REASUNOS

RSM1701K0W

N-Channel SiC Power MOSFET

V_{DS}	=	1700 V
$R_{DS(on)}$	=	1.0Ω
I_D@25℃	=	5 A

Features

- High Blocking Voltage with Low On-Resistance
- High Speed Switching with Low Capacitance
- Easy to Parallel and Simple to Drive

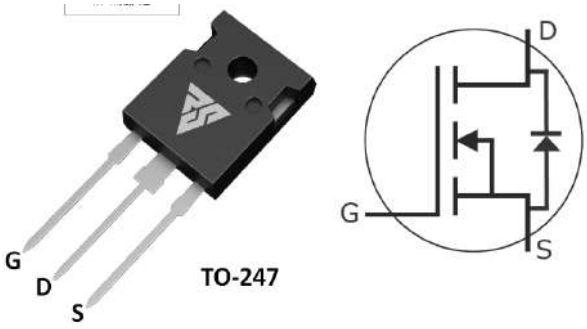
Benefits

- Higher System Efficiency
- Reduced Cooling Requirements
- Increased Power Density
- Increased System Switching Frequency

Applications

- Auxiliary Power Supplies
- Switch Mode Power Supplies

Package



Part Number	Package
RSM1701K0W	TO-247-3

Maximum Ratings (T_C=25℃ unless otherwise specified)

Symbol	Parameter	Value	Unit	Test Conditions	Note
V_{DSmax}	Drain-Source Voltage	1700	V	V_{GS}=0V, I_D=100μA	
V_{GSmax}	Gate-Source Voltage	-10/+25	V	Absolute maximum values	
V_{GSop}	Gate-Source Voltage	-5/+20	V	Recommended operational values	
I_D	Continuous Drain Current	5.0	A	V_{GS}=20V, T_C=25℃	
		3.5		V_{GS}=20V, T_C=100℃	
$I_{D(pulse)}$	Pulsed Drain Current	6.0	A	Pulse width t_p limited by T_{Jmax}	
P_D	Power Dissipation	69	W	T_C=25℃, T_J=150℃	
T_J, T_{STG}	Operating Junction and Storage Temperature	-55 to +150	℃		

Electrical Characteristics (T_C=25℃ unless otherwise specified)

Symbol	Parameter	Min.	Typ.	Max.	Unit	Test Conditions	Note
$V_{(BR)DSS}$	Drain-Source Breakdown Voltage	1700	/	/	V	V_{GS}=0V, I_D=100μA	
$V_{GS(th)}$	Gate Threshold Voltage	2.5	3.0	4.5	V	V_{DS}=V_{GS}, I_D=1mA	
		/	2.2	/		V_{DS}=V_{GS}, I_D=1mA, T_J=150℃	
I_{DSS}	Zero Gate Voltage Drain Current	/	1	100	μA	V_{DS}=1700V, V_{GS}=0V	
I_{GSS+}	Gate-Source Leakage Current	/	/	250	nA	V_{DS}=0V, V_{GS}=25V	
I_{GSS-}	Gate-Source Leakage Current	/	/	250	nA	V_{DS}=0V, V_{GS}=-10V	
$R_{DS(on)}$	Drain-Source On-State Resistance	/	1.0	1.3	Ω	V_{GS}=20V, I_D=2A	
		/	1.5	/		V_{GS}=20V, I_D=2A, T_J=150℃	
g_{fs}	Transconductance	/	1.15	/	S	V_{DS}=20V, I_D=2 A	
		/	1.30	/		V_{DS}=20V, I_D=2A, T_J=150℃	
C_{iss}	Input Capacitance	/	186	/	pF	V_{GS}=0V V_{DS}=1000V f=1MHz	
C_{oss}	Output Capacitance	/	12	/			
C_{rss}	Reverse Transfer Capacitance	/	1.6	/			
E_{oss}	C_{oss}Stored Energy	/	6.2	/	μJ	V_{AC}=25mV	
E_{ON}	Turn-On Switching Energy	/	48	/		V_{DS}=1200V, V_{GS}=-5V/20V I_D=2A, $R_{G(ext)}$=2.5Ω, L=1500μH	
E_{OFF}	Turn-Off Switching Energy	/	18	/			
$t_{d(on)}$	Turn-On Delay Time	/	5.2	/	ns	V_{DS}=1200V, V_{GS}=-5V/20V, I_D=2A $R_{G(ext)}$=2.5Ω, R_L=600Ω	
t_r	Rise Time	/	9.4	/			
$t_{d(off)}$	Turn-Off Delay Time	/	13.2	/			
t_f	Fall Time	/	22.0	/			
RG	Internal Gate Resistance	/	22	/	Ω	f=1MHz open drain	
Q_{GS}	Gate to Source Charge	/	5.2	/	nC	V_{DS}=1200V V_{GS}=-5V/20V I_D=2A	
Q_{GD}	Gate to Drain Charge	/	7.3	/			
Q_G	Total Gate Charge	/	21.8	/			

