteristic** (at  $T_j = 25^\circ\text{C}$ , unless otherwise specified)

Parameter	Symbol	Value			Unit	Test Condition
		min.	typ.	max.		

**Static Characteristic**

Drain-source breakdown voltage	$BV_{DSS}$	1200	-	-	V	$I_D = 100\mu\text{A}, V_{GS} = 0\text{V}$
Gate threshold voltage	$V_{GS(th)}$	2	2.4 1.8	4	V	$V_{DS} = V_{GS}, I_D = 22\text{mA}$ $T_j = 25^\circ\text{C}$ $T_j = 150^\circ\text{C}$
Zero gate voltage drain current	$I_{DSS}$	-	1 4	-	$\mu\text{A}$	$V_{DS} = 1200\text{V}, V_{GS} = 0\text{V}$ $T_j = 25^\circ\text{C}$ $T_j = 150^\circ\text{C}$
Gate-source leakage current	$I_{GSS}$	-	-	250	nA	$V_{DS} = 0\text{V}, V_{GS} = 18\text{V}$
Drain-source on-state resistance	$R_{DS(on)}$	-	16 20.2	-	m $\Omega$	$V_{GS} = 18\text{V}, I_D = 75\text{A}$ $T_j = 25^\circ\text{C}$ $T_j = 150^\circ\text{C}$

**Dynamic Characteristic**

Input Capacitance	$C_{iss}$	-	6650	-	pF	$V_{DS} = 1000\text{V},$ $f = 100\text{KHz},$ $V_{GS} = 0\text{V}$
Output Capacitance	$C_{oss}$	-	253	-		
Reverse Transfer Capacitance	$C_{rss}$	-	22	-		
Gate Total Charge	$Q_g$	-	280	-	nC	$V_{DS} = 800\text{V},$ $I_D = 75\text{A},$ $V_{GS} = -4/18\text{V}$
Gate-Source charge	$Q_{gs}$	-	83	-		
Gate-Drain charge	$Q_{gd}$	-	84	-		

**Body Diode Characteristic**

Parameter	Symbol	Value			Unit	Test Condition
		min.	typ.	max.		
Body Diode Forward Voltage	$V_{SD}$	-	4.9 4.2	-	V	$V_{GS} = -4V, I_{SD} = 37.5A$ $T_j = 25^\circ C$ $T_j = 150^\circ C$
Body Diode Continuous Forward Current	$I_S$	-	110 60	-	A	$V_{GS} = -4V$ $T_C = 25^\circ C$ $T_C = 100^\circ C$
Body Diode Reverse Recovery Time	$t_{rr}$	-	63	-	ns	$V_{GS} = -4V, I_{SD} = 75A,$ $V_R = 800V,$ $di/dt = 758A/\mu s$
Body Diode Reverse Recovery Charge	$Q_{rr}$	-	380	-	$\mu C$	
Peak Reverse Recovery Current	$I_{rm}$		25		A	

