

Features

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

Product Summary			
V _{DS}	R _{DS(on)} (mΩ) Typ	I _D (A)	Q _g (Typ)
1200V	40 @ 20V	60	142nc

Mechanical Data

- Case: TO-247 Package

TO-247
SC60N120P

Application

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



Ordering Information

Part No.	Package Type	Package	Quality(box)
SC60N120P	TO-247	Tube	300

Block Diagram

Pin Definition:

1. Gate
2. Drain
3. Source

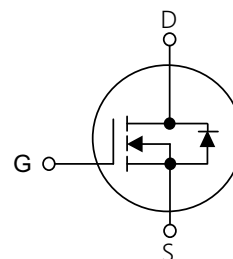


Table1 Absolute Maximum Ratings (T_C=25°C, unless otherwise specified)

Parameter	Symbol	Value	Unit
Drain-Source Voltage	V _{DS}	1200	V
Gate-Source Voltage _(Max)	V _{GS}	-10/+25	V
Gate-Source Voltage _(sop)	V _{GS}	-5/+20	V
Continuous Drain Current	I _D	T _C =25°C	60
		T _C =100°C	40
Pulsed Drain Current (Note 1)	I _{DM}	160	A
Power Dissipation	P _D	T _C =25°C	330
		T _J =150°C	
Operating Junction and Storage Temperature	T _J /T _{STG}	-55 ~ +150	°C

Table 2. Thermal Characteristics

Parameter	Symbol	TO-247	Unit
Thermal resistance Junction to Ambient	$R_{\theta JA}$	40	$^{\circ}\text{C}/\text{W}$
Thermal resistance Junction to Case	$R_{\theta JC}$	0.34	$^{\circ}\text{C}/\text{W}$

Table 3. Electrical Characteristics ($T_J=25^{\circ}\text{C}$, unless otherwise specified)

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Off Characteristics						
Drain-Source Breakdown Voltage	BV_{DSS}	$V_{GS}=0V, I_D=250\mu\text{A}$	1200	-	-	V
Drain-Source Leakage Current	I_{DSS}	$V_{DS}=1200V, V_{GS}=0V$	-	1	100	μA
Gate- Source Leakage Current	I_{GSS}	$V_{GS}=\pm 25V, V_{DS}=0V$	-	-	250	nA
		$V_{GS}=\pm 10V, V_{DS}=0V$	-	-	250	nA
On Characteristics(Note 4)						
Gate Threshold Voltage	$V_{GS(TH)}$	$V_{DS}=V_{GS}, I_D=10\text{mA}$	1.9	2.5	4.0	V
Static Drain-Source On-State Resistance	$R_{DS(ON)}$	$V_{GS}=20V, I_D=40\text{A}$	-	40	55	$\text{m}\Omega$
		$V_{GS}=20V, I_D=40\text{A}, T_J=150^{\circ}\text{C}$	-	80	-	
Dynamic Characteristics(Note 5)						
Input Capacitance	C_{ISS}	$V_{DS}=1000V, V_{GS}=0V, f=1\text{MHz}$	-	2946	-	pF
Output Capacitance	C_{OSS}		-	167	-	pF
Reverse Transfer Capacitance	C_{RSS}		-	6.6	-	pF
Switching Characteristics (Note 5)						
Turn-On Delay Time	$t_{d(on)}$	$V_{DS}=800V, I_D=40\text{A}(\text{Note 4})$ $V_{GS}=-5/20V$	-	12	-	ns
Turn-On Rise Time	t_R		-	10	-	ns
Turn-Off Delay Time	$t_{d(off)}$		-	25	-	ns
Turn-Off Fall Time	t_f		-	6.2	-	ns
Total Gate Charge	Q_G	$V_{DD}=800V, I_D=40\text{A},$ $V_{GS}=-5/20V$	-	142	-	nC
Gate-Source Charge	Q_{GS}		-	37	-	nC
Gate-Drain Charge	Q_{GD}		-	18	-	nC
Drain-Source Diode Characteristics and Maximum Ratings						
Drain-Source Diode Forward Voltage	V_{SD}	$V_{GS}=-5V, I_S=20\text{A}$		4.5		V
Maximum Continuous Drain-Source Diode Forward Current	I_S		-	-	62	A
Reverse Recovery Time	t_{rr}	$V_R=800V, I_F=20\text{A}$ $di_F/dt=100\text{A}/\mu\text{s}(\text{Note 1})$	-	41	-	ns
Reverse Recovery Charge	Q_{RR}		-	142	-	nC
Peak Reverse Recovery Charge	I_{rrm}		-	6	-	A