Reverse Diode Characteristics

Symbol	Paramete r	Typ.	Max.	Unit	Test Conditions	Note
V_{SD}	Diode Forward Voltage	4.2	/	V	V_{GS}=-5V, I_{SD}=1A	
		3.9	/		V_{GS}=-5V, I_{SD}=1A, T_J=150℃	
I_S	Continuous Diode Forward Current	/	4	A	T_C=25℃	
t_{rr}	Reverse Recover Time	25	/	ns	V_{GS}=-5V,V_R=1200V, I_{SD}=2A	
Q_{rr}	Reverse Recovery Charge	15	/	nC		
I_{rrm}	Peak Reverse Recovery Current	2.8	/	A		

Thermal Characteristics

Symbol	Parameter	Typ.	Max.	Unit	Test Conditions	Note
$R_{\theta JC}$	Thermal Resistance from Junction to Case	1.8	2.0	℃/W		

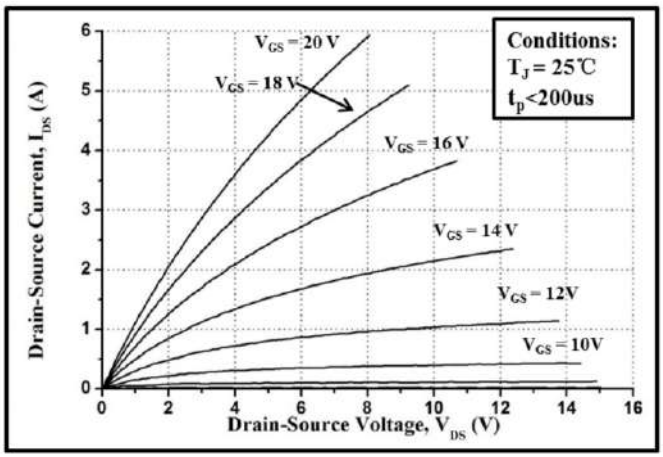


Figure 1. Typical Output Characteristics T_J= 25℃

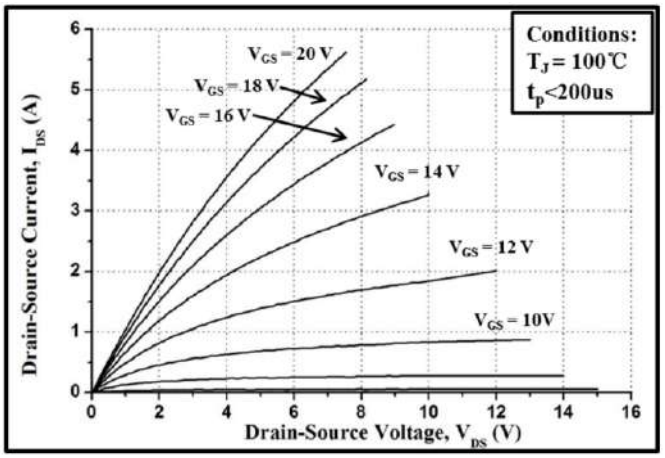


Figure 2. Typical Output Characteristics T_J= 100℃

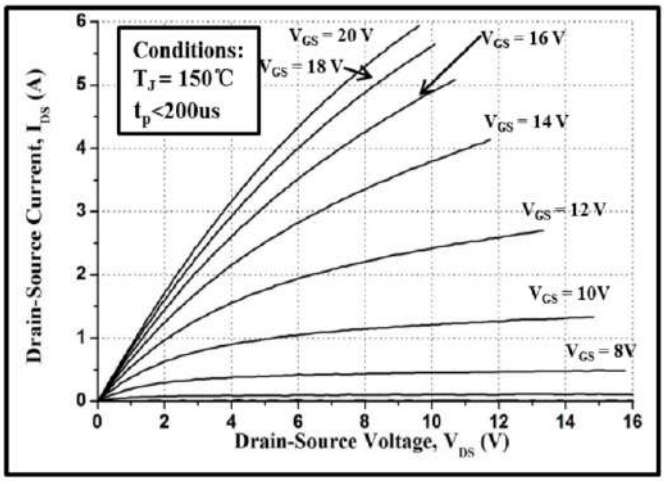


Figure 3. Typical Output Characteristics T_J=150℃

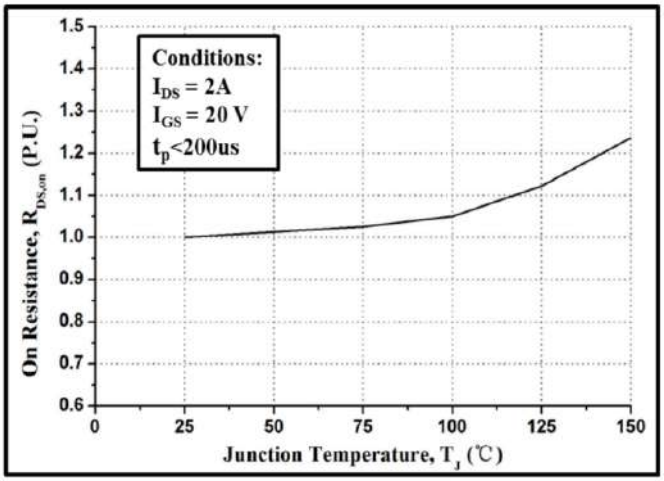