## Typical Performance

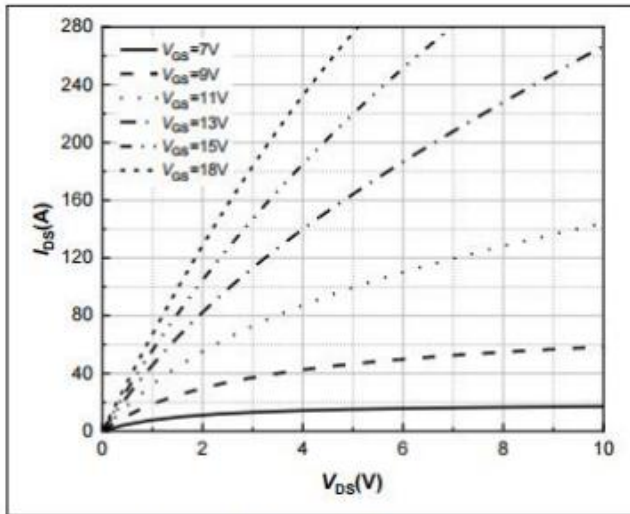


Figure 1. Output Characteristics  
 $T_j = 25^\circ\text{C}$

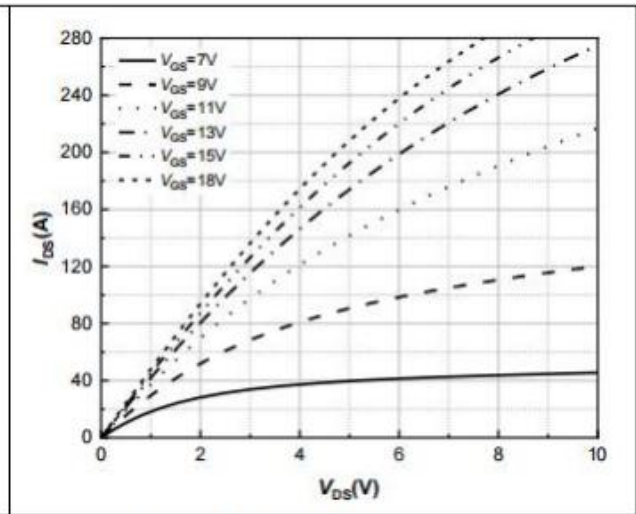


Figure 2. Output Characteristics  
 $T_j = 150^\circ\text{C}$

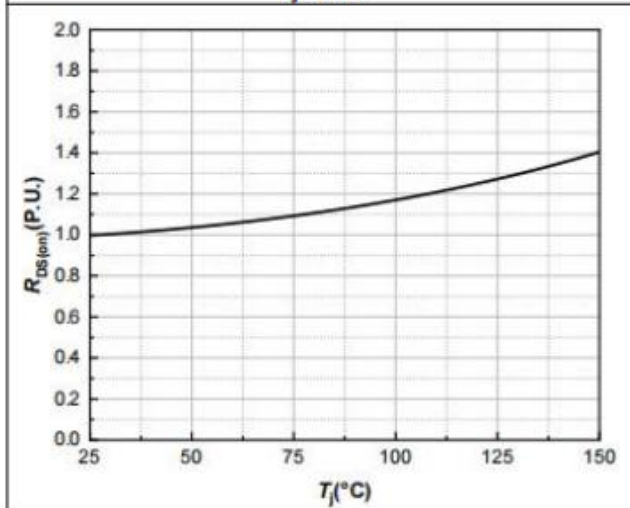


Figure 3. Normalized On-Resistance vs. Temperature

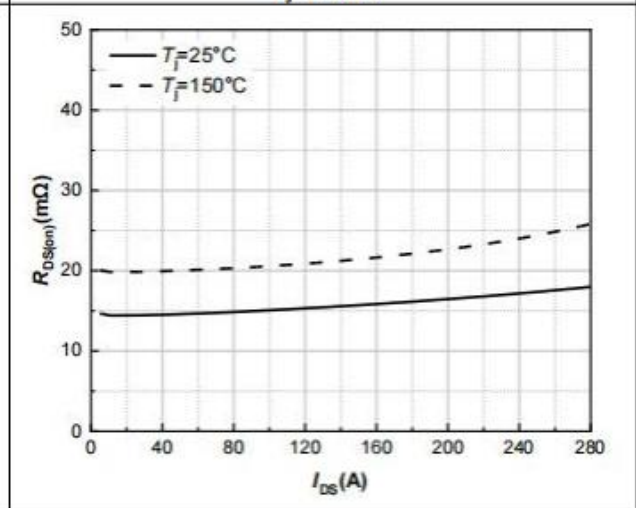


