REASUNOS

RSM120160Z

N-Channel SiC Power MOSFET

V_{DS}	=	1200	V
$R_{DS(on)}$	=	160	mΩ
I_D@25℃	=	18	A

Features

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

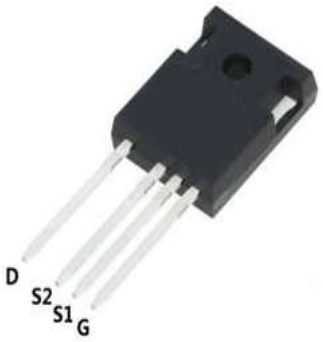
Benefits

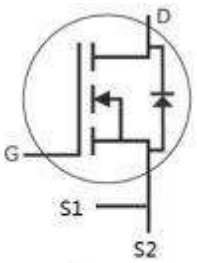
- Higher System Efficiency
- Reduced Cooling Requirements
- Increased Power Density
- Increased System Switching Frequency

Applications

- Power Supplies
- High Voltage DC/DC Converters
- Motor Drives
- Switch Mode Power Supplies
- Pulsed Power applications

Package





S1: Driver Source
S2: Power Source

Part Number	Package
RSM120160Z	TO-247-4

Maximum Ratings (T_C=25℃ unless otherwise specified)

Symbol	Parameter	Value	Unit	Test Conditions	Note
V_{DSmax}	Drain-Source Voltage	1200	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	18	A	V_{GS}=20V, T_c=25℃	
		12		V_{GS}=20V, T_c=100℃	
$I_{D(pulse)}$	Pulsed Drain Current	40	A	Pulse width t_p limited by T_{Jmax}	
P_D	Power Dissipation	125	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	1200	/	/	V	V_{GS}=0V, I_D=100μA	
$V_{GS(th)}$	Gate Threshold Voltage	2.0	2.4	4.0	V	V_{DS}=V_{GS}, I_D=2.5mA	Fig. 11
		/	1.8	/		V_{DS}=V_{GS}, I_D=2.5mA, T_J=150℃	
I_{DSS}	Zero Gate Voltage Drain Current	/	1	100	μA	V_{DS}=1200V, V_{GS}=0V	
I_{GSS+}	Gate-Source Leakage Current	/	10	250	nA	V_{DS}=0V, V_{GS}=25V	
I_{GSS-}	Gate-Source Leakage Current	/	10	250	nA	V_{DS}=0V, V_{GS}=-10V	
$R_{DS(on)}$	Drain-Source On-State Resistance	/	160	196	mΩ	V_{GS}=20V, I_D=10A	Fig. 4,5,6
		/	280	/		V_{GS}=20V, I_D=10A, T_J=150℃	
C_{iss}	Input Capacitance	/	890	/	pF	V_{GS}=0V V_{DS}=1000V f=1MHz	Fig. 15,16
C_{oss}	Output Capacitance	/	54	/			
C_{rss}	Reverse Transfer Capacitance	/	8.5	/			
E_{oss}	C_{oss}Stored Energy	/	31	/	μJ	V_{AC}=25mV	
E_{ON}	Turn-On Switching Energy	/	TBD	/	mJ	V_{DS}=800V, V_{GS}=-5V/20V I_D=10A, $R_{G(ext)}$=2.5Ω, L=200μH	
E_{OFF}	Turn-Off Switching Energy	/	TBD	/			
$t_{d(on)}$	Turn-On Delay Time	/	8	/	ns	V_{DS}=800V, V_{GS}=-5V/20V, I_D=10A $R_{G(ext)}$=2.5Ω, R_L=80Ω	
t_r	Rise Time	/	9	/			
$t_{d(off)}$	Turn-Off Delay Time	/	14	/			
t_f	Fall Time	/	9	/			
$R_{G(int)}$	Internal Gate Resistance	/	5.5	/	Ω	f=1MHz, V_{AC}=25mV	
Q_{GS}	Gate to Source Charge	/	17	/	nC	V_{DS}=800V V_{GS}=-5V/20V I_D=10A	
Q_{GD}	Gate to Drain Charge	/	9	/			
Q_G	Total Gate Charge	/	49	/			