Figure 4. Normalized On-Resistance vs. Temperature

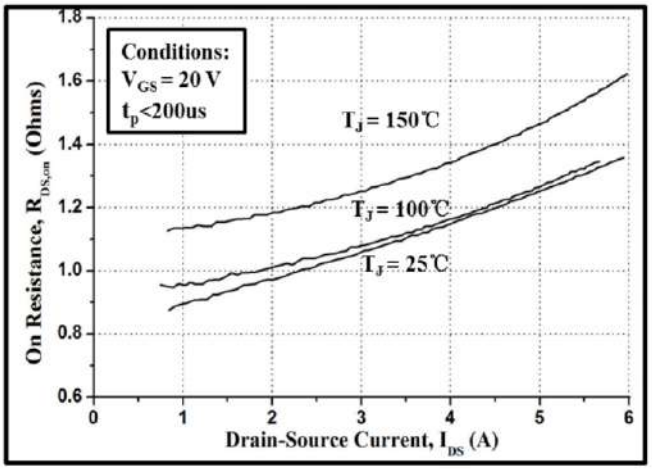


Figure 5. On-Resistance vs. Drain Current

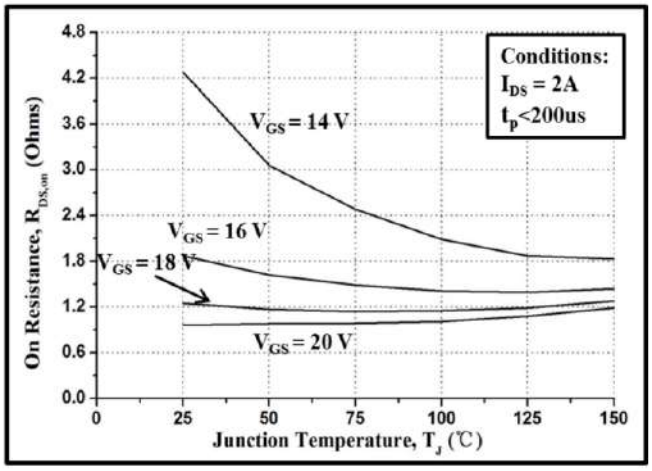


Figure 6. On-Resistance vs. Temperature

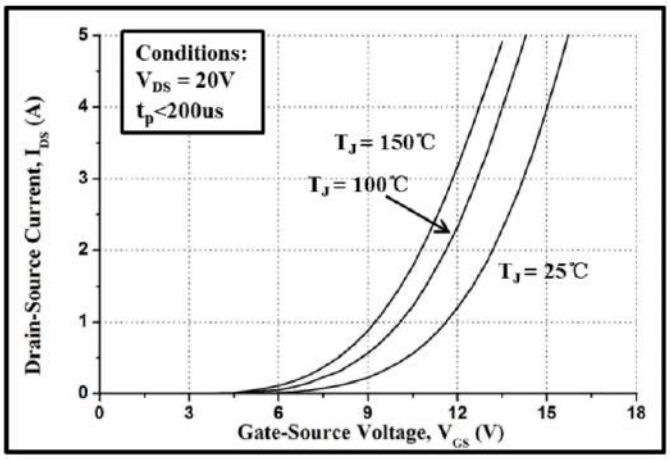


Figure 7. Typical Transfer Characteristics

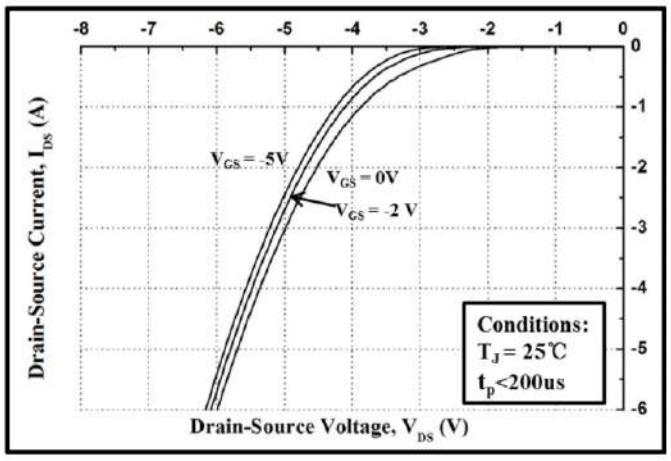


Figure 8. Body Diode Characteristics at 25℃

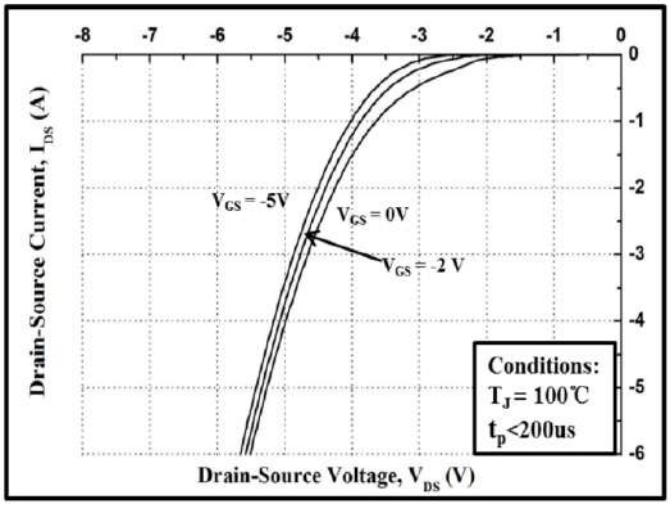


Figure 9. Body Diode Characteristics at 100℃

