

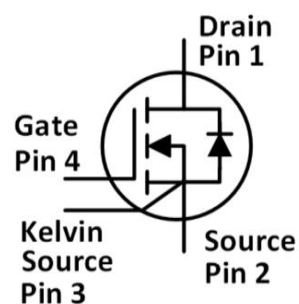
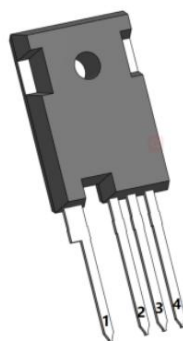
3300V N-Channel MOSFET

Description

Silicon Carbide (SiC) MOSFET use a completely new technology that provide superior switching performance and higher reliability compared to Silicon. In addition, the low ON resistance and compact chip size ensure low capacitance and gate charge. Consequently, system benefits include highest efficiency, faster operating frequency, increased power density, reduced EMI, and reduced system size.

Features

- High Speed Switching with Low Capacitances
- High Blocking Voltage with Low RDS(on)
- Optimized package with separate driver source pin
- Easy to parallel and simple to drive
- ROHS Compliant, Halogen free



Application

- EV motor drive
- High Voltage DC/DC Converters
- Switch Mode Power Supplies
- Solar inverters
- EV charging

Part Number	Marking	Package	Packaging
ASC60N3300MT4	ASC60N3300MT4	TO-247-4	Tube

Absolute Maximum Ratings(Tc=25℃)

Symbol	Parameter	Value	Unit
V _{DS}	Drain-Source Voltage	3300	V
I _D	Drain Current(continuous)at Tc=25℃	60	A
I _D	Drain Current(continuous)at Tc=100℃	40	A
I _{DM}	Drain Current (pulsed)	225	A
V _{GS}	Gate-Source Voltage	-10/+22	V
P _D	Power Dissipation T _C = 25℃	428	W
T _J , Tstg	Junction and Storage Temperature Range	-55 to +175	℃

Electrical Characteristics(T_J = 25℃ unless otherwise specified)
Typical Performance-Static

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
BV _{DS}	Drain-source Breakdown Voltage	I _D =250uA, V _{GS} =0V	3300			V
I _{DSS}	Zero Gate Voltage Drain Current	V _{DS} =3300V, V _{GS} =0V, T _J =25℃			100	uA
I _{GSS}	Gate-body Leakage Current	V _{DS} =0V ; V _{GS} =-10 to 20V			150	nA
V _{GS(th)}	Gate Threshold Voltage	V _{DS} = V _{GS} , I _D =20mA	2	3	4	V
V _{GS(on)}	Recommended turn-on Voltage	Static		18		V
V _{GS(off)}	Recommended turn-off Voltage			-5		V
R _{DS(on)}	Static Drain-source On Resistance	V _{GS} =18V, I _D =20A		58	75	mΩ
		V _{GS} =18V, I _D =20A T _J =175℃		98		mΩ

Typical Performance-Dynamic

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
C_{iss}	Input Capacitance	$V_{DS}=1000V, f=1MHz,$ $V_{AC}=25mV$		7305		pF
C_{oss}	Output Capacitance			128		pF
C_{rss}	Reverse Transfer Capacitance			12.5		pF
g_{fs}	Transconductance	$V_{DS}=10V, I_D=40A$		15		S
E_{oss}	C_{oss} Stored Energy	$V_{DS}=1000V, f=1MHz$		83.7		μJ
E_{ON}	Turn-On Energy (Body Diode)	$V_{DS}=1700V,$ $V_{GS}=-5V/18V, I_D=50A,$ $L=60\mu H, T_J=25^\circ C$		1234		μJ
E_{OFF}	Turn-Off Energy (Body Diode)			538		μJ
Q_g	Total Gate Charge	$V_{DS}=1000V,$ $V_{GS}=-5V/18V, I_D=40A,$		339		nC
Q_{gs}	Gate-source Charge			123		nC
Q_{gd}	Gate-Drain Charge			101		nC
$R_{G(int)}$	Internal Gate Resistance	$f=1MHz, V_{AC}=25mV$		1.5		Ω
$t_{d(on)}$	Turn-on Delay Time	$V_{DS}=1700V,$ $V_{GS}=-5V/18V,$ $I_D=50A, L=60\mu H$ $R_{ext}=3\Omega$		76		ns
t_r	Rise Time			38		ns
$t_{d(off)}$	Turn-off Delay Time			31		ns
t_f	Fall Time			17		ns

