SEMICONDUCTOR

SC20N75TT

750V 110A N-Channel SIC Power MOSFET

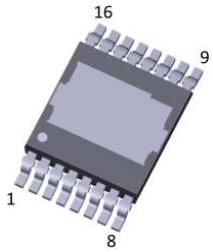
Features

- High blocking voltage with low on-resistance
- High speed switching with low capacitance
- Easy to Parallel
- Simple to Drive
- Robust against Parasitic Turn on Even 0V Turn off Gate Voltage

Product Summary			
V_{DS}	$R_{DS(on)}$(mΩ)Typ	I_D(A)	Qg(Typ)
750V	20 @ 18V 60A	110	125nc

TOLT

SC20N75TT





Mechanical Data

- Case:TOLT Package

Application

- Switch Mode Power Supplies
- High Voltage DC/DC Converters
- Battery Chargers
- Motor Drives

Block Diagram

Pin Definition:

1-6. Source
7.Driver Source
8. Gate
9-16,Tab. Drain

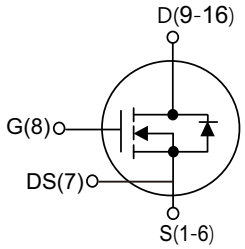


Table1 Absolute Maximum Ratings (T_C=25°C, unless otherwise specified)

Parameter		Symbol	Value	Unit
Drain-Source Voltage		V_{DS}	750	V
Gate-Source Voltage(Max)		$V_{GS(max)}$	-10/+22	V
Recommend Gate-Source Voltage		V_{GSop}	-0/+18	V
Continuous Drain Current	T_C=25°C	I_D	110	A
	T_C=100°C		78	
Pulsed Drain Current (Note 1)		I_{DM}	197	A
Power Dissipation	T_C=25°C	P_D	220	W
Operating Junction and Storage Temperature		T_J/T_{STG}	-55 ~ +175	°C

Table 2.Thermal Characteristics

Parameter	Symbol	SC20N75TT	Unit
Thermal resistance Junction to Case	$R_{\theta JC}$	0.45	°C/W
Thermal resistance Junction to Ambient	$R_{\theta JA}$	40	°C/W

Table 3. Electrical Characteristics (T_J=25°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=0.5mA	750	-	-	V
Drain-Source Leakage Current		I_{DSS}	V_{DS}=750V,V_{GS}=0V	-	1	50	μA
Gate- Source Leakage Current	Forward	I_{GSS}	V_{GS}=22V,V_{DS}=0V	-	-	250	nA
	Reverse		V_{GS}=-10V,V_{DS}=0V	-	-	-250	nA
On Characteristics							
Gate Threshold Voltage		$V_{GS(TH)}$	V_{DS}=V_{GS},I_D=23mA	2.7	-	4.5	V
Static Drain-Source On-State Resistance		$R_{DS(ON)}$	V_{GS}=18V,I_D=60A,T_J=25°C	-	20	26	mΩ
Gate Resisitance		R_G	f=1MHz	-	1.3	-	Ω
Dynamic Characteristics							
Input Capacitance		C_{ISS}	V_{DS}=500V,V_{GS}=0V, f=1MHz,V_{AC}=25mV	-	3200	-	pF
Output Capacitance		C_{OSS}		-	230	-	pF
Reverse Transfer Capacitance		C_{RSS}		-	20	-	pF
Turn-On Delay Time		td(on)	V_{DS}=500V,I_D=20A V_{GS}=18V,R_G=10Ω,	-	21	-	ns
Turn-On Rise Time		t_R		-	76	-	ns
Turn-Off Delay Time		td(off)		-	70	-	ns
Turn-Off Fall Time		tf		-	37	-	ns
Total Gate Charge		Q_G	V_{DD}=500V,I_D=60A, V_{GS}=18V	-	125	-	nC
Gate-Source Charge		Q_{GS}		-	35	-	nC
Gate-Drain Charge		Q_{GD}		-	17	-	nC
Drain-Source Diode Characteristics and Maximum Ratings(Note 2)							
Drain-Source Diode Forward Voltage		V_{SD}	V_{GS}=0V,I_S=30A	-	3.4	-	V
Continuous Diode Forward Current		I_S		-	-	110	A
Reverse Recovery Time		trr	V_R=500V, I_F=60A dI/dt = 400A/μs	-	35	-	ns
Recovered charge		Qrr		-	130	-	nC
Peak reverse recovery current		Irrm		-	6	-	A

