

<b>VDS</b>	<b>RDS(on)</b>	<b>ID@25°C</b>
1200V	40mΩ	68A

**Applications:**

- Solar Inverters
- Switch Mode Power Supplies
- High Voltage DC/DC Converters
- EV Charging
- Motor Drives

**Features:**

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

**Benefits:**

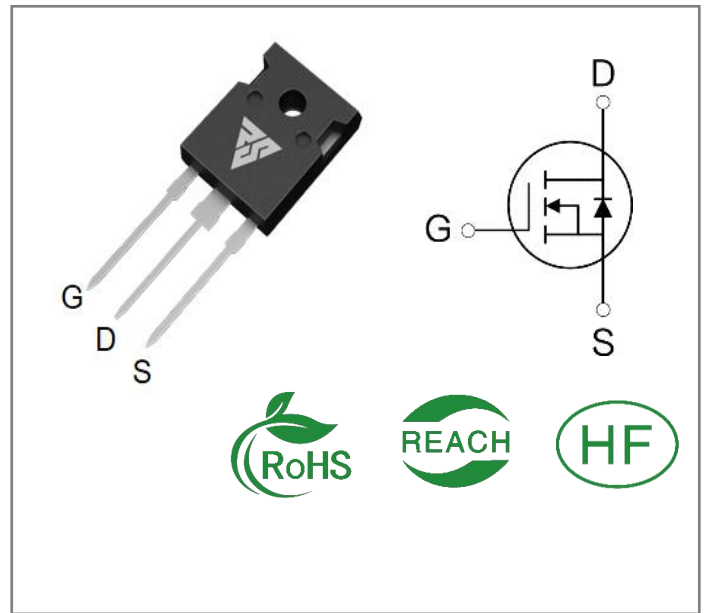
- Higher System Efficiency
- Reduced Cooling Requirements
- Increased Power Density
- Increased System Switching Frequency

**Ordering Information**

Part Number	Package	Marking	Packing	Qty.
RSM120040W	TO-247-3	RSM120040W	Tube	30 PCS

**Maximum Ratings** (TJ= 25°C unless otherwise specified)

Symbol	Parameter	Value	Unit	Test Conditions	Note
VDSmax	Drain - Source Voltage	1200	V	VGS=0V, ID =100μA	
VGSmax	Gate - Source Voltage	-8/+22	V	Absolute maximum values	
VGSop	Gate - Source Voltage	-4/+18	V	Recommended operational values	
ID	Continuous Drain Current	68 49	A	VGS=18V, TC =25°C VGS=18V, TC =100°C	
ID(pulse)	Pulsed Drain Current	100	A	Pulse width tp limited by TJmax	
PD	Power Dissipation	340	W	TC =25°C, TJ =175°C	
TL	Solder Temperature	260	°C		
TJ, Tstg	Operating Junction and Storage Temperature	-40 to +175	°C		