Typical Performance-Reverse Diode($T_J = 25^\circ C$ unless otherwise specified)

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
V_{FSD}	Forward Voltage	$V_{GS}=0V, I_F=10A, T_J=25^\circ C$		3.3	6	V
		$V_{GS}=0V, I_F=20A, T_J=175^\circ C$		3.1	6	V
I_S	Continuous Diode Forward Current	$V_{GS}=0V, T_C=25^\circ C$		55		A
t_{rr}	Reverse Recovery Time	$V_{GS}=-5V, I_F=50A,$ $V_R=1700V, di/dt=500$ $A/\mu s, T_J=175^\circ C$		178		nS
Q_{rr}	Reverse Recovery Charge			2838		nC
I_{rrm}	Peak Reverse Recovery Current			38		A

Thermal Characteristics

Symbol	Parameter	Value.	Unit
$R_{\theta JC}$	Thermal Resistance, Junction-to-Case	0.35	$^\circ C/W$
$R_{\theta JA}$	Thermal Resistance, Junction-to-Ambient	40	$^\circ C/W$

The values are based on the junction-to case thermal impedance which is measured with the device mounted to a large heat sink assuming maximum junction temperature of $T_J(max)=175^\circ C$

Electrical Characteristics

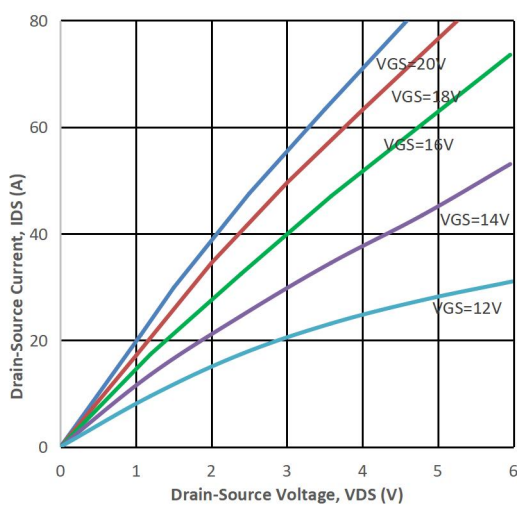
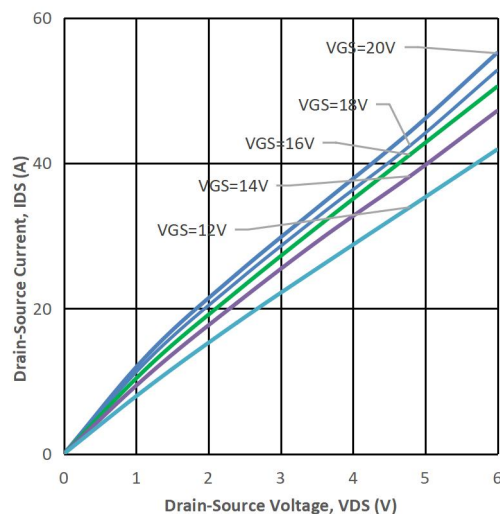
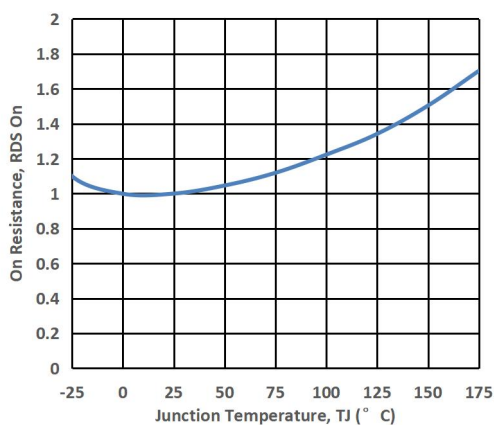
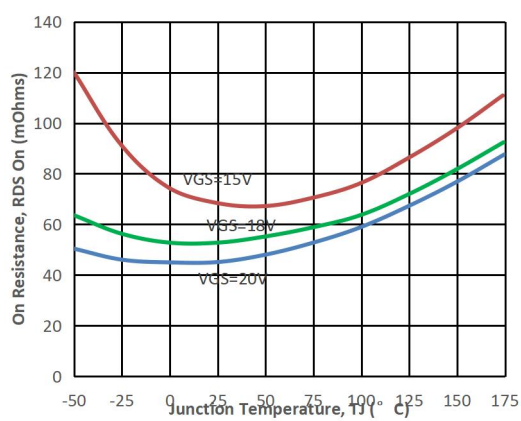
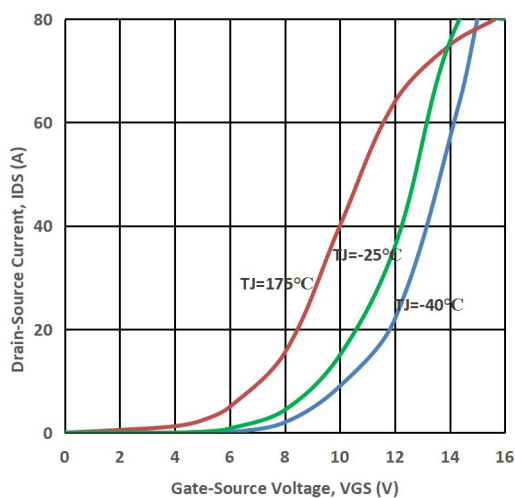
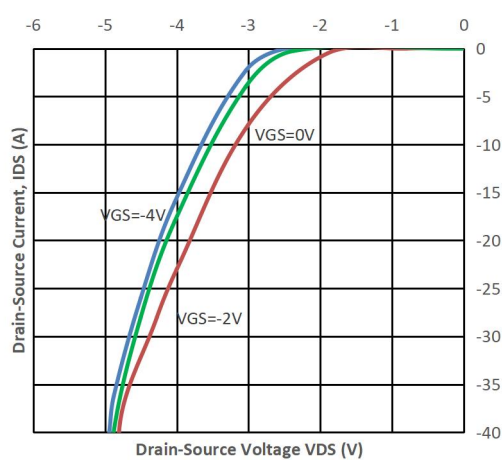
Fig1. Output characteristics ($T_J = 25^\circ\text{C}$)

Fig2. Output characteristics ($T_J = 175^\circ\text{C}$)