Notes : 1 Repetitive Rating:Pulse width limited by maximum junction temperature

4 Pulse Test: Pulse width $\leq 300\mu\text{S}$, Duty cycle $\leq 2\%$

5 Guaranteed by design, not subject to production

Typical Characteristics Diagrams

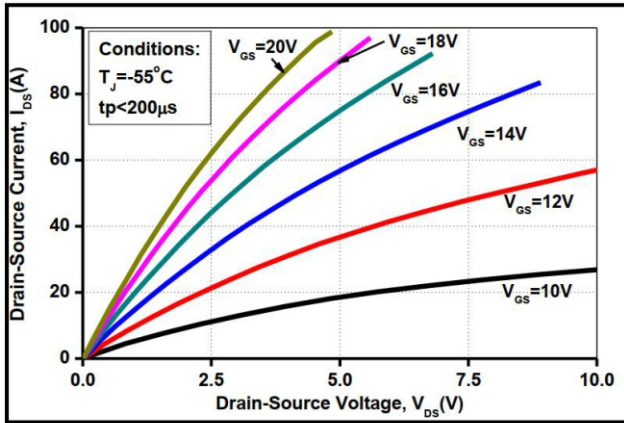


Figure 1. Output Characteristics $T_J = -55^\circ\text{C}$

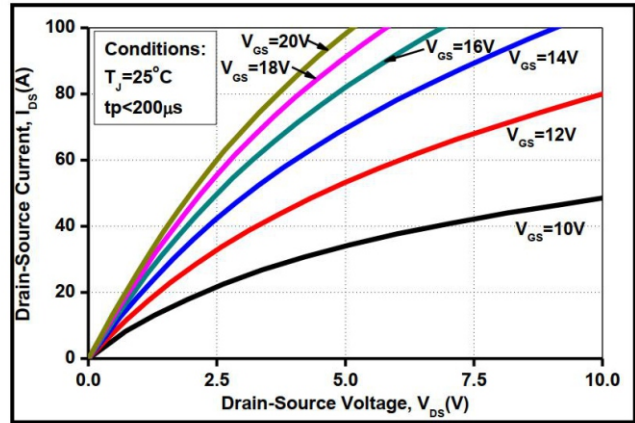


Figure 2. Output Characteristics $T_J = 25^\circ\text{C}$

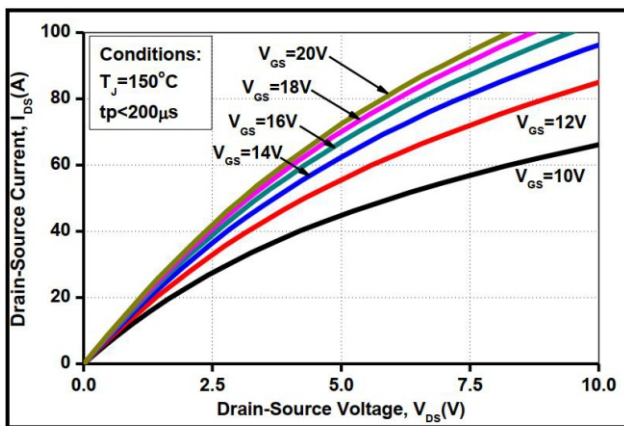


Figure 3. Output Characteristics $T_J = 150^\circ\text{C}$

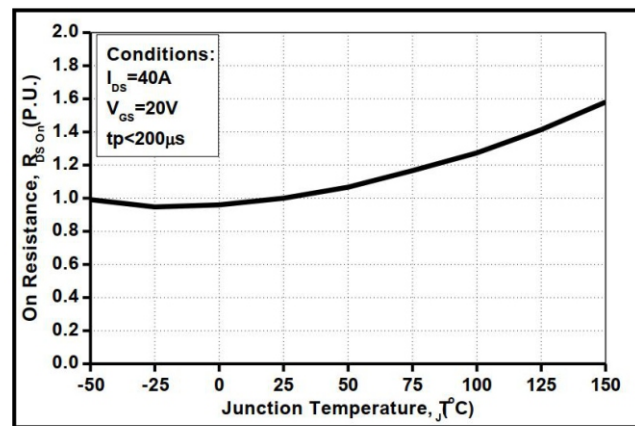


Figure 4. Normalized On-Resistance vs. Temperature