Notes: 1 RepetitiveRating Pulse width limited by maximum junction temperature

2 Pulse Test: Pulse width ≤300μS,Duty cycle≤2%

Typical Characteristics Diagrams

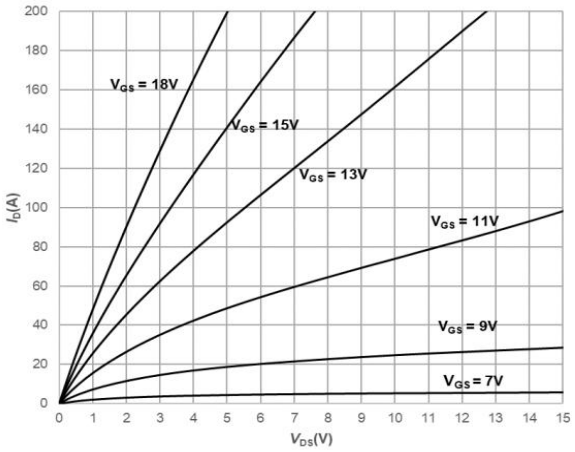


Fig.1 Typical Output Characteristics(T_J=25℃)

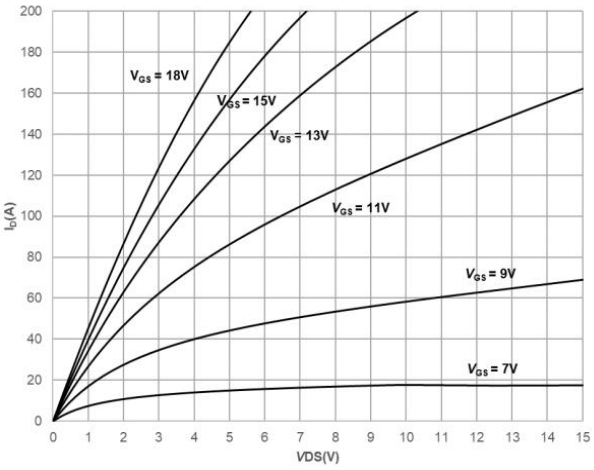


Fig.2 Typical Output Characteristics(T_J=175℃)

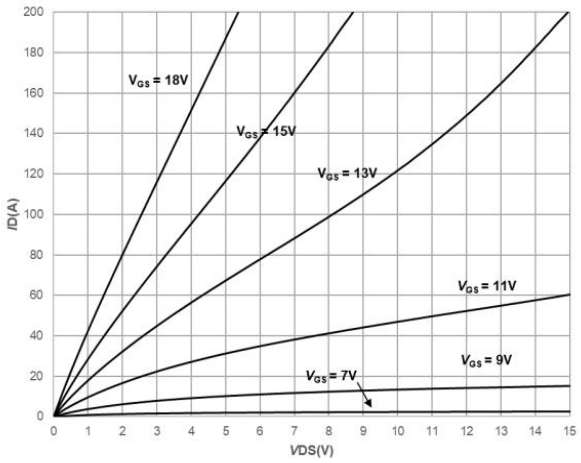


Fig.3 Typical Output Characteristics(T_J=-40℃)