**Electrical Characteristics** (T<sub>J</sub>= 25°C unless otherwise specified)

Symbol	Parameter	Min.	Typ.	Max.	Unit	Test Conditions	Note
V(BR)D SS	Drain-Source Breakdown Voltage	120 0			V	V <sub>GS</sub> =0V, I <sub>D</sub> =100μA	
V <sub>GS(th)</sub>	Gate Threshold Voltage	1.9	2.6	4.0	V	V <sub>GS</sub> = V <sub>DS</sub> , I <sub>DS</sub> =9.5mA, TC =25°C	
			1.8		V	V <sub>GS</sub> = V <sub>DS</sub> , I <sub>DS</sub> =9.5mA, TC =175°C	
I <sub>DSS</sub>	Zero Gate Voltage Drain Current		1	100	μA	V <sub>DS</sub> = 1200V, V <sub>GS</sub> =0V	
I <sub>GSS</sub>	Gate-Source Leakage Current		10	250	nA	V <sub>GS</sub> =22V, V <sub>DS</sub> = 0V	
R <sub>DS(on)</sub>	Drain-Source on-state Resistance		40	53	mΩ	V <sub>GS</sub> =18V, I <sub>D</sub> =33.3A, TC =25°C	
			65			V <sub>GS</sub> =18V, I <sub>D</sub> =33.3A, TC =175°C	
C <sub>iss</sub>	Input Capacitance		207 0		pF	V <sub>GS</sub> =0V, V <sub>DS</sub> =1000 V, f=1MHz, V <sub>AC</sub> =25 mV	
C <sub>oss</sub>	Output Capacitance		112				
C <sub>rss</sub>	Reverse Transfer Capacitance		11				
E <sub>ON</sub>	Turn-On Switching Energy		141 0		μJ	V <sub>DS</sub> =800V, V <sub>GS</sub> =-4/18V, I <sub>D</sub> = 33.3A, R <sub>G(ext)</sub> = 2.5Ω, L= 100μH	
E <sub>OFF</sub>	Turn-Off Energy		750				
t <sub>d(on)</sub>	Turn-On Delay Time		17		ns	V <sub>DS</sub> =800V, V <sub>GS</sub> =-4/18 V I <sub>D</sub> = 33.3A, R <sub>G(ext)</sub> =2. 5 Ω , R <sub>L</sub> =20Ω	
t <sub>r</sub>	Rise Time		58				
t <sub>d(off)</sub>	Turn-Off Delay Time		26				
t <sub>f</sub>	Fall Time		15				
R <sub>G(int)</sub>	Internal Gate Resistance		4.9				Ω
Q <sub>gs</sub>	Gate to Source Charge		34		nC	V <sub>DS</sub> =800V, V <sub>GS</sub> =-4/18V I <sub>D</sub> =33.3A	
Q <sub>gd</sub>	Gate to Drain Charge		20				
Q <sub>g</sub>	Total Gate Charge		121				

**Reverse Diode Characteristics** (T<sub>J</sub>= 25°C unless otherwise specified)

Symbol	Parameter	Typ.	Max	Unit	Test Conditions	Note
VSD	Diode Forward Voltage	4.5		V	VGS=-4V, ISD =20 A, T <sub>J</sub> = 25°C	
		4.2		V	VGS=-4V, ISD=20 A, T <sub>J</sub> = 175°C	
IS	Continuous Diode Forward Current		51	A	VGS=-4V, TC= 25°C	
trr	Reverse Recovery time	38		ns	ISD= 33.3 A, VR = 800V	
Qrr	Reverse Recovery Charge	109		nC		
Irrm	Peak Reverse Recovery Current	5		A		

**Thermal Characteristics** (T<sub>J</sub>= 25°C unless otherwise specified)

Symbol	Parameter	Typ.	Unit	Test Conditions	Note
R <sub>θJC</sub>	Thermal Resistance from Junction to Case	0.44	°C/W		
R <sub>θJA</sub>	Thermal Resistance From Junction to Ambient	40			

