

SiC MOSFET
SiC N-Channel Planar Power MOSFET
General Features

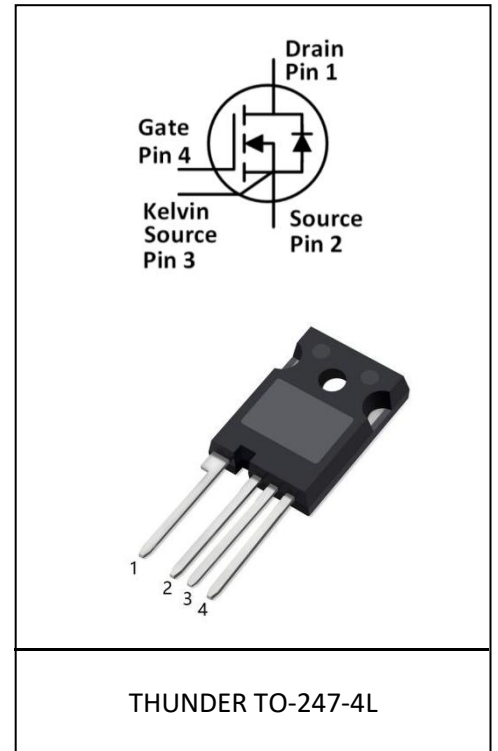
- $V_{DS}=1200V, I_D=26A$
- Low ON Resistance, $R_{DS(ON)}=160m\Omega @ V_{GS}=18V, I_D=10A$
- Low reverse transfer capacitance
- Low Qg for fast response
- Short fall & rise times for fast switching
- 100% single pulse avalanche energy Test

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
$R_{DS(on)}$	160m Ω
I_D	26A

Absolute Maximum Ratings

Parameter	Symbol	Value	Unit
Drain-source voltage	V_{DS}	1200	V
Continuous drain current	I_D^*	26	A
$T_C = 25^\circ C$		18	
$T_C = 100^\circ C$			
Pulsed drain current ($T_C = 25^\circ C$, t_p limited by T_{jmax})	I_{DM}^*	50	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...+175	$^\circ C$

* 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	2.8 2.0	4	V	$V_{DS} = V_{GS}, I_D = 2.5\text{mA}$ $T_j = 25^\circ\text{C}$ $T_j = 175^\circ\text{C}$
Zero gate voltage drain current	I_{DSS}	-	1	-	μA	$V_{DS} = 1200\text{V}, V_{GS} = 0\text{V}$
Gate-source leakage current	I_{GSS}	-	-	250	nA	$V_{DS} = 0\text{V}, V_{GS} = 18\text{V}$
Drain-source on-state resistance	$R_{DS(on)}$	-	160 206	-	m Ω	$V_{GS} = 18\text{V}, I_D = 10\text{A}$ $T_j = 25^\circ\text{C}$ $T_j = 175^\circ\text{C}$