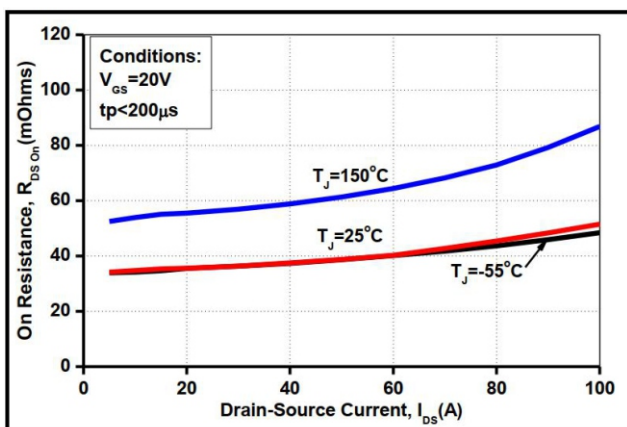


Figure 5. On-Resistance vs. Drain Current For Various Temperatures

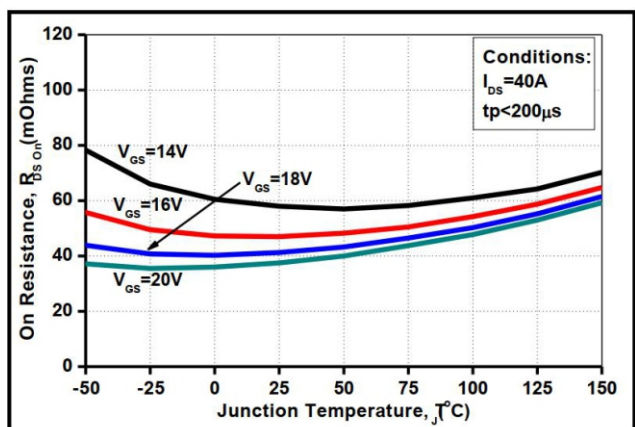


Figure 6. On-Resistance vs. Temperature For Various Gate Voltage

Typical Characteristics Diagrams

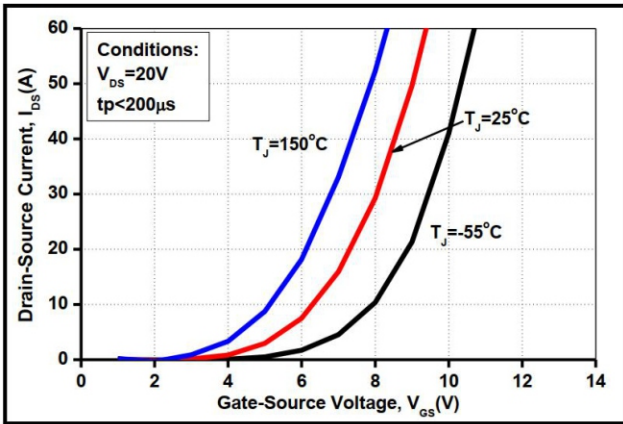


Figure 7. Transfer Characteristic for Various Junction Temperatures

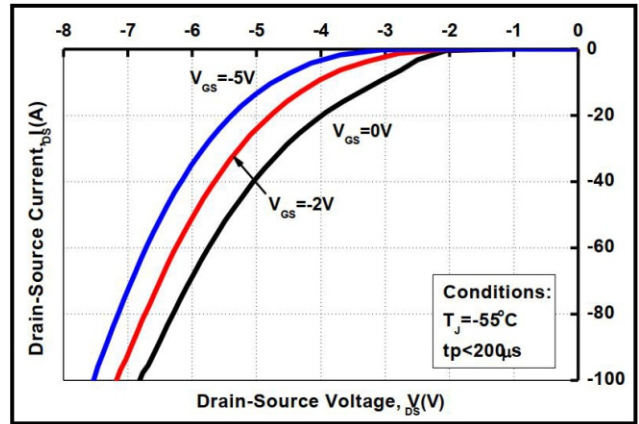


Figure 8. Body Diode Characteristic at -55 °C

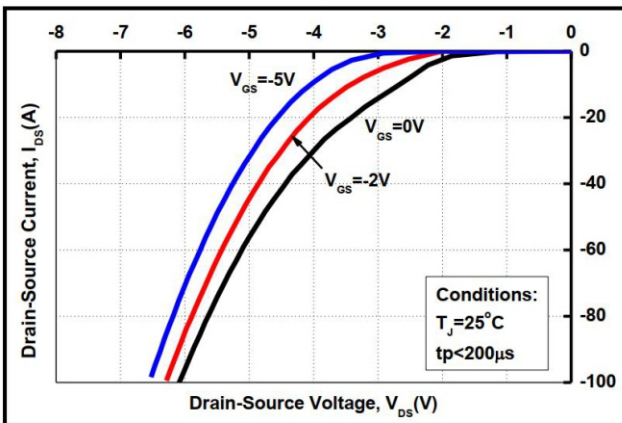


Figure 9. Body Diode Characteristic at 25 °C

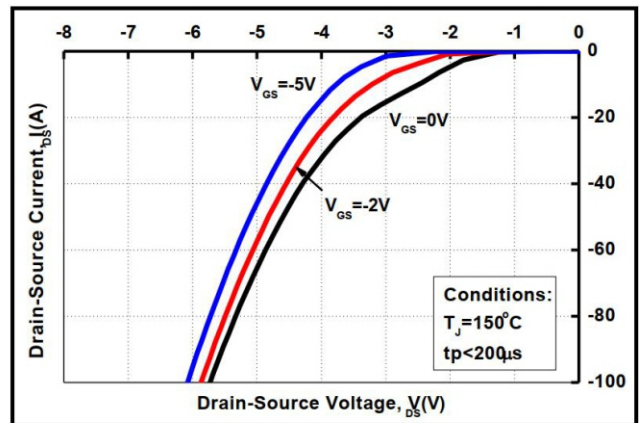