Typical Feature Curve

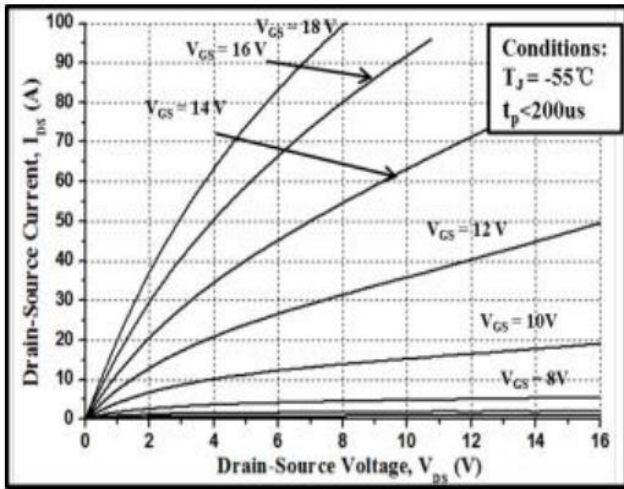


Figure 1. Output Characteristics  $T_J = -55^\circ\text{C}$

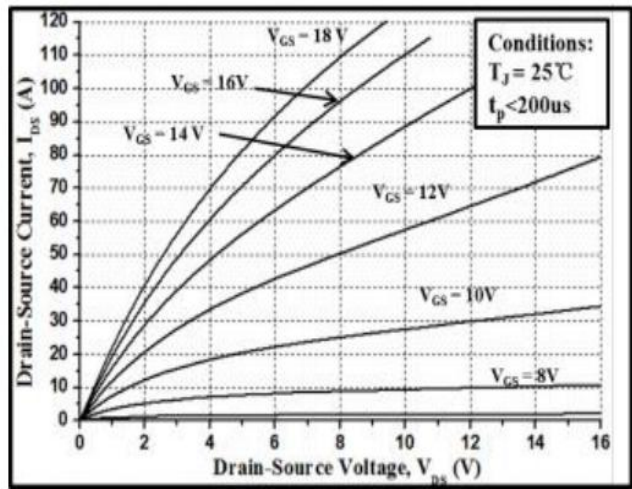


Figure 2. Output Characteristics  $T_J = 25^\circ\text{C}$

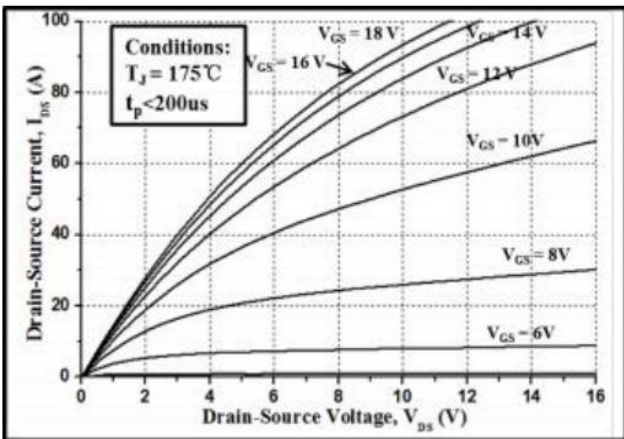


Figure 3. Output Characteristics  $T_J = 175^\circ\text{C}$

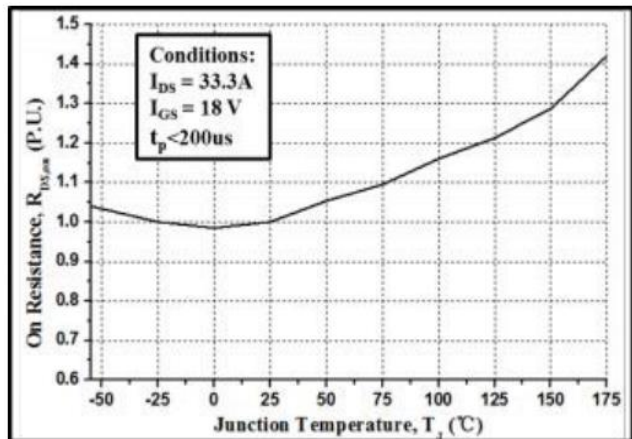