Dynamic Characteristic

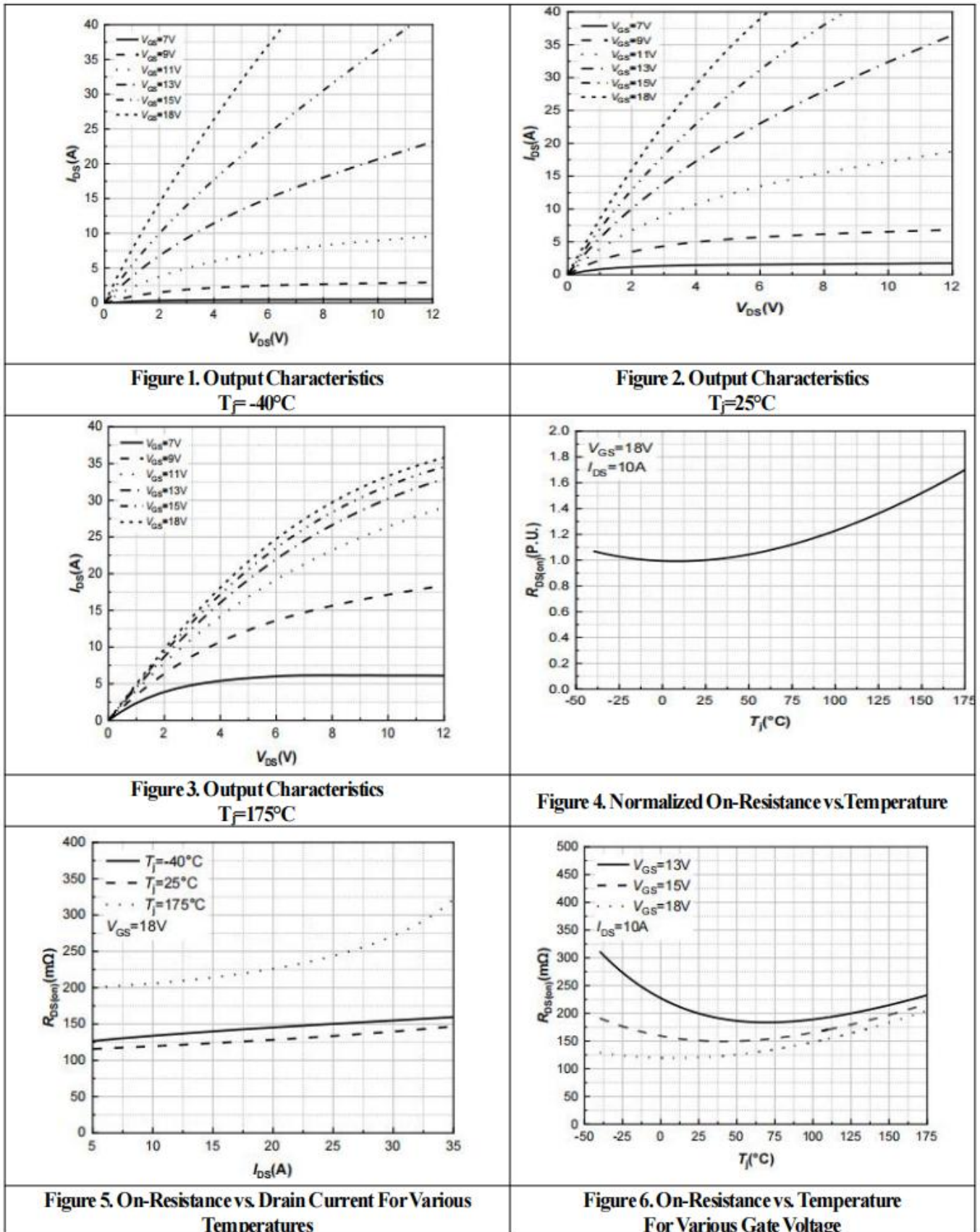
Input Capacitance	C_{iss}	-	692	-	pF	$V_{DS} = 1000\text{V},$ $f = 1\text{MHz},$ $V_{GS} = 0\text{V}$
Output Capacitance	C_{oss}	-	39	-		
Reverse Transfer Capacitance	C_{rss}	-	4	-		
Internal Gate Resistance	$R_{G(int)}$		1.9		Ω	$f = 1\text{MHz}$
Gate Total Charge	Q_g	-	37	-	nC	$V_{DS} = 800\text{V},$ $I_D = 10\text{A},$ $V_{GS} = -4/18\text{V}$
Gate-Source charge	Q_{gs}	-	9	-		

Gate-Drain charge	Q_{gd}	-	13	-	
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Body Diode Characteristic

Parameter	Symbol	Value			Unit	Test Condition
		min.	typ.	max.		
Body Diode Forward Voltage	V_{SD}	-	4.0	-	V	$V_{GS} = -4V, I_{SD} = 5A$ $T_j = 25^\circ C$ $T_j = 175^\circ C$ $V_{GS} = -4V, I_{SD} = 10A$ $T_j = 25^\circ C$ $T_j = 175^\circ C$
			3.6			
			4.6			
			4.0			
Body Diode Continuous Forward Current	I_S	-	26 17	-	A	$V_{GS} = -4V$ $T_C = 25^\circ C$ $T_C = 100^\circ C$
Body Diode Reverse Recovery Time	t_{rr}	-	47	-	ns	$V_{GS} = -4V, I_{SD} = 10A,$ $V_R = 800V,$ $di/dt = 1093A/us$
Body Diode Reverse Recovery Charge	Q_{rr}	-	144	-	μC	
Peak Reverse Recovery Current	I_{rm}		7		A	

