

Features

- High Temperature, Humidity, and Bias Operation
- Ultra Low Loss
- High-Frequency Operation
- Zero Turn-off Tail Current from MOSFET
- Normally-off, Fail-safe Device Operation
- Ease of Paralleling
- Integrated NTC temperature sensor
- Cu Baseplate and Aluminum Nitride Insulator

Potential Applications

- High power converters
- Motor drives
- Servo drives
- UPS systems
- Wind turbines

Package 152mm x 62.5mm x 20.5mm

Part Number	Package	Marking
ASC800N1200MED	Econodual	ASC800N1200MED

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

Symbol	Parameter	Value	Unit
V _{DS}	Drain-Source Voltage	1200	V
V _{GS}	Gate-Source Voltage(dynamic)	-10/+25	V
I _D	Drain Current	800	A
I _{DM}	Drain Current (pulsed)	1600	A
P _D	Power Dissipation T _C = 25°C	960	W
T _C ,T _{stg}	Operating and Storage Temperature Range	-40 to +150	°C
T _J	Junction Temperature	175	°C
L _{Stray}	Stray Inductance	20	nH

Electrical Characteristics (T_C = 25°C unless otherwise specified)

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
BV _{DS}	Drain-source Breakdown Voltage	V _{GS} =0V	1200			V
I _{DSS}	Zero Gate Voltage Drain Current	V _{DS} =1200V, V _{GS} =0V			800	uA
I _{GSS}	Gate-body Leakage Current	V _{GS} =-10/20V, V _{DS} =0V			8	uA
V _{GS(th)}	Gate Threshold Voltage	V _{DS} = V _{GS} , I _D =80mA	2.0		4.0	V
R _{DS(on)}	Static Drain-source On Resistance	V _{GS} =20V, I _D =400A		2.2	2.8	mΩ
R _G	Gate Resistance	V _{GS} =0V, f=1MHz		3.0		Ω
C _{iss}	Input Capacitance	V _{DS} =800V, f=100kHz, V _{AC} =25mV		51		nF
C _{oss}	Output Capacitance			1.97		
C _{rss}	Reverse Transfer Capacitance			120		
E _{on}	Turn-on energy loss per pulse	V _{DD} =600V, V _{GS} =-5/+20V I _D =400A, R _{G(ext)} =5Ω		19.3		mJ
E _{off}	Turn-off energy loss per pulse	Load=77uH, T _J =25°C		18.1		mJ
Q _{GS}	Gate-Source Charge	V _{DD} =1000V, V _{GS} =-5/+20V I _D =600A,		537		nC
Q _{GD}	Gate-Drain Charge			548		
Q _G	Total Gate Charge			1666		
t _{d(on)}	Turn-on delay time	V _{DD} =600V, V _{GS} =-5/+20V I _D =300A, R _{G(ext)} =5Ω Load=77uH, T _J =150°C		76		nS
t _r	Rise Time			69		
t _{d(off)}	Turn-off delay time			165		
t _f	Fall Time			42		
V _{sd}	Diode Forward voltage	I _f =400A, V _{GS} =0			6	V

Typical Performance-Reverse Diode(T_J = 25 °C unless otherwise specified)

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
V _{FSD}	Forward Voltage	V _{GS} =0V, I _F =400A, T _J =25°C			6	V
I _S	Continuous Diode Forward Current	V _{GS} =0V, T _J =25°C		400		A
I _{Spulse}	Pulsed body diode current			800		A
t _{rr}	Reverse Recovery Time	V _{GS} =-5V, I _F =400A, V _R =800V, di/dt=7.2k A/μs T _J =25°C		98		ns
Q _{rr}	Reverse Recovery Time			613		nC
I _{rrm}	Peak Reverse Recovery Current				104	

Thermal Characteristics

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
R _{θJC}	Thermal Resistance, Junction-to-Case	T _c =90°C, P _D =150W			0.13	°C/W

NTC-Thermistor

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
R ₂₅	Rated resistance	T _c =25°C		5.00		kΩ
ΔR/R	Deviation of R100	T _c = 100°C, R ₁₀₀ = 477Ω	-5		5	%
B25/50	B-value	R ₂ = R ₂₅ exp [B _{25/50} (1/T ₂ - 1/(298,15 K))]		3380		k
B25/80	B-value	R ₂ = R ₂₅ exp [B _{25/80} (1/T ₂ - 1/(298,15 K))]		3468		k
B25/100	B-value	R ₂ = R ₂₅ exp [B _{25/100} (1/T ₂ - 1/(298,15 K))]		3523		k