Figure 4. On-Resistance vs. Drain Current For Various Temperatures

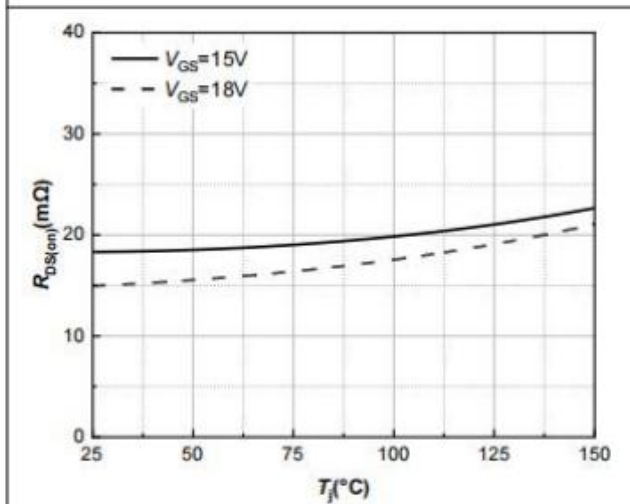


Figure 5. On-Resistance vs. Temperature For Various Gate Voltage

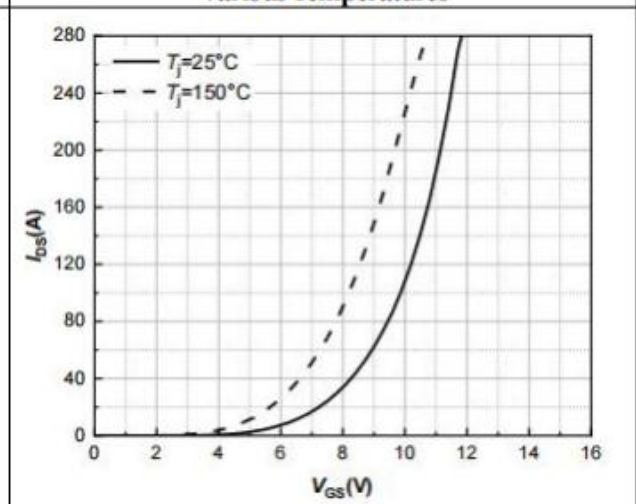
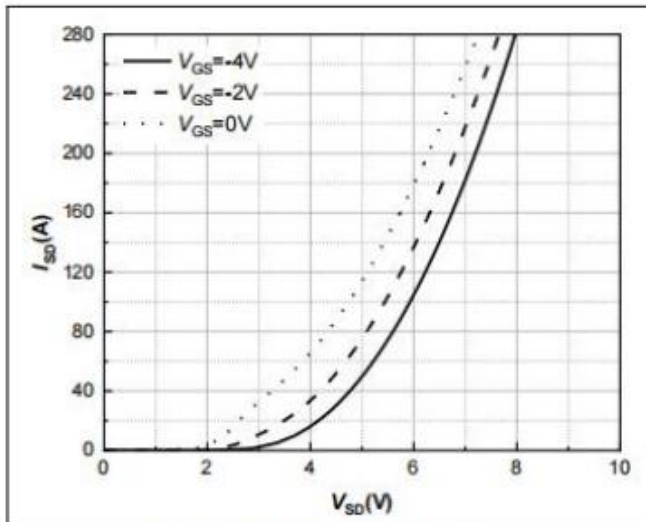
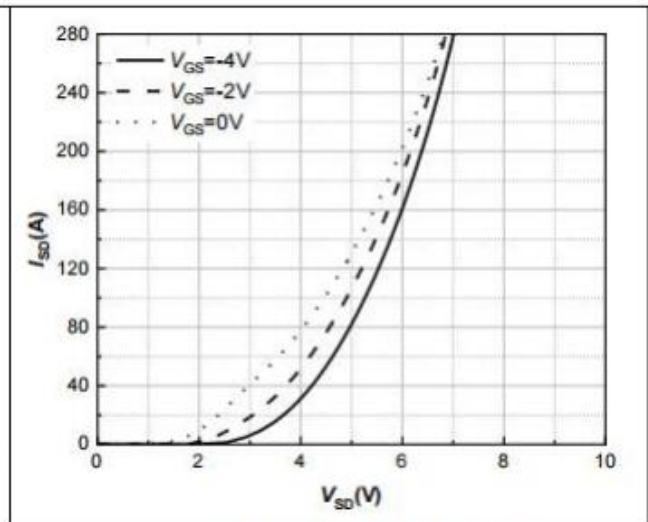


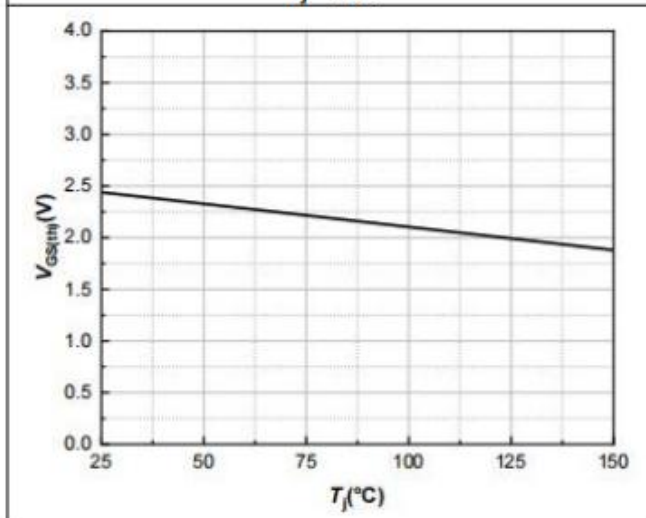
Figure 6. Transfer Characteristic for Various Junction Temperatures  $V_{DS} = 20\text{V}$