Typical Performance



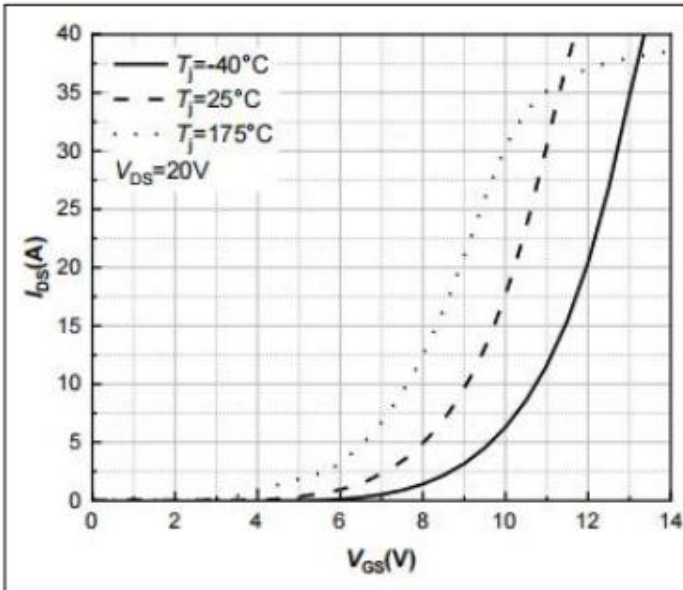


Figure 7. Transfer Characteristic for Various Junction Temperatures $V_{DS}=20V$

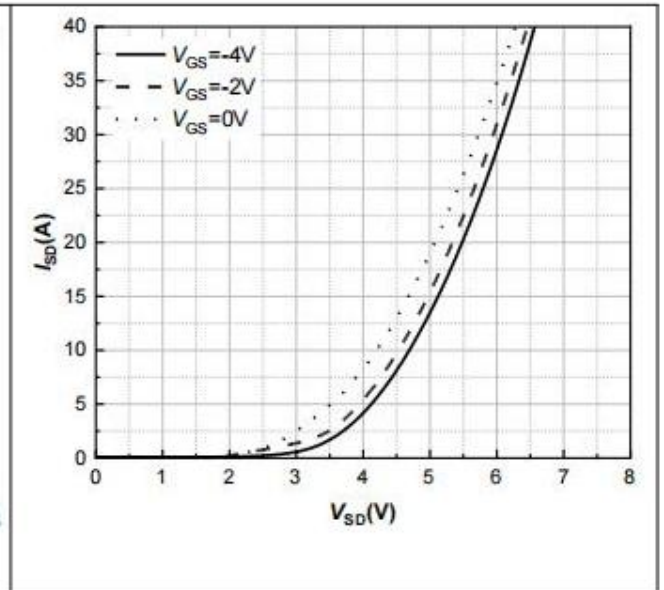


Figure 8. Body Diode Characteristic $T_J=-40^{\circ}C$

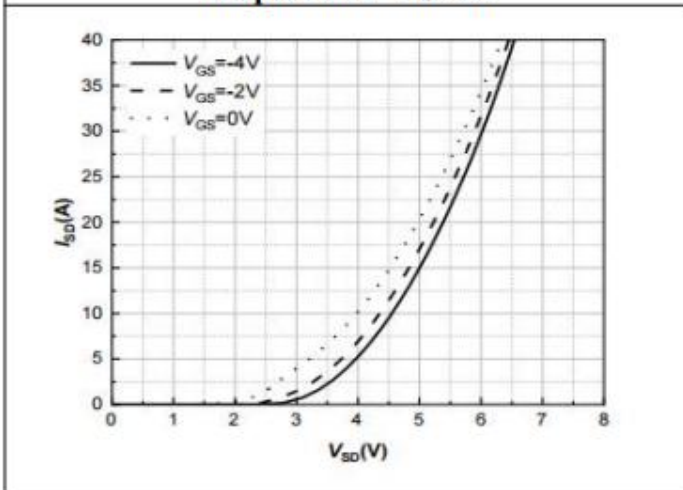


Figure 9. Body Diode Characteristic $T_J=25^{\circ}C$