Figure 10. Body Diode Characteristic at 150 °C

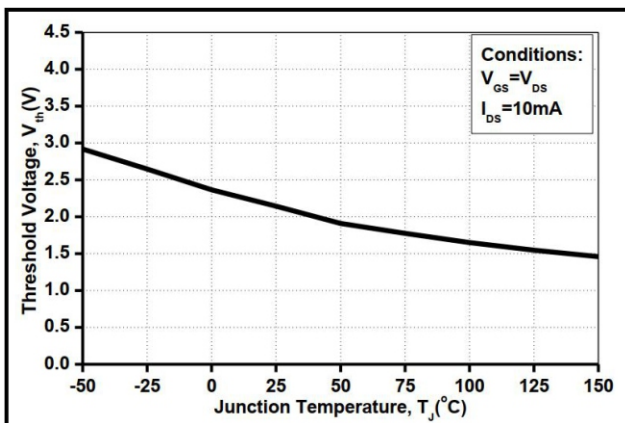


Figure 11. Threshold Voltage vs. Temperature

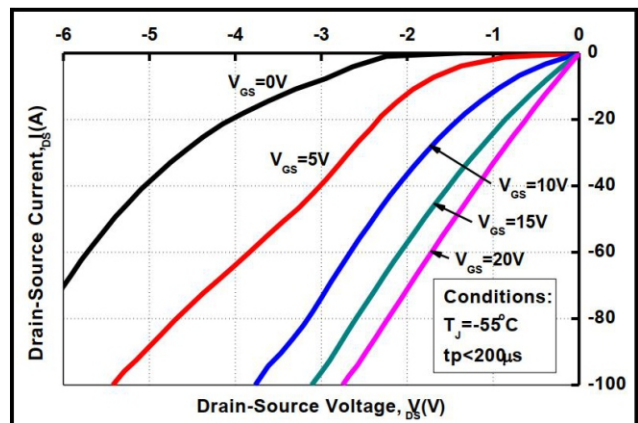


Figure 12. 3rd Quadrant Characteristic at -55 °C

Typical Characteristics Diagrams

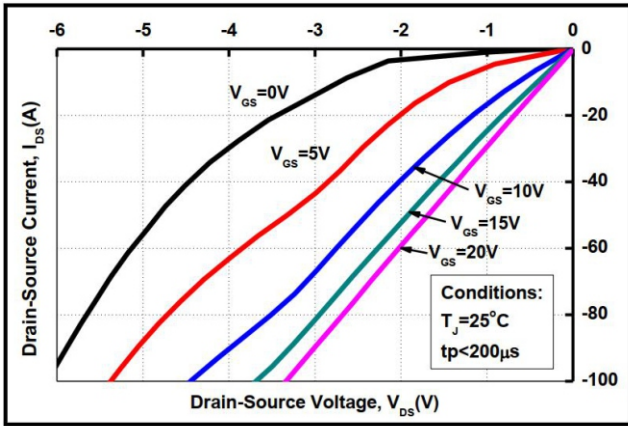


Figure 13. 3rd Quadrant Characteristic at 25 °C

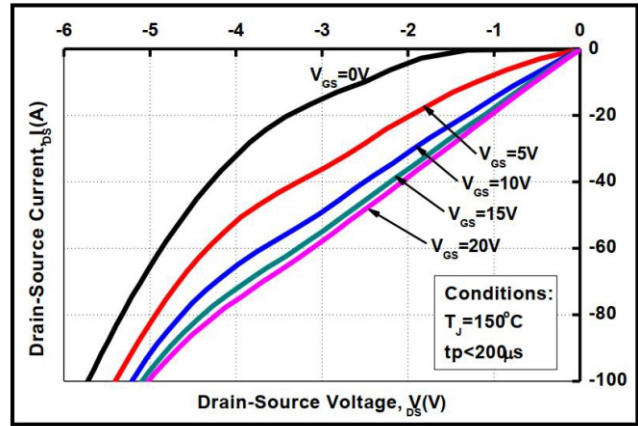


Figure 14. 3rd Quadrant Characteristic at 150 °C

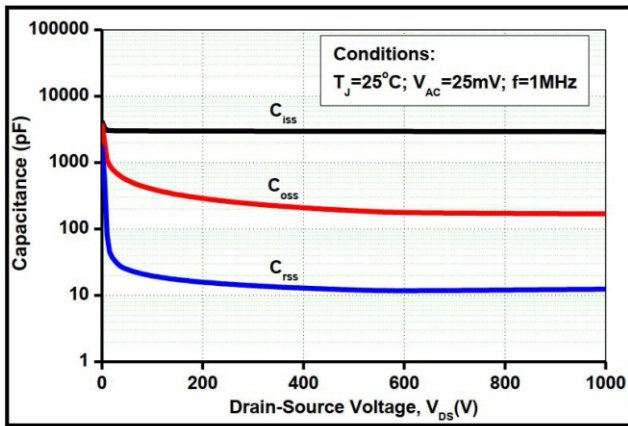


Figure 15. Capacitances vs. Drain-Source Voltage (0 - 200V)

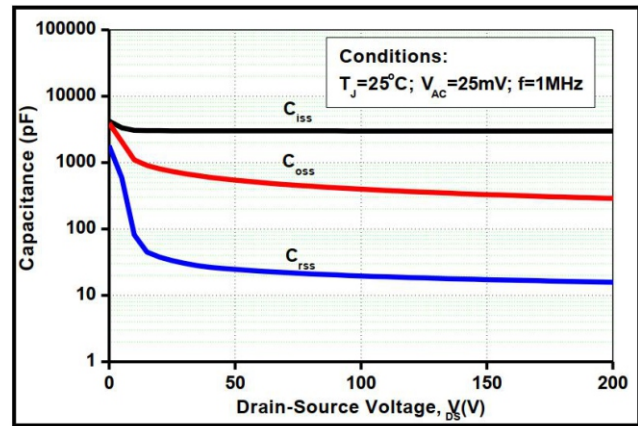
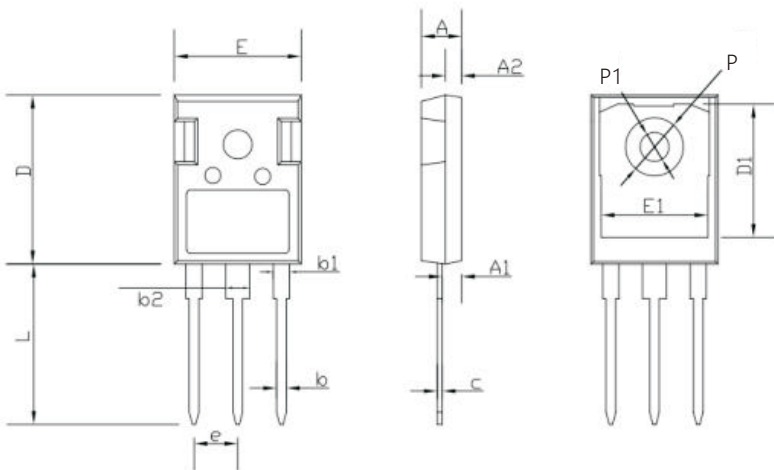


Figure 16. Capacitances vs. Drain-Source Voltage (0 - 1000V)

Dimensions

TO-247 PACKAGE OUTLINE DIMENSIONS



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	min.	max.	min.	max.
A	4.90	5.10	0.193	0.201
A1	2.31	2.51	0.091	0.099
A2	1.90	2.10	0.075	0.083
b	1.16	1.26	0.046	0.050
b1	1.96	2.06	0.0772	0.0812
b2	2.96	3.06	0.117	0.121
c	0.59	0.66	0.0232	0.0260
D	20.90	21.10	0.8235	0.8313
D1	16.25	16.85	0.6403	0.6639
E	15.70	15.90	0.6186	0.6265
E1	13.10	13.50	0.5161	0.5319
e	5.44		0.2143	
L	19.80	20.10	0.7801	0.7919
ΦP	3.50	3.70	0.1379	0.1458
ΦP1	0	7.30	0	0.2876

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