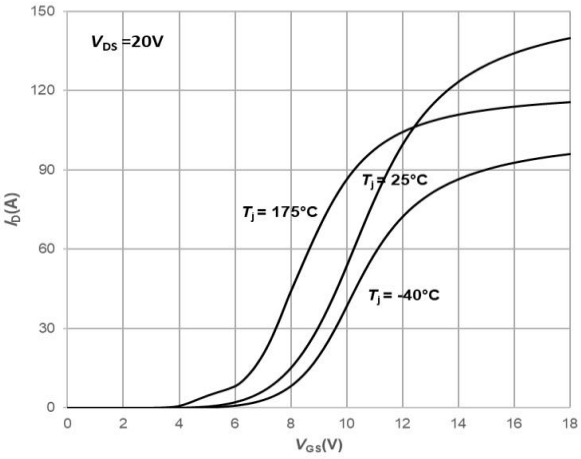


Fig.4 Typical Transfer Characteristics

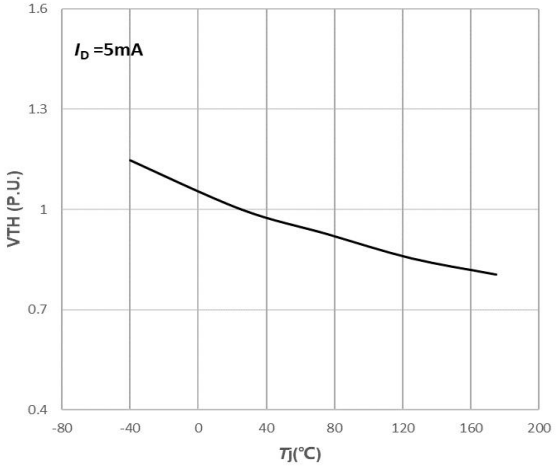


Fig.5 Normalized $V_{GS(th)}$ vs. T_J

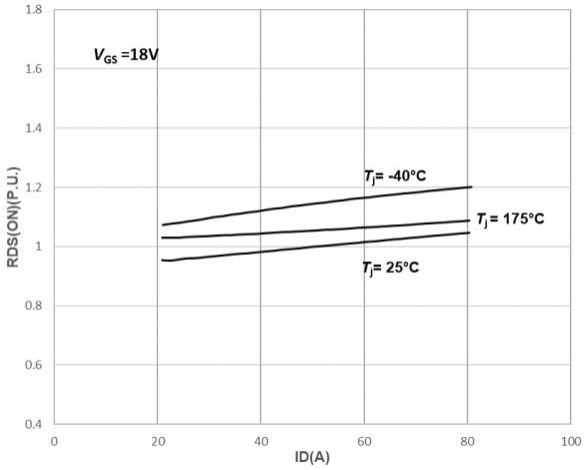


Fig.6 Normalized $R_{DS(ON)}$ vs. Drain Current

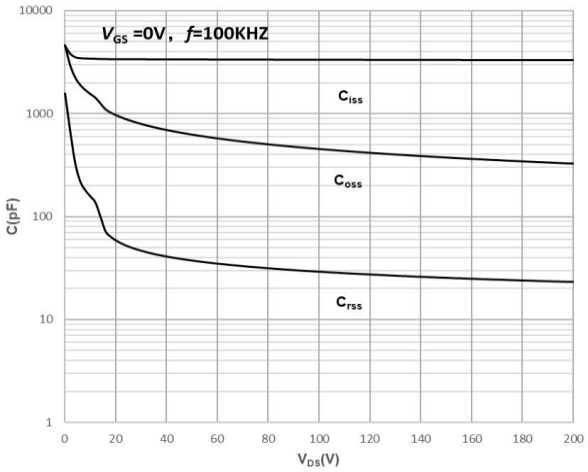


Fig.7 Capacitance(0~200V)

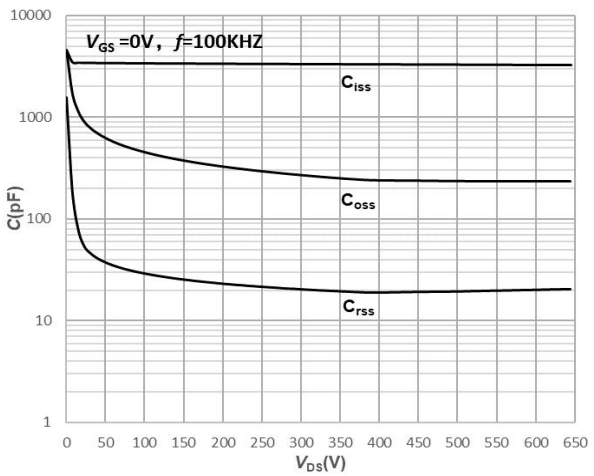


Fig.8 Capacitance(0~650V)