Reverse Diode Characteristics

Symbol	Parameter	Typ.	Max.	Unit	Test Conditions	Note
V_{SD}	Diode Forward Voltage	4.2	/	V	V_{GS}=-5V, I_{SD}=5A	Fig. 8,9,10
		3.9	/		V_{GS}=-5V, I_{SD}=5A, T_J=150℃	
I_S	Continuous Diode Forward Current	/	23	A	T_C=25℃	
t_{rr}	Reverse Recover Time	28	/	ns	V_R=800V, I_{SD}=10A	
Q_{rr}	Reverse Recovery Charge	50	/	nC		
I_{rrm}	Peak Reverse Recovery Current	3	/	A		

Thermal Characteristics

Symbol	Parameter	Typ.	Max.	Unit	Test Conditions	Note
$R_{\theta JC}$	Thermal Resistance from Junction to Case	0.9	/	℃/W		
$R_{\theta JA}$	Thermal Resistance from Junction to Ambient	/	40			

Typical Performance

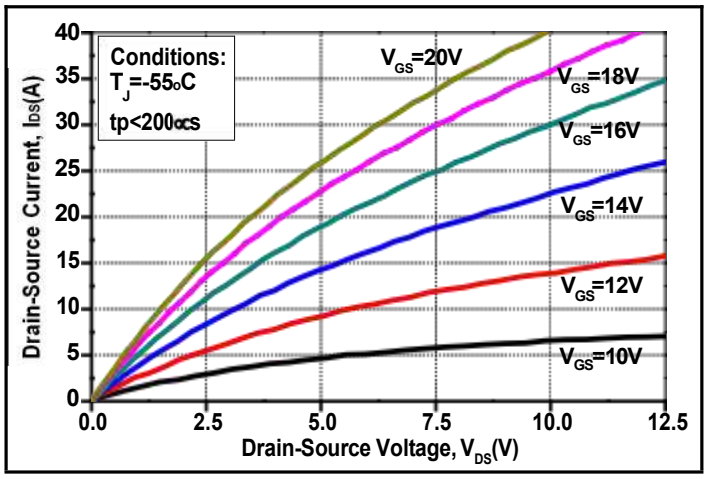


Figure 1. Output Characteristics T_J = -55℃

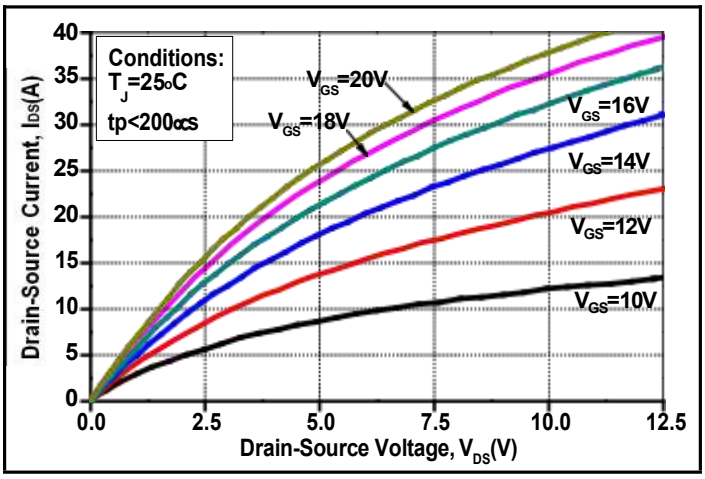


Figure 2. Output Characteristics T_J = 25℃