Figure 4. Normalized On-Resistance vs. Temperature

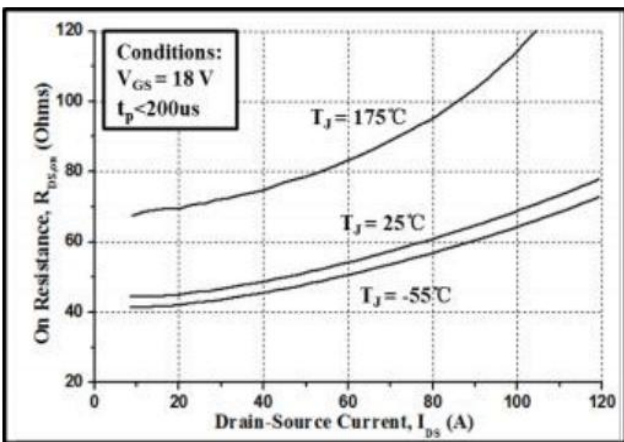


Figure 5. On-Resistance vs. Drain Current  
For Various Temperatures

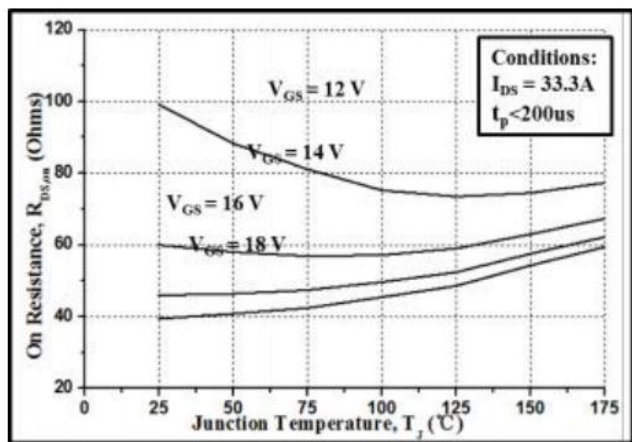


Figure 6. On-Resistance vs. Temperature  
For Various Gate Voltage

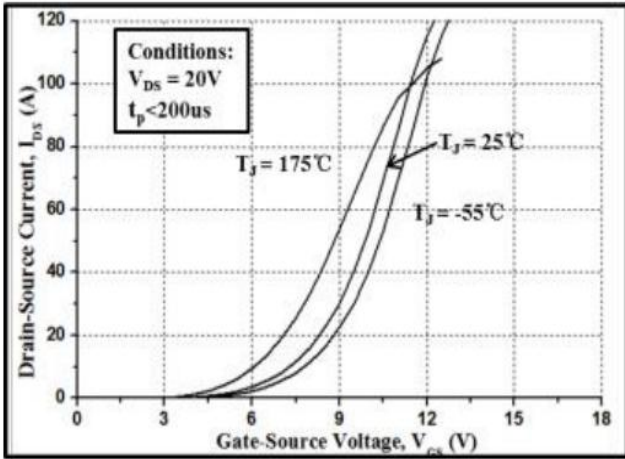


Figure 7. Transfer Characteristic for Various Junction Temperatures