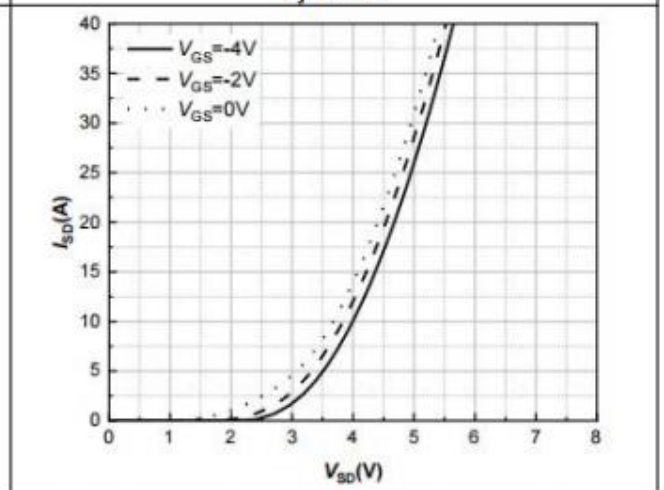


Figure 10. Body Diode Characteristic $T_J=175^{\circ}C$

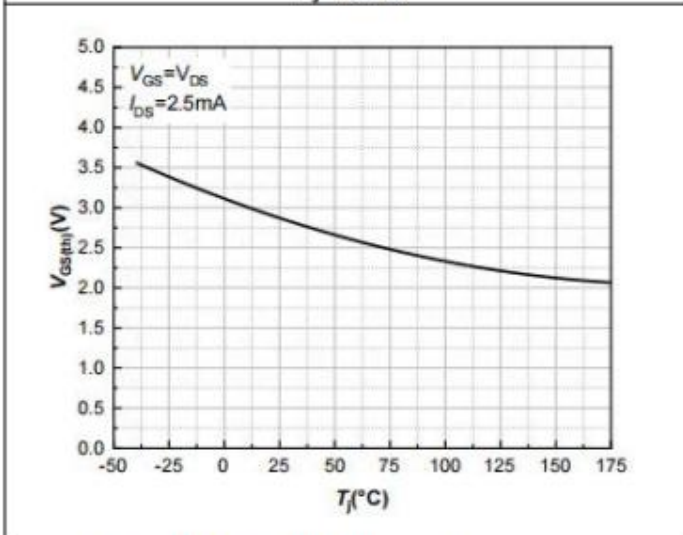


Figure 11. Threshold Voltage vs. Temperature

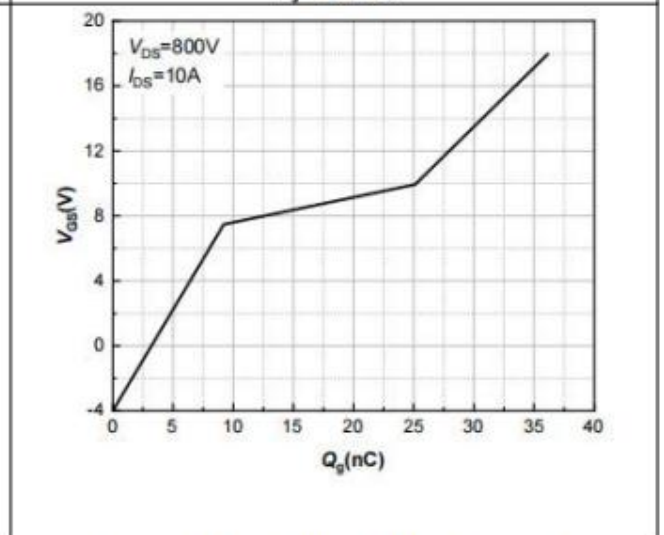


Figure 12. Gate Charge Characteristics

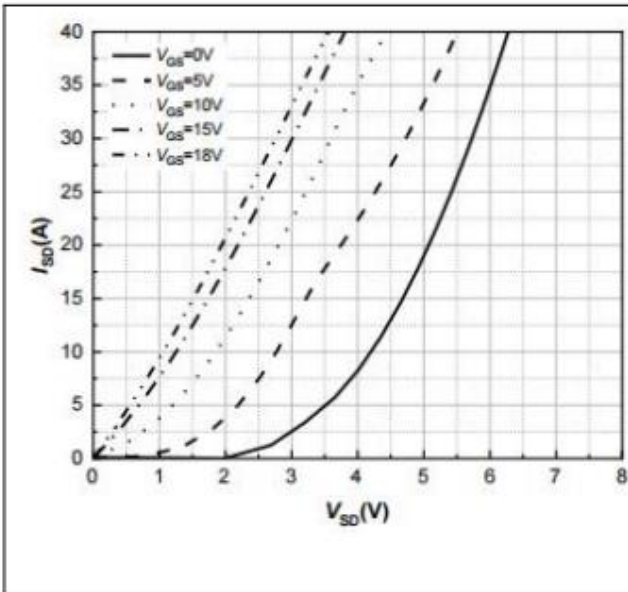


Figure 13. 3rd Quadrant Characteristic
 $T_j = -40^\circ\text{C}$