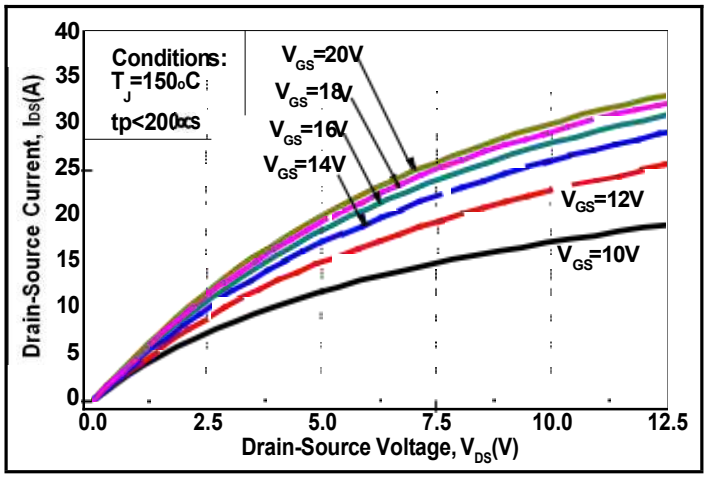


Figure 3. Output Characteristics T_J = 150℃

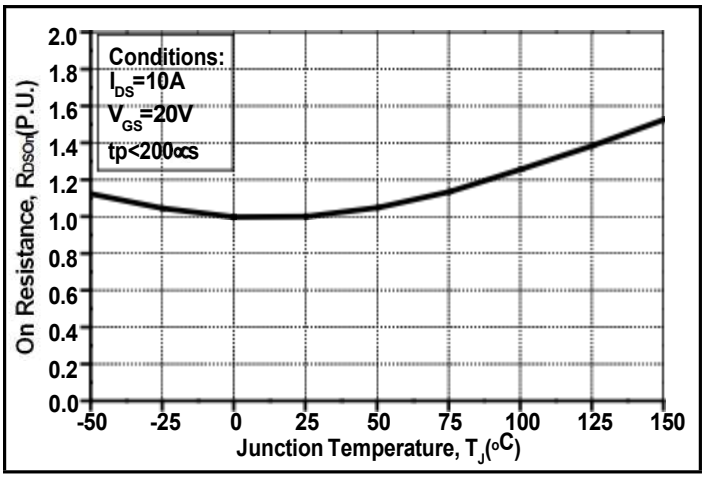


Figure 4. Normalized On-Resistance vs. Temperature

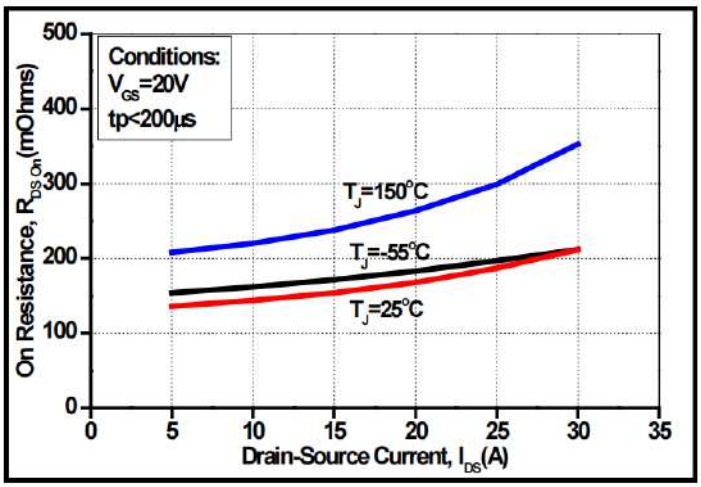


Figure 5. On-Resistance vs. Drain Current

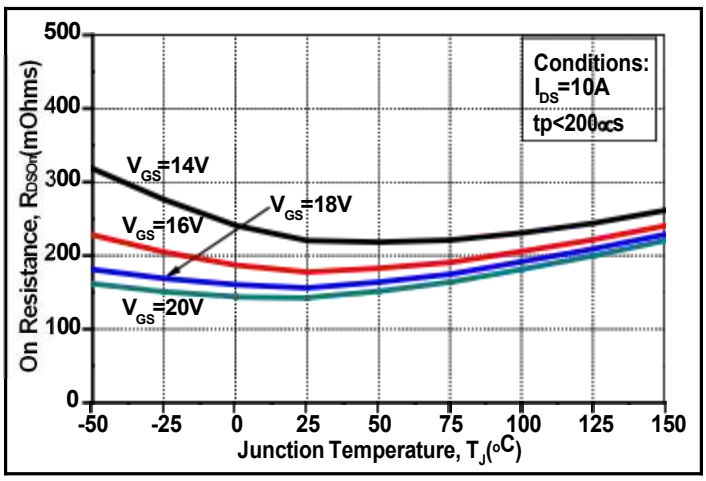


Figure 6. On-Resistance vs. Temperature
For Various Gate Voltage

Typical Performance

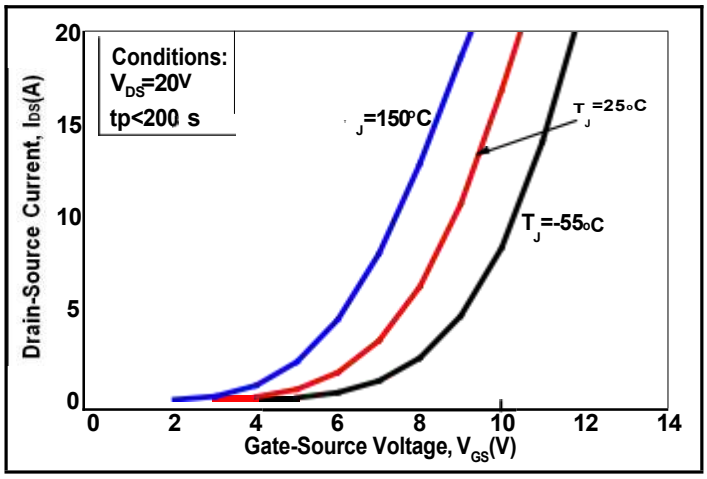