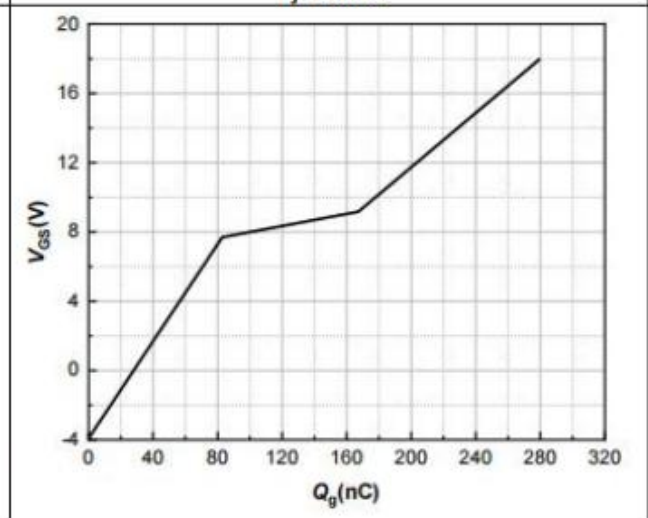
**Figure 7. Body Diode Characteristic**  
 $T_j = 75^\circ\text{C}$



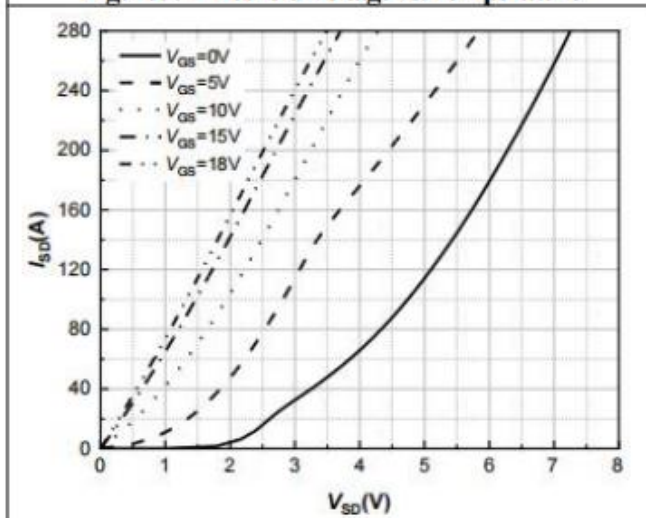
**Figure 8. Body Diode Characteristic**  
 $T_j = 150^\circ\text{C}$



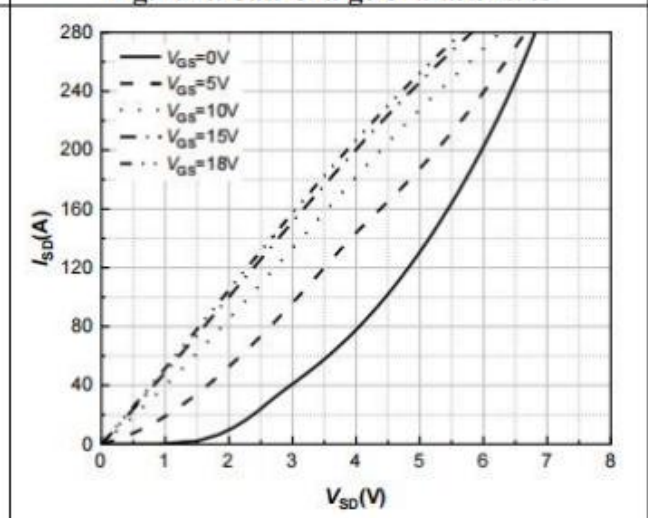
**Figure 9. Threshold Voltage vs. Temperature**