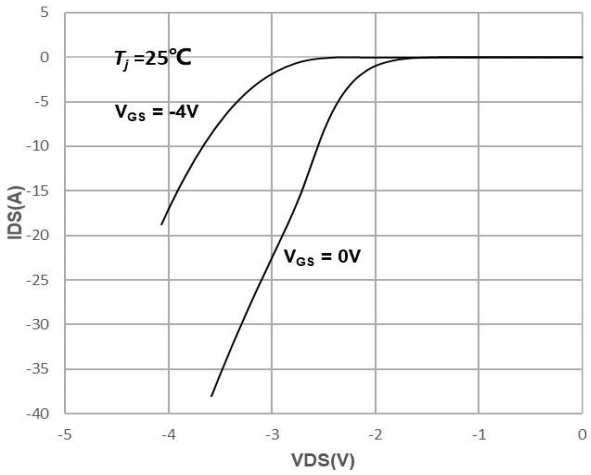


Fig.9 Body Diode Characteristics

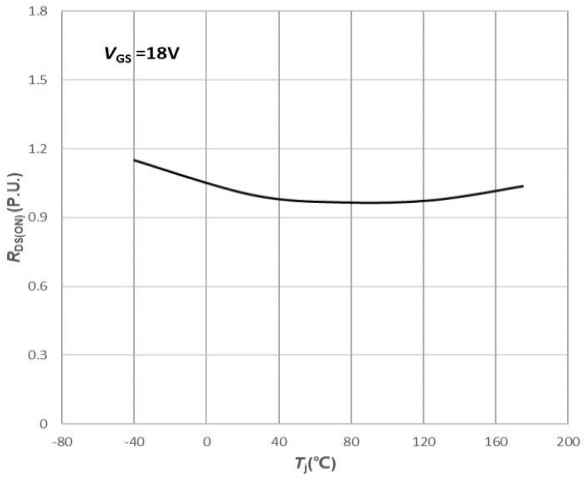
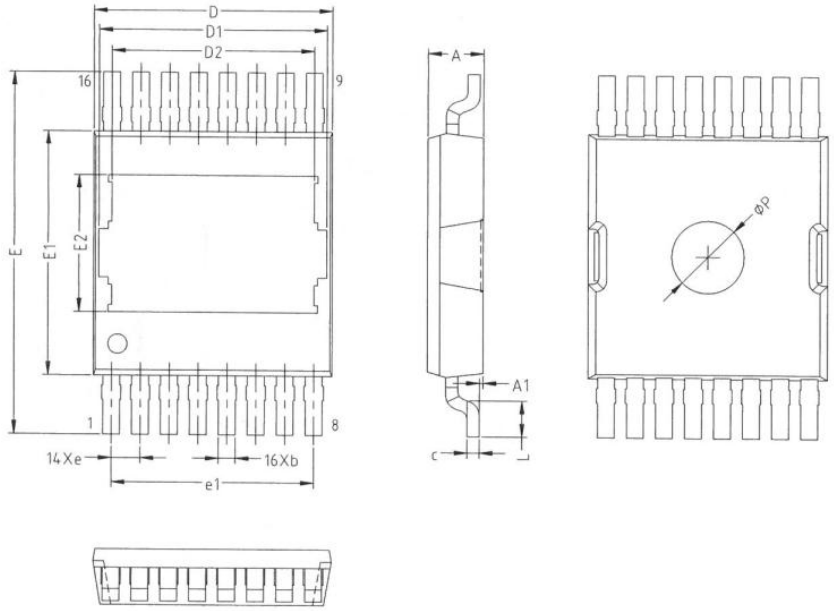


Fig.10 Normalized On-Resistance vs. T_J

Dimensions

TOLT package



SYMBOL	mm		
	MIN	NOM	MAX
A	2.25	2.30	2.35
A1	0.01	0.08	0.16
b	0.60	0.70	0.80
c	0.40	0.50	0.60
D	9.70	9.90	10.10
D1	9.46 REF		
D2	8.30	8.40	8.50
E	14.80	15.00	15.20
E1	10.00	10.10	10.30
E2	5.57	5.67	5.77
e	1.20 BSC		
e1	8.40 BSC		
L	1.40	1.50	1.60
P	2.90	3.00	3.10

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