Figure 7. Transfer Characteristic for Various Junction Temperatures

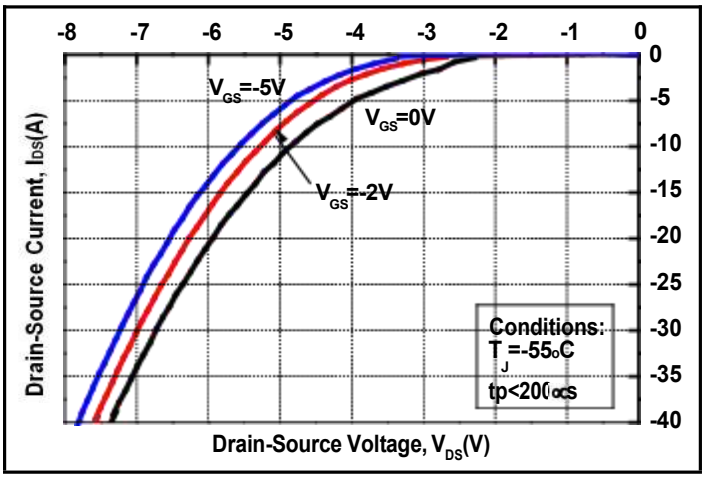


Figure 8. Body Diode Characteristic at -55℃

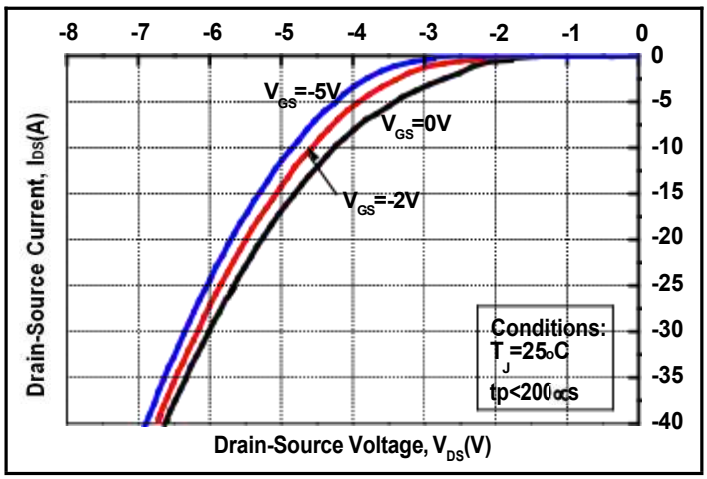


Figure 9. Body Diode Characteristic at 25℃

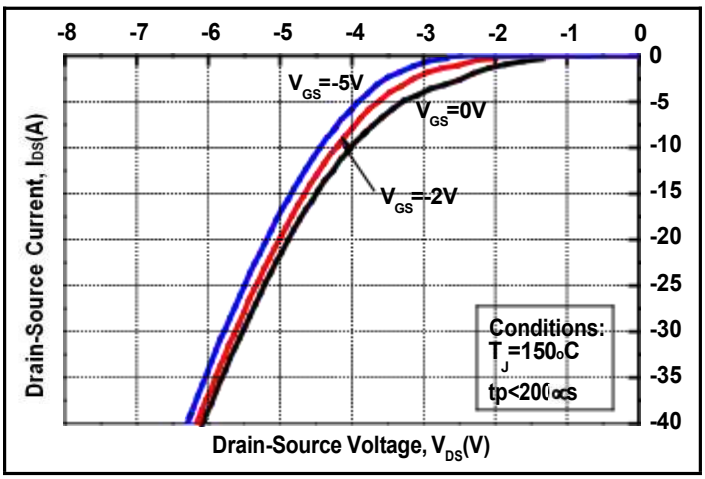


Figure 10. Body Diode Characteristic at 150℃

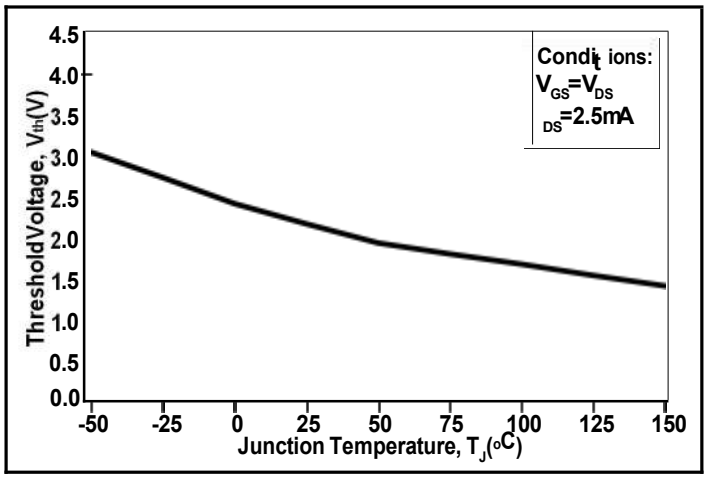


Figure 11. Threshold Voltage vs. Temperature