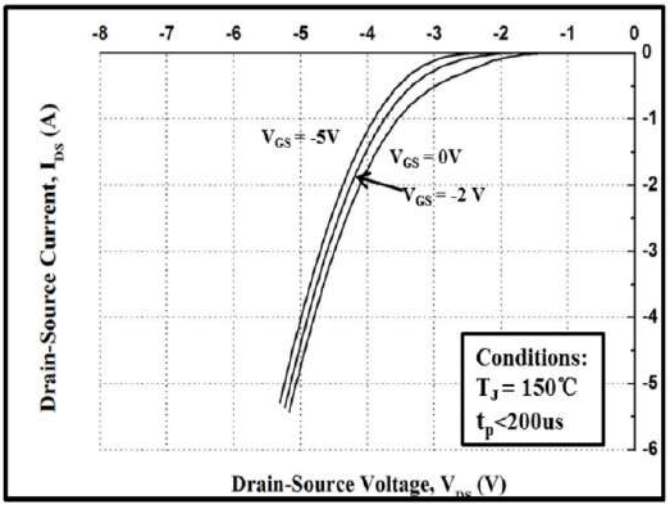


Figure 10. Body Diode Characteristics at 150℃

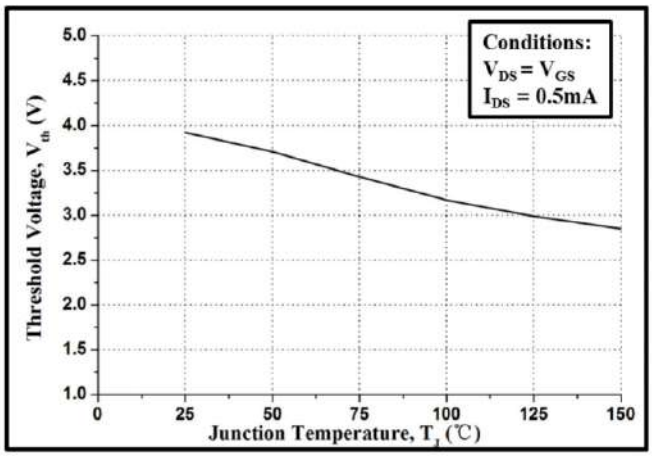


Figure 11. Gate Threshold Voltage vs. Temperature

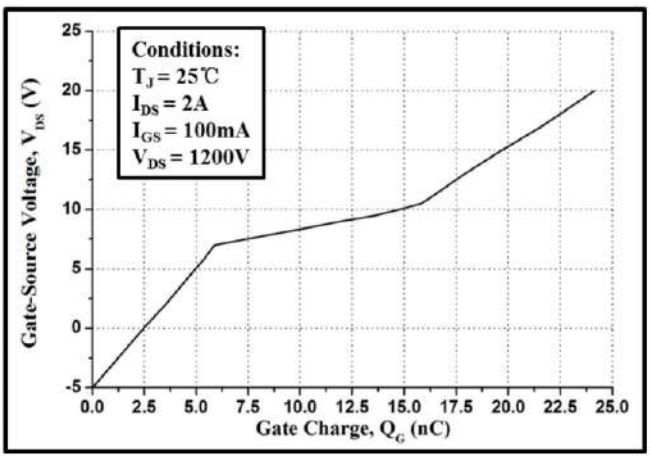


Figure 12. Gate Charge Characteristic

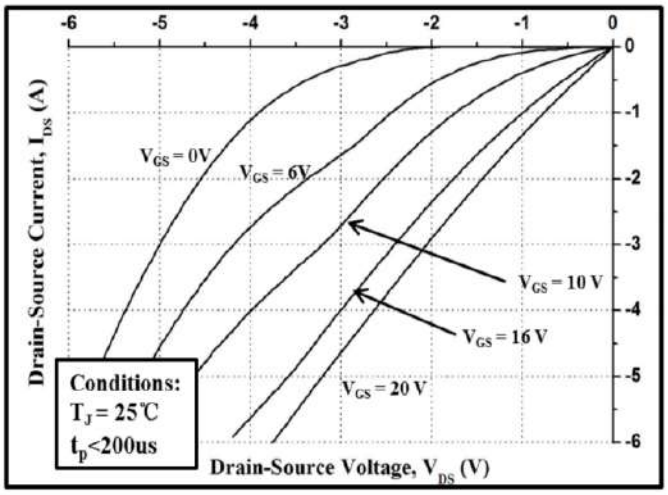


Figure 13. 3rd Quadrant Characteristics at 25℃

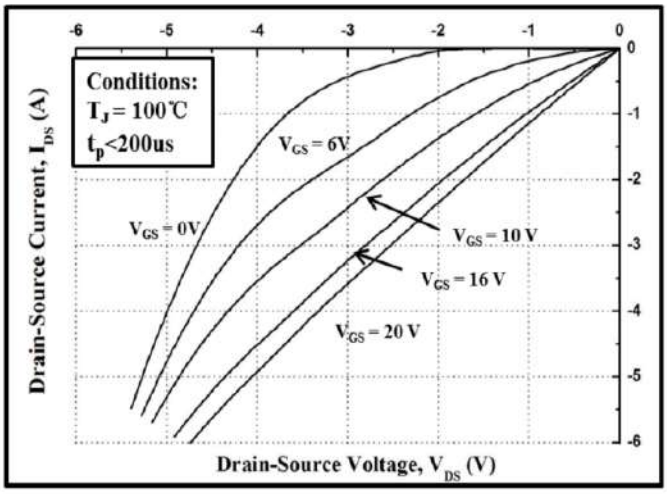


Figure 14. 3rd Quadrant Characteristics at 100℃