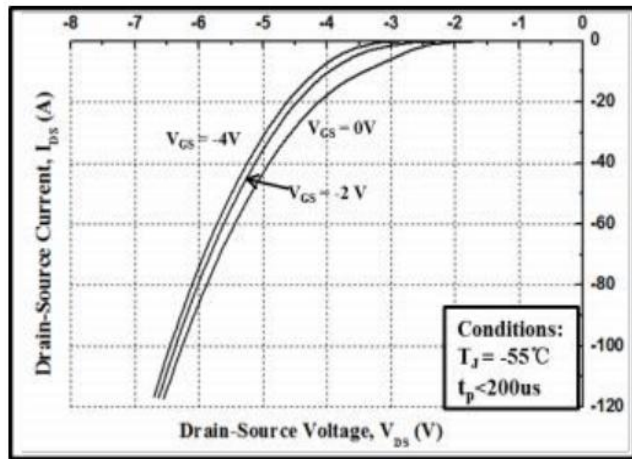


Figure 8. Body Diode Characteristic at -55°C

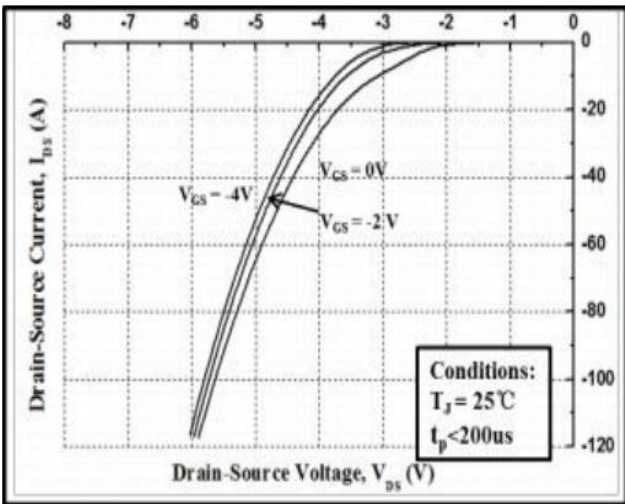


Figure 9. Body Diode Characteristic at 25°C

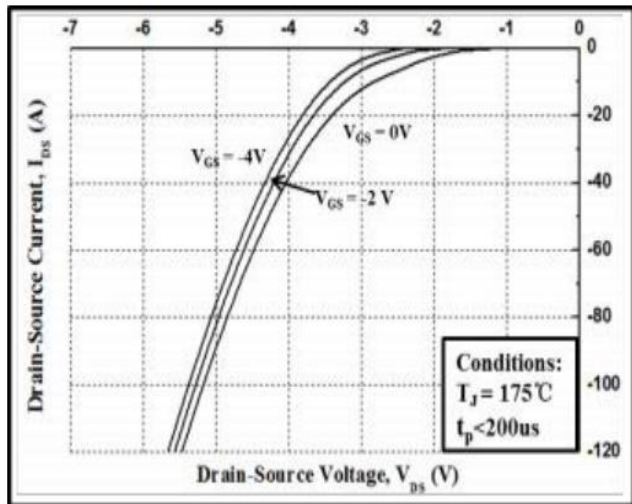


Figure 10. Body Diode Characteristic at 175°C

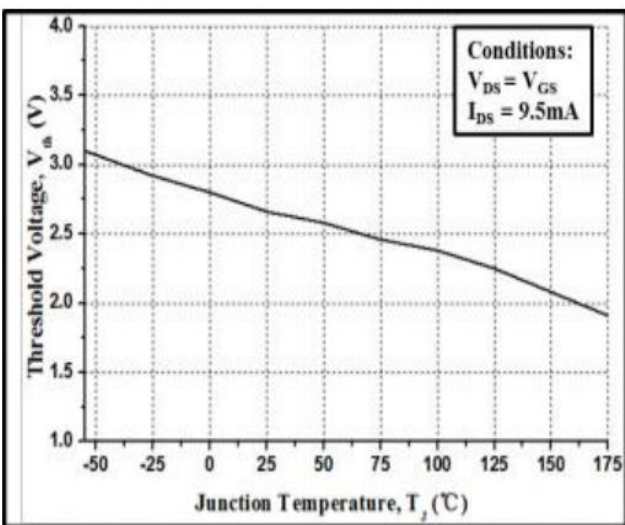


Figure 11. Threshold Voltage vs. Temperature