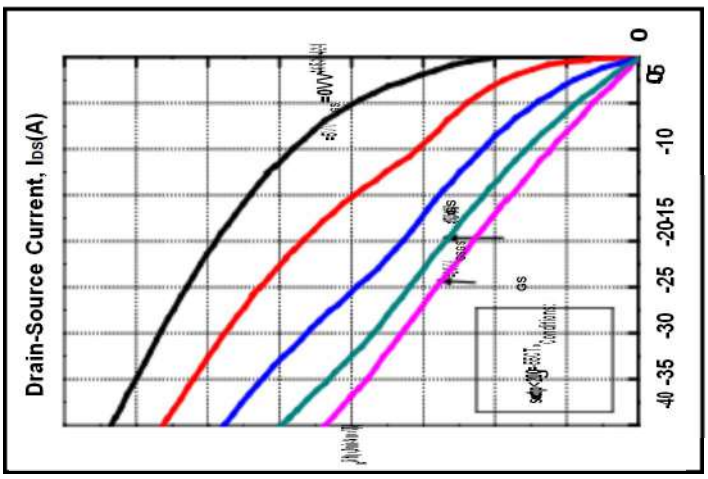


Figure 12. 3rd Quadrant Characteristic at -55℃

Typical Performance

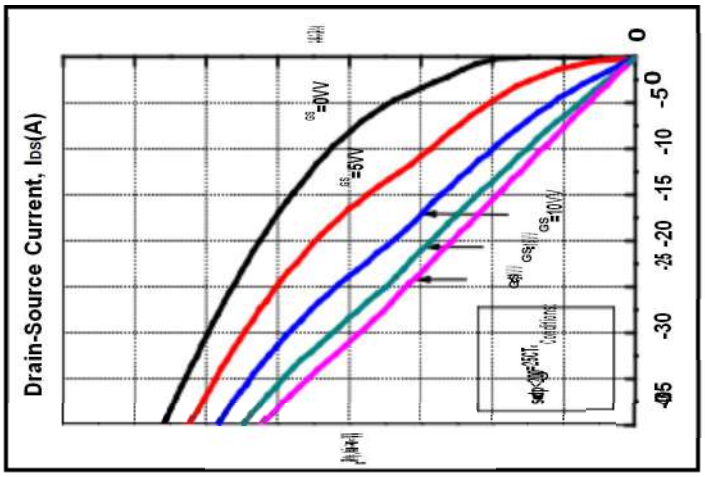


Figure 13. 3rd Quadrant Characteristic at 25℃

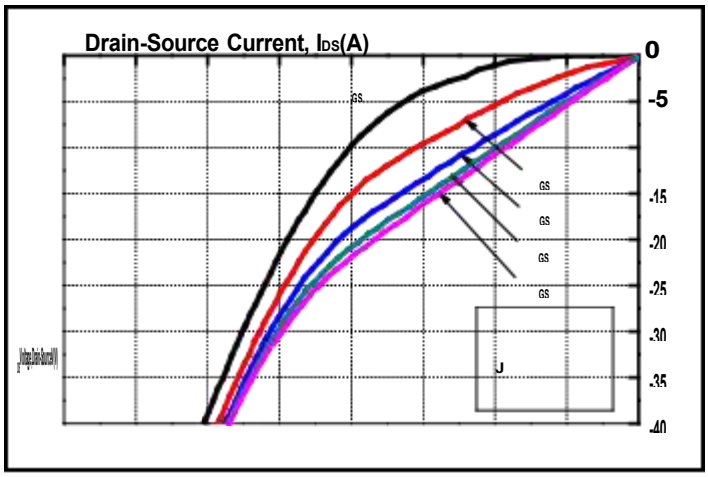


Figure 14. 3rd Quadrant Characteristic at 150℃

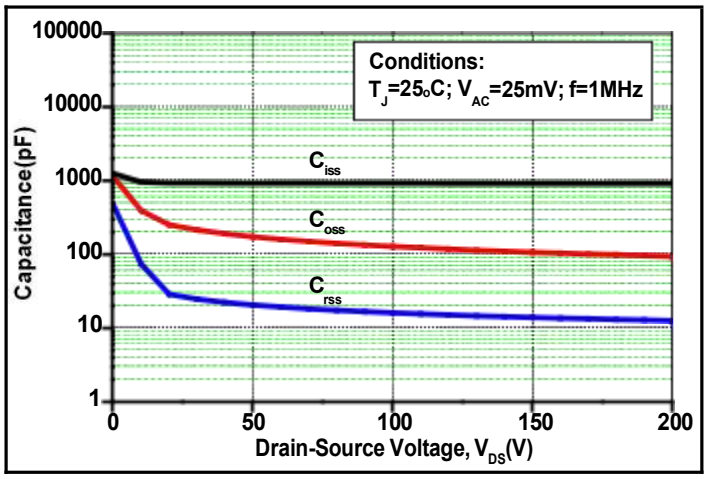


Figure 15. Capacitances vs. Drain-Source Voltage (0 - 200V)