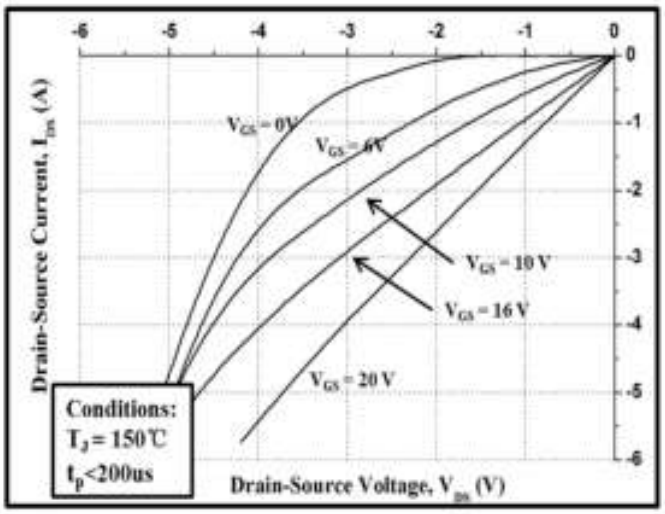


Figure 15. 3rd Quadrant Characteristics at 150℃

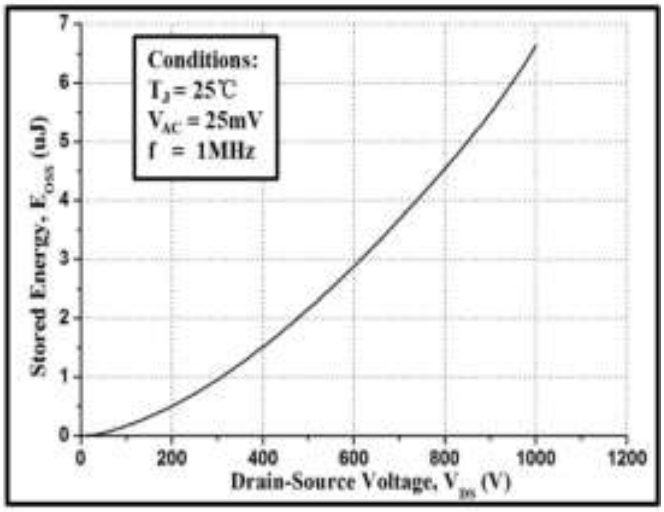


Figure 16. Output Capacitor Stored Energy

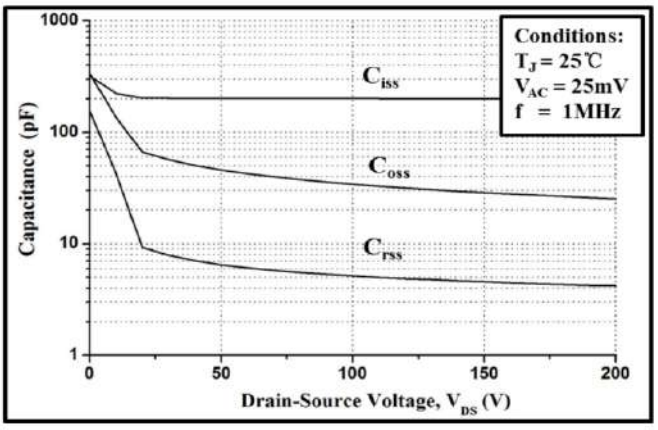


Figure 17. Capactances vs. Drain-Source Voltage

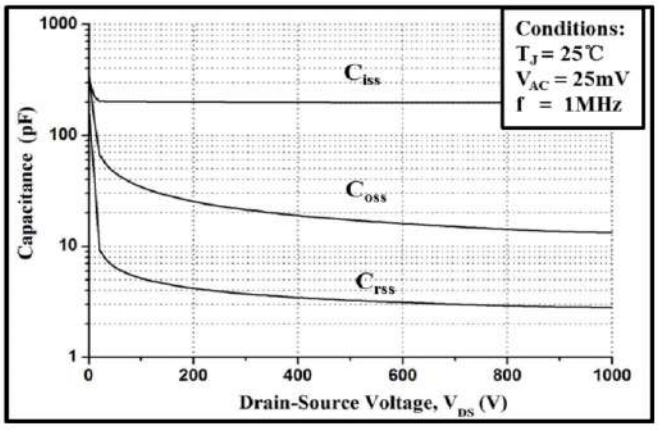
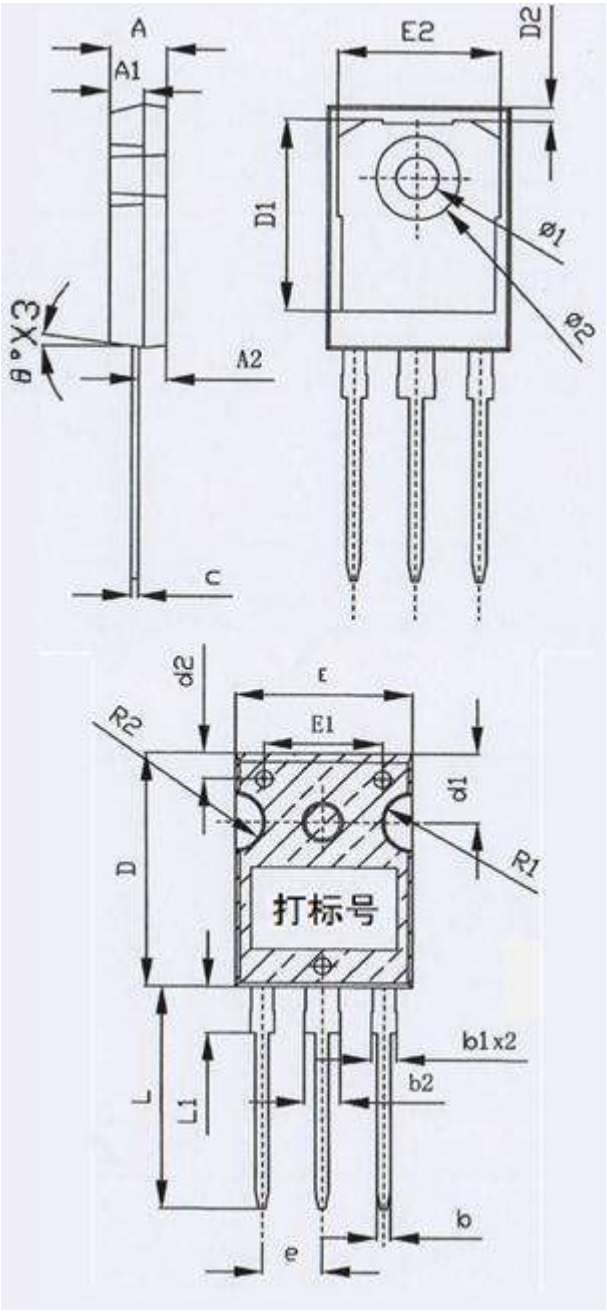


Figure 18. Capactances vs. Drain-Source Voltage

Package Dimensions

Package TO-247-3



SYMBOLS	DIMENSIONS IN MILLMETERS		
	MIN	NOM	MAX
A	4.9	5	5.1
A1	2.9	3	3.1
A2	2.31	2.36	2.41
b	1.16	1.2	1.26
b1	2.05	-	2.2
b2	3.05	-	3.2
c	0.58	0.6	0.66
D	20.9	21	21.1
D1	16.46	16.56	16.76
D2		1.17	
d1	6.05	6.15	6.25
d2	2.2	2.3	2.4
E	15.7	15.8	15.9
E1		10.5	
E2		14.02	
e	-	1.27bcs	-
L	19.82	19.92	20.02
L1	1.88	1.98	2.08
θ	0°	7°	8°
R1	-	2.7	-
R2	-	2.5	-
Φ1		3.6	
Φ2	-	7.19	-

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