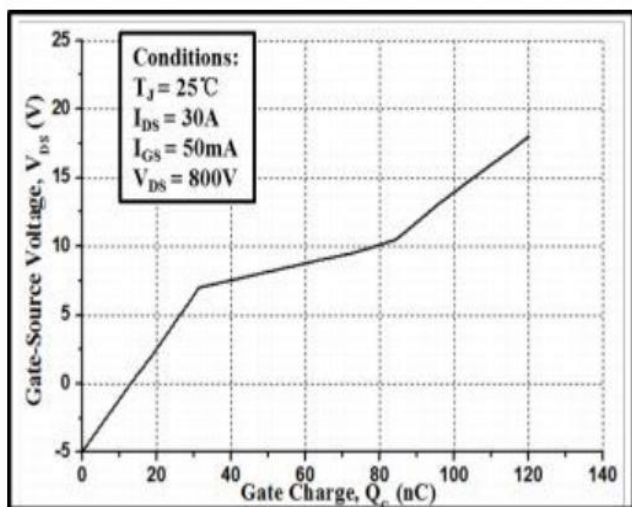


Figure 12. Gate Charge Characteristics

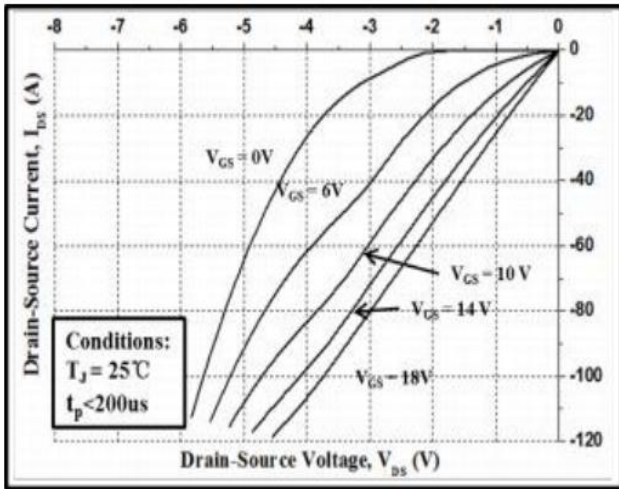


Figure 13. 3rd Quadrant Characteristic at 25°C

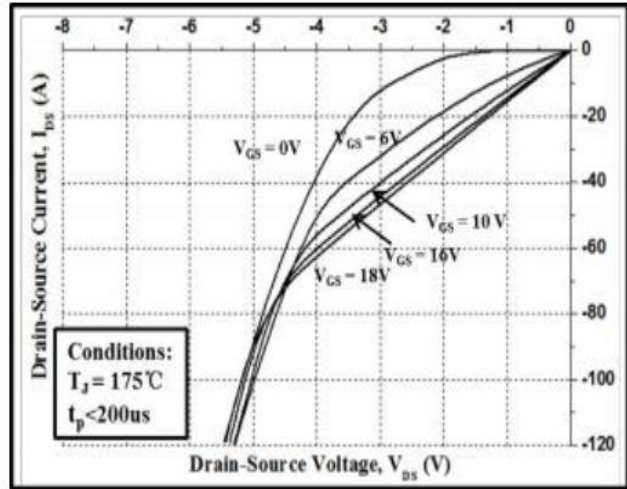


Figure 14. 3rd Quadrant Characteristic at 175°C

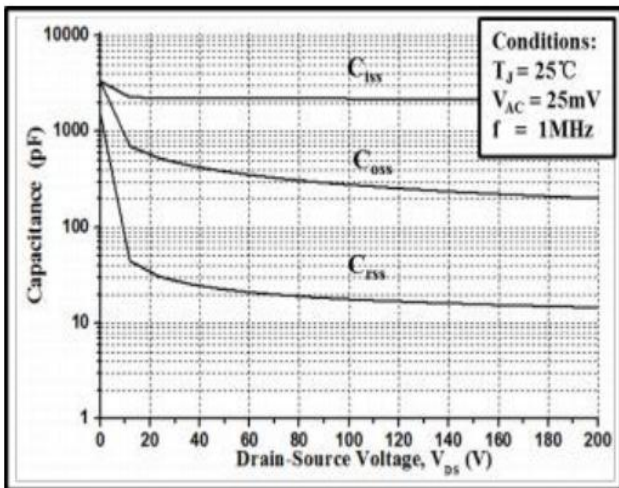


Figure 15. Capacitances vs. Drain-Source Voltage (0 - 200V)