**Figure 10. Gate Charge Characteristics**



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



**Figure 12. 3rd Quadrant Characteristic**  
 $T_j = 150^\circ\text{C}$

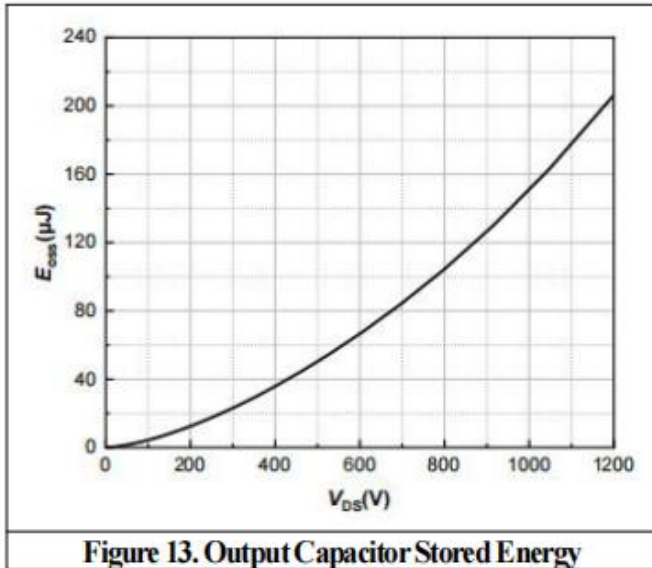


Figure 13. Output Capacitor Stored Energy

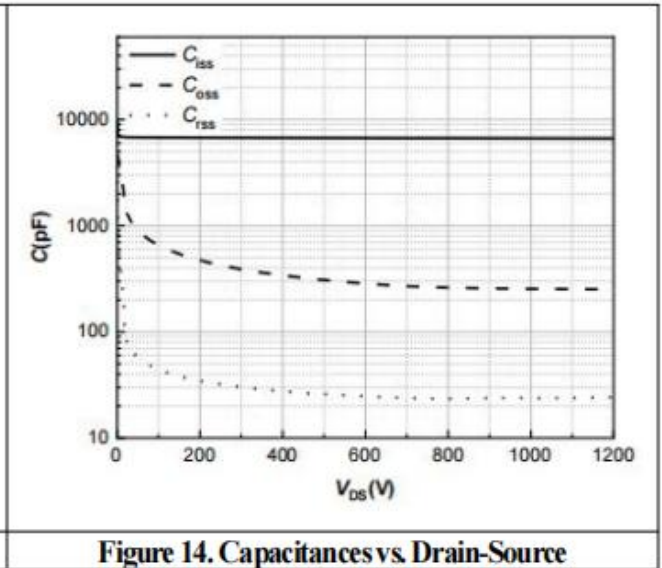


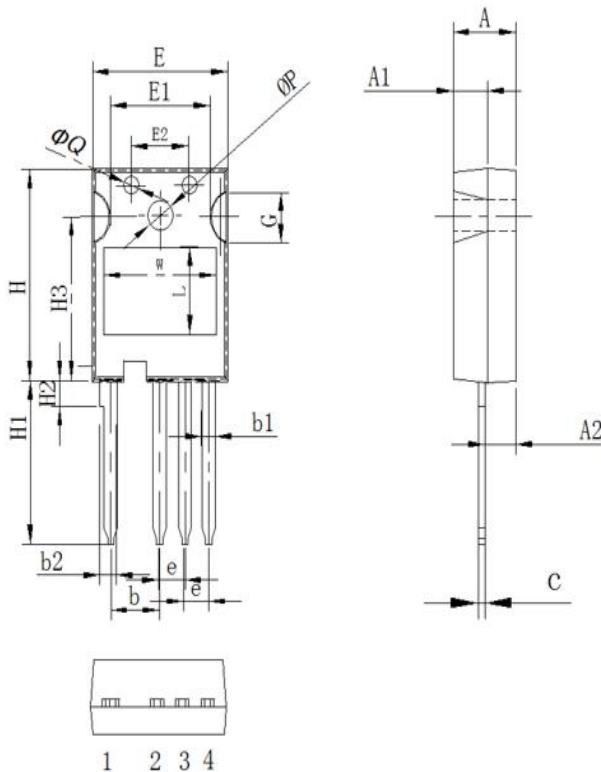
Figure 14. Capacitances vs. Drain-Source



## Package Information

### TO-247-4L PACKAGE

#### 基本尺寸



Symbol	单位 mm		
	Min	Nom	Max
A	4.8	5.00	5.20
A1	2.8	3.0	3.2
A2	2.20	2.40	2.60
b	4.85	5.05	5.25
b1	1.15	1.25	1.35
b2	2.30	2.50	2.70
c	0.50	0.60	0.70
e	2.35	2.55	2.75
E	15.5	15.7	15.9
E1	10.5	10.7	10.9
E2	7.4	7.6	7.8
G	4.8	5.0	5.2
H	22.4	22.6	22.8
H1	17.5	18.0	18.5
H2	2.42	2.62	2.82
H3	16.17	16.37	16.57
ΦP	3.40	3.60	3.8
ΦQ	2.3	2.5	2.7
W	11.8	12	12.2
L	8.3	8.5	8.7

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