Fig3. Normalized On-Resistance vs. Temperature

Fig4. On-Resistance vs. Temperature

Fig5. Transfer Characteristic

Fig6. Body Diode Characteristic at 25°C


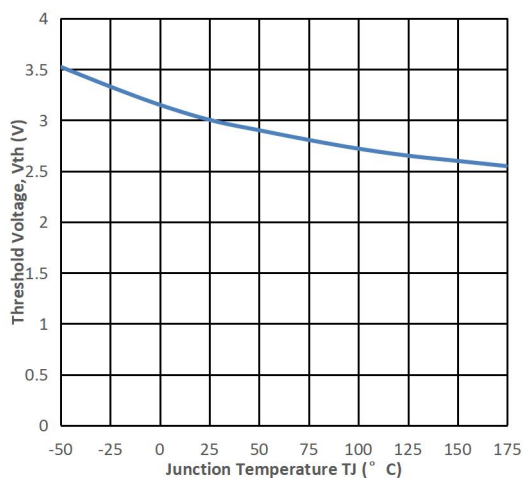
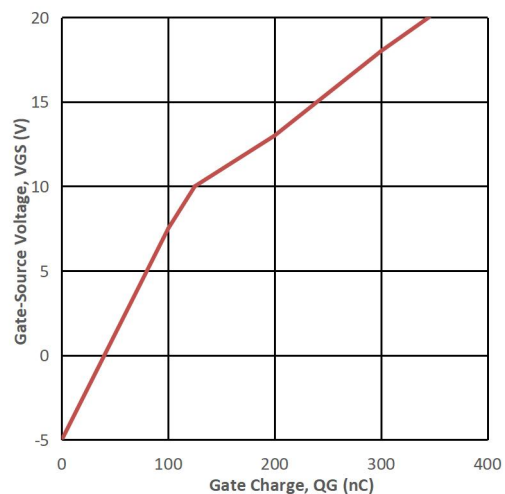
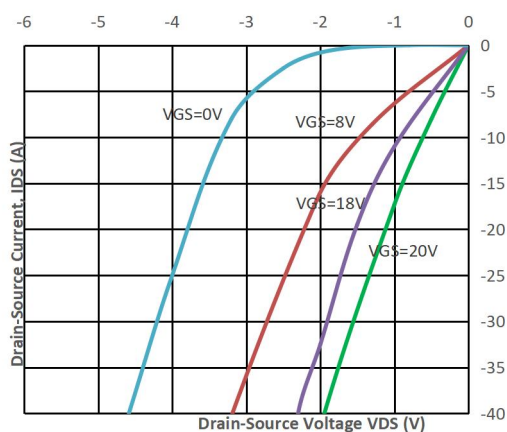
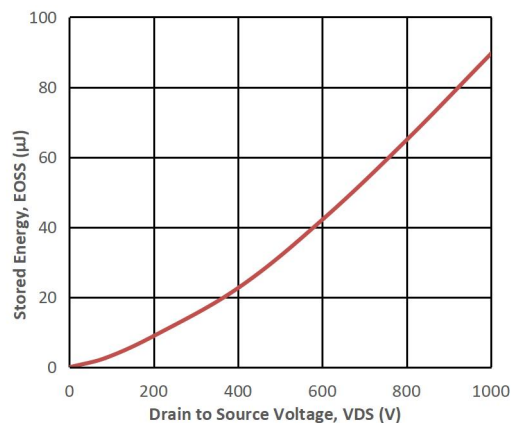
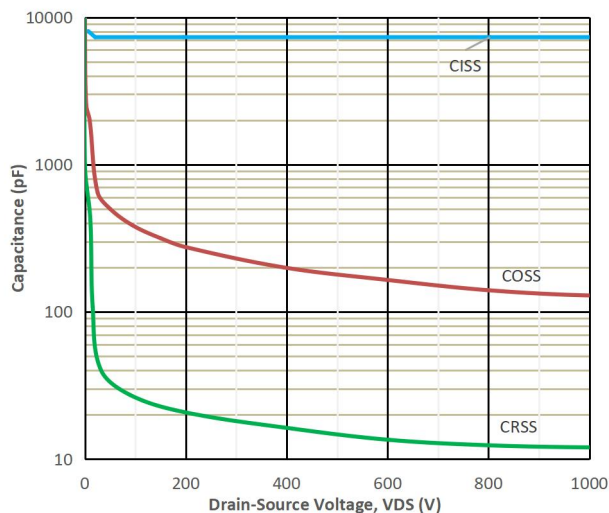
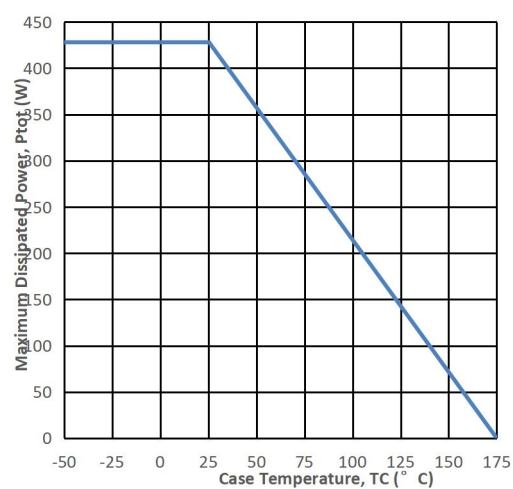