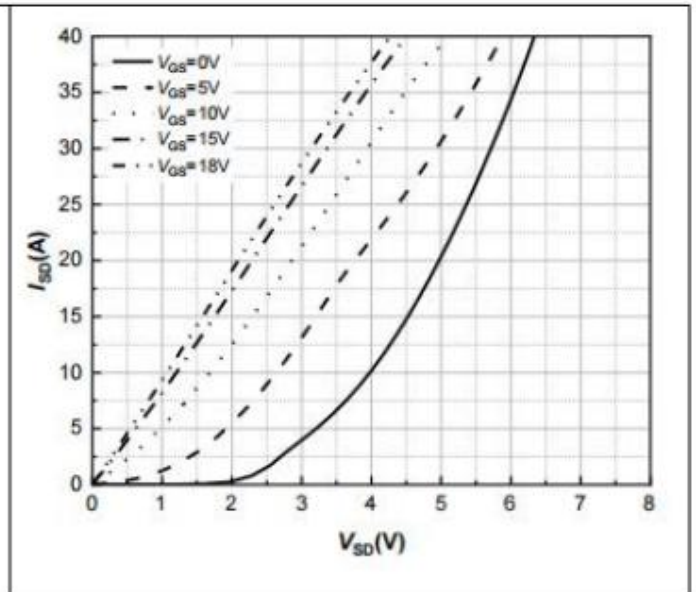


Figure 14. 3rd Quadrant Characteristic
 $T_j = 25^\circ\text{C}$

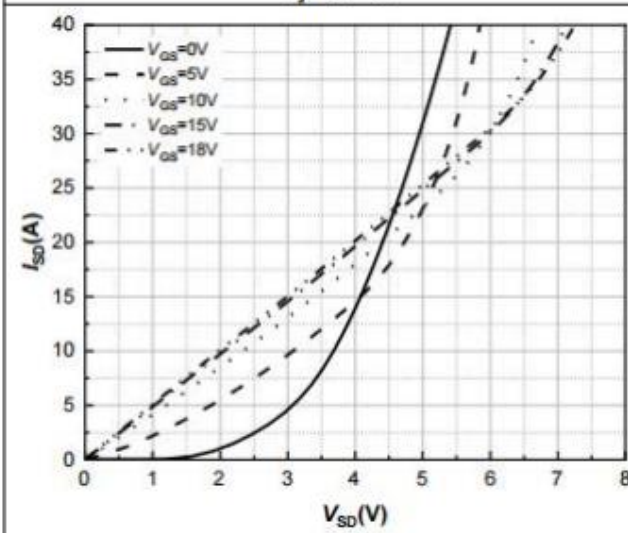


Figure 15. 3rd Quadrant Characteristic
 $T_j = 175^\circ\text{C}$

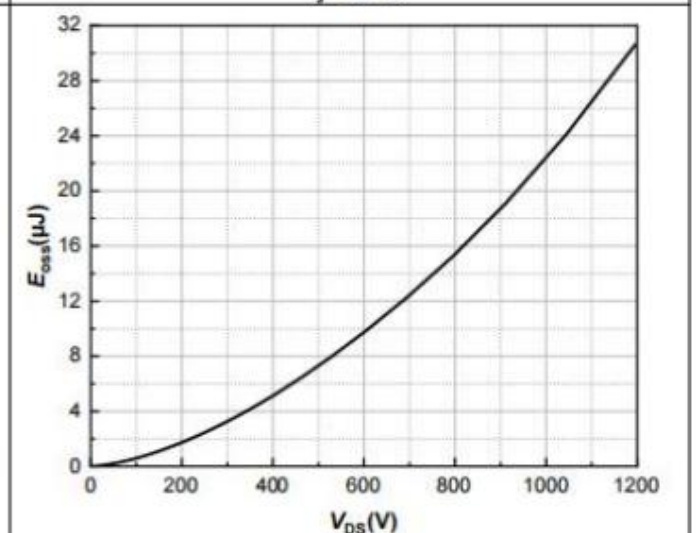


Figure 16. Output Capacitor Stored Energy

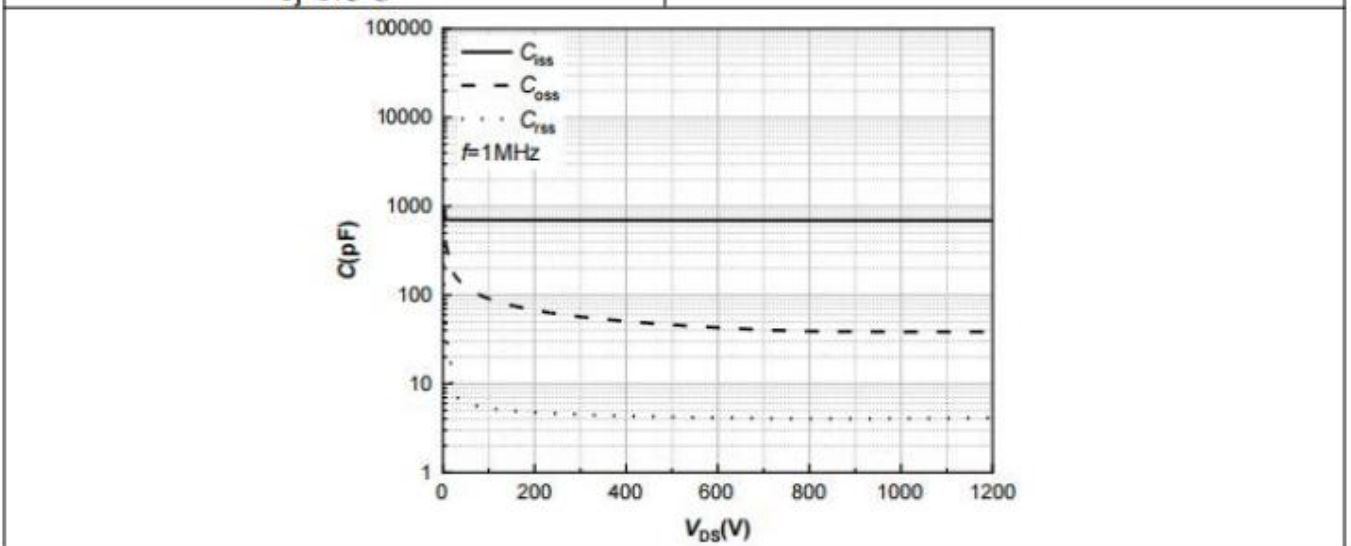