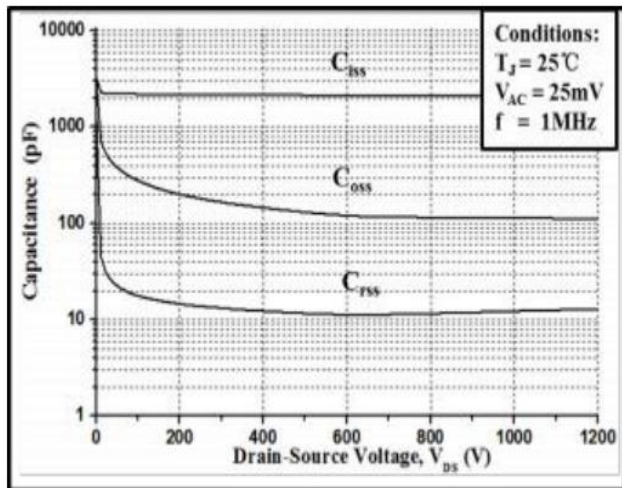
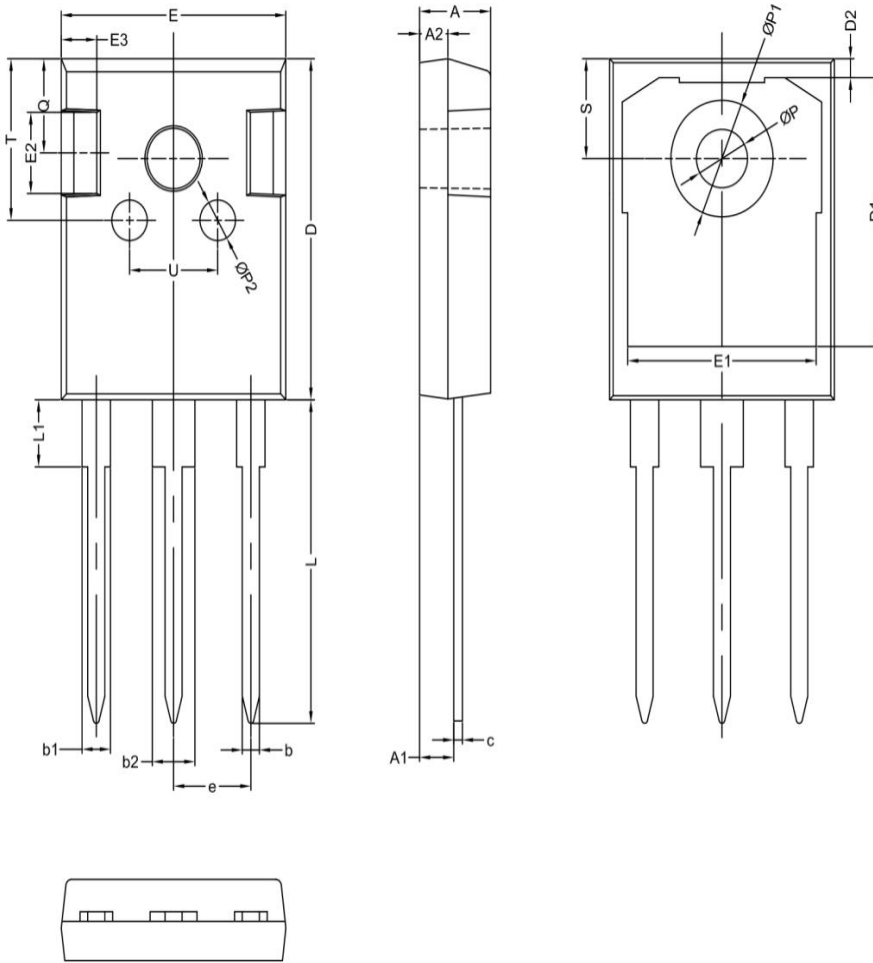


Figure 16. Capacitances vs. Drain-Source Voltage (0 - 1200V)

Package outline drawing(TO-247-3 Unit: mm)



符号	机械尺寸/mm		
	最小值	典型值	最大值
A	4.80	5.00	5.20
A1	2.21	2.41	2.61
A2	1.90	2.00	2.10
b	1.10	1.20	1.35
b1		2.00	
b2		3.00	
c	0.55	0.60	0.75
D	20.80	21.00	21.20
D1		16.55	
D2		1.20	
E	15.60	15.80	16.0
E1		13.30	
E2		5.00	
E3		2.50	
e		5.44	
L	19.42	19.92	20.42
L1		4.13	
P	3.50	3.60	3.70
P1	-	-	7.40
P2		2.50	
Q		5.80	
S	6.05	6.15	6.25
T		10.00	
U		6.20	

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