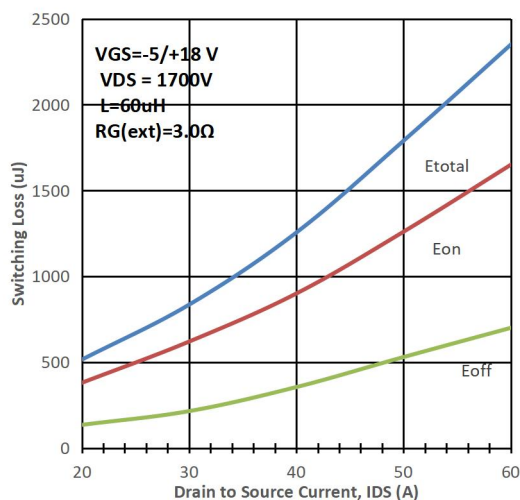
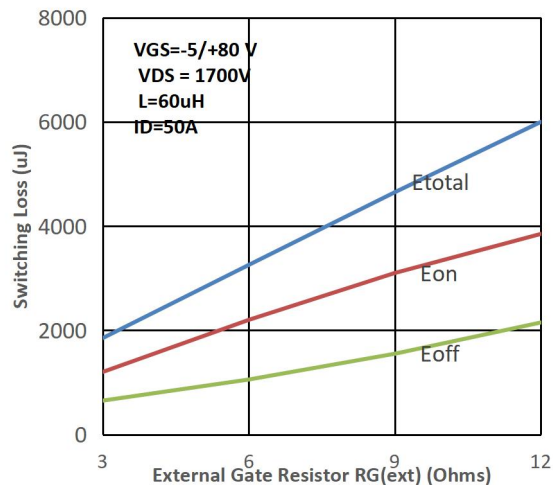
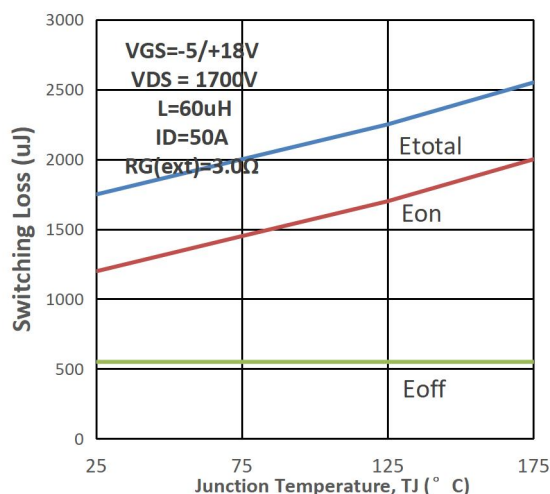
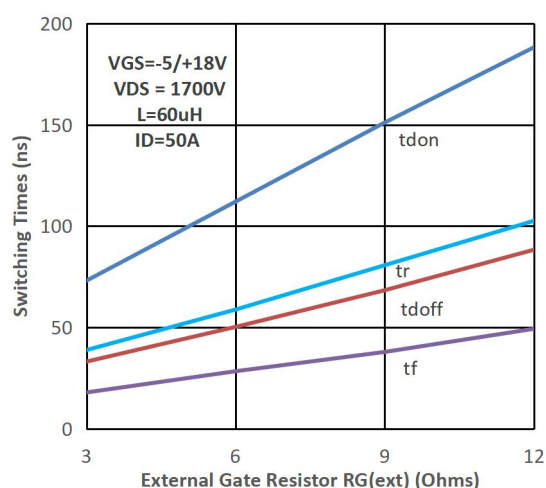
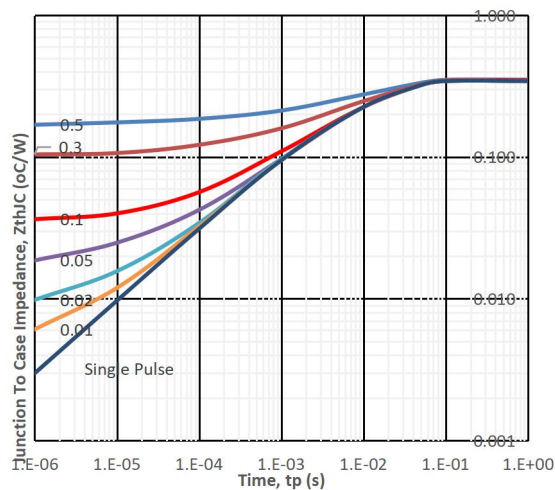
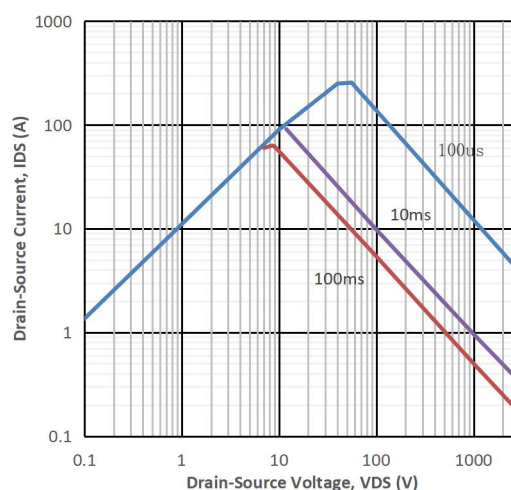
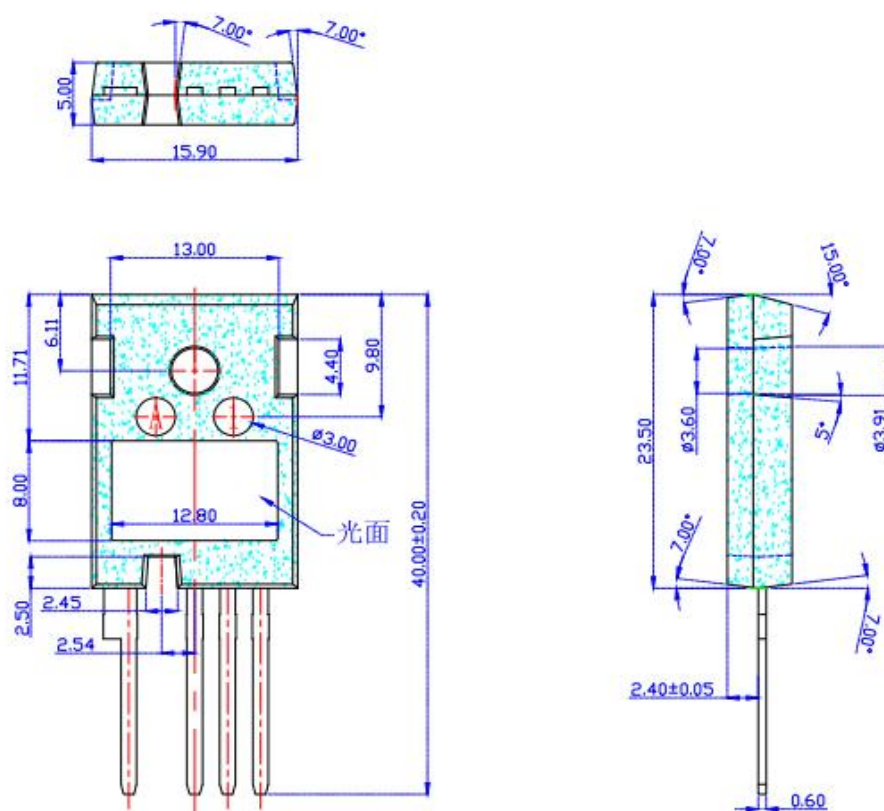
Fig7. Threshold Voltage vs. Temperature

Fig8. Gate Charge Characteristics

Fig9. 3rd Quadrant Characteristic at 25 °C

Fig10. Output Capacitor Stored Energy

Fig11. Capacitances vs. Drain-Source

Fig12. Max Power Dissipation Derating Vs Tc


Fig13. Switching Energy vs. Drain Current

Fig14. Switching Energy vs. RG(ext)

Fig15. Switching Energy vs. Temperature

Fig16. Switching Times vs. RG(ext)

Fig17. Transient Thermal Impedance

Fig18. Safe Operating Area


Dimensions(UNIT:mm)



Notes:

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