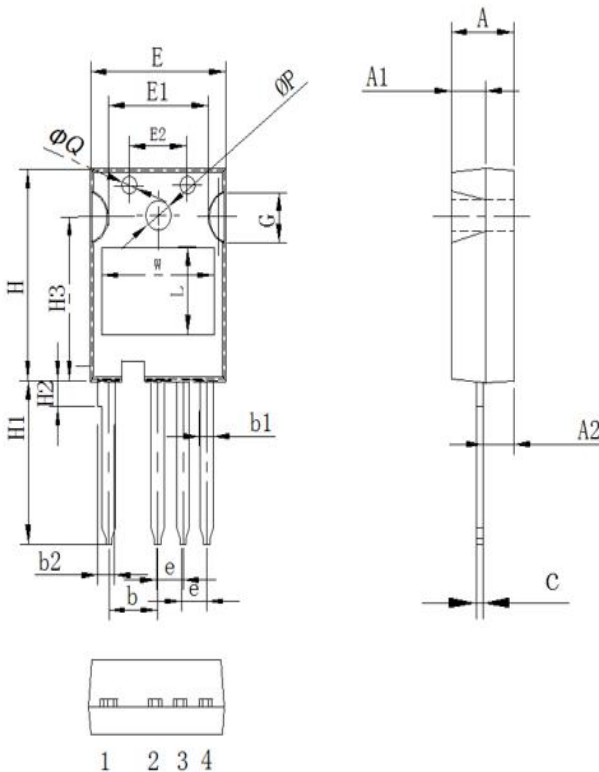


Figure 17. Capacitances vs. Drain-Source

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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-Headquarters

WuXi Thunder Microelectronics Incorporated Limited

Building E1-901, No.200 LingHu Road, XinWu district,WuXi,China 214135

Tel:+86-510-85160109 Fax:+86-510-85160109