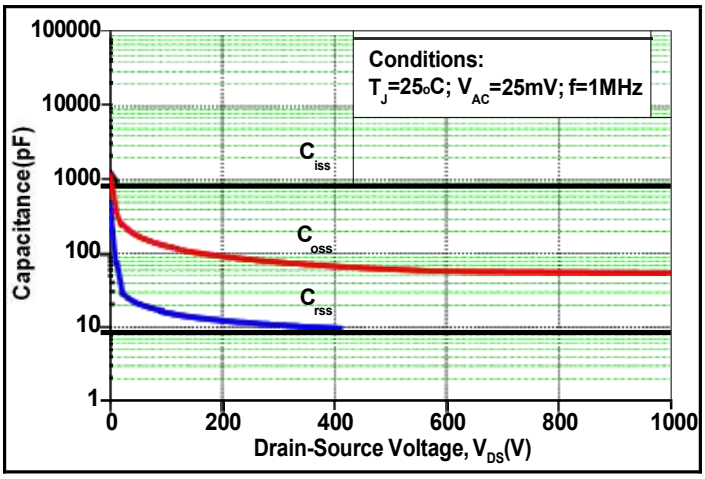
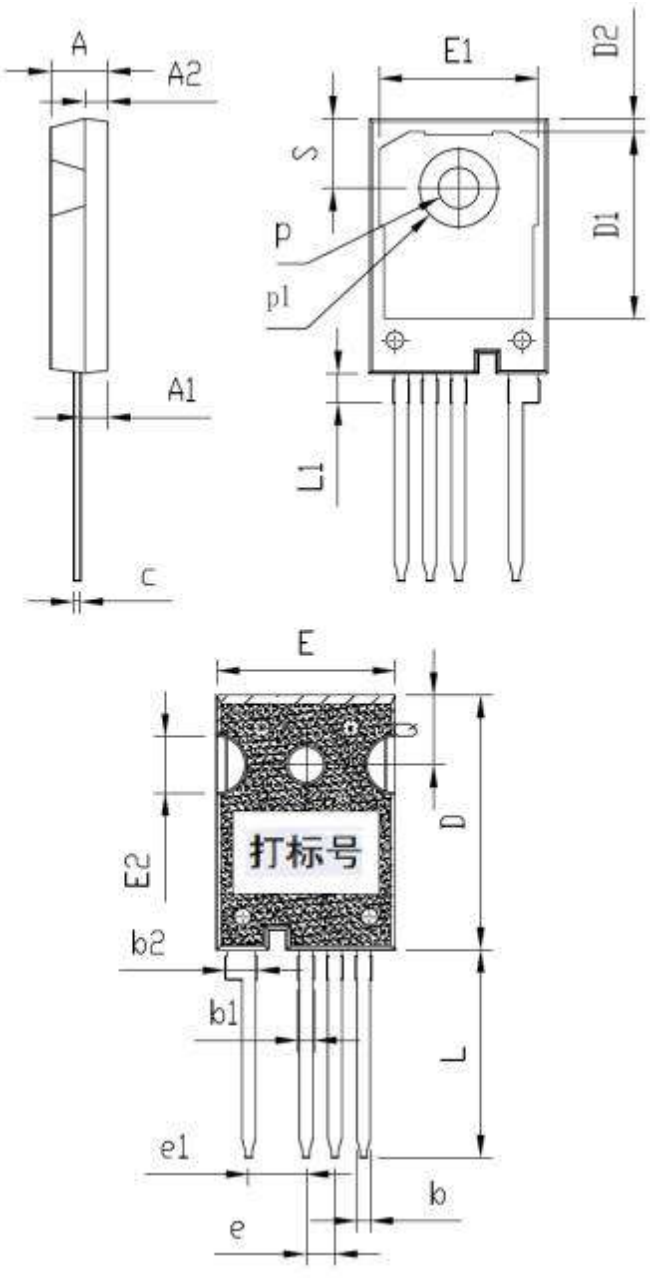


Figure 16. Capacitances vs. Drain-Source Voltage (0 - 1000V)

Package Dimensions

Package TO-247-4



SYMBOLS	DIMENSIONS IN MILLMETERS		
	MIN	NOM	MAX
A		5.00	
A1		2.40	
A2		2.00	
b		1.20	
b1		1.30	
b2		2.65	
c		0.6	
D		22.54	
D1		16.50	
D2		1.17	
e		2.54	
e1		5.08	
E		15.80	
E1		14.00	
E2		5.00	
L		18.38	
L1		2.58	
p		3.60	
p1		6.80	
Q		6.15	
S		6.15	

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   b.support or sustain life,
   c.whose failuer to when properly used in accordance with instructions for used provided in the laeling,can be reasonably expected to result in significant injury to the user.

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