Typical Performance

Figure 1. Output Characteristics for Various T_J

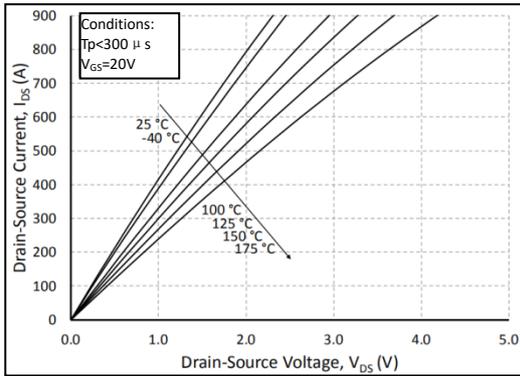


Figure 2. Normalized On-Resistance vs. Temperature

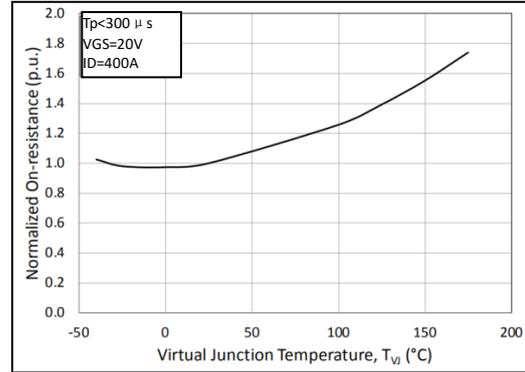


Figure 3. Threshold Voltage vs. Temperature

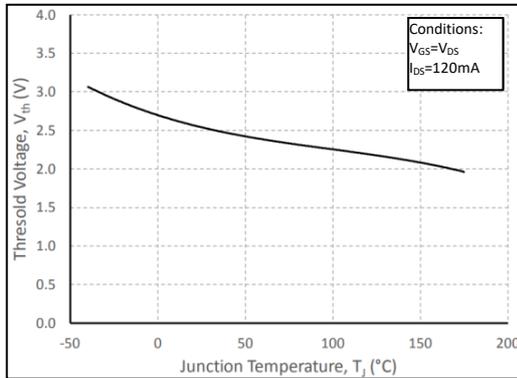


Figure 4. Transfer Characteristic for Various T_J

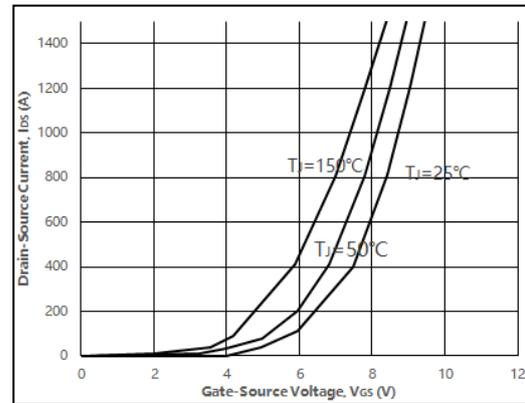


Figure 5. Diode Characteristic at 25 °C

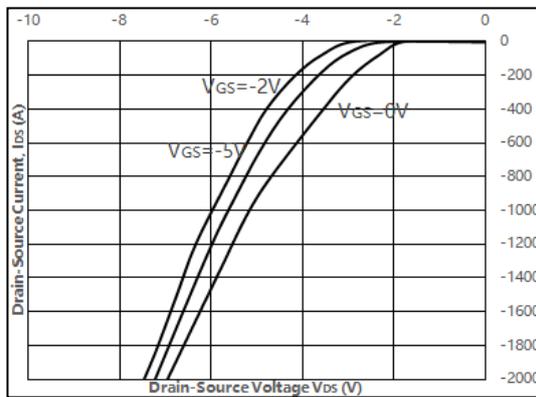


Figure 6. Typical Gate Charge Characteristics

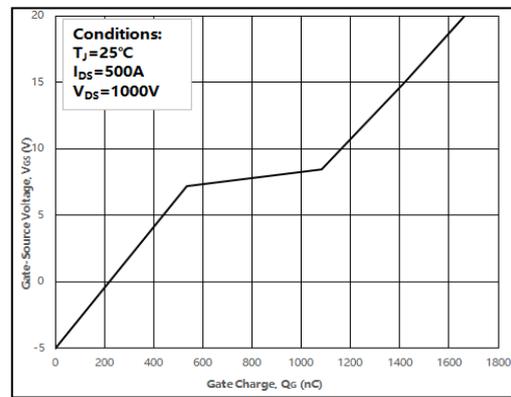


Figure 7. Typical Capacitances vs. Drain-Source Voltage

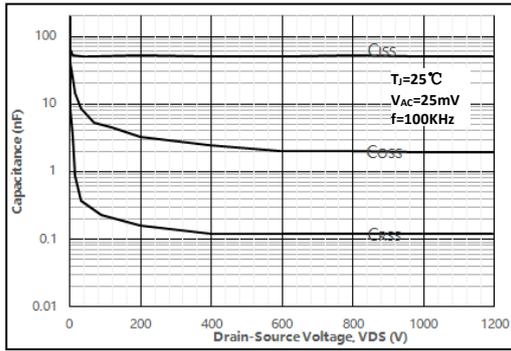


Figure 8. Inductive Switching Energy vs. Drain Current

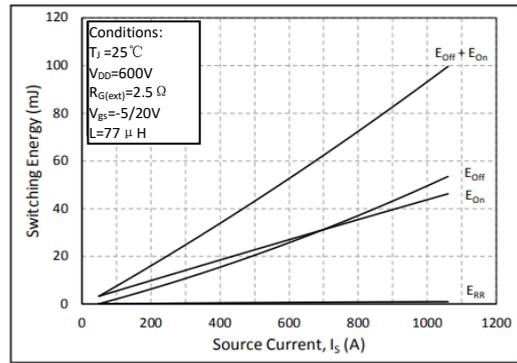


Figure 9. Resistive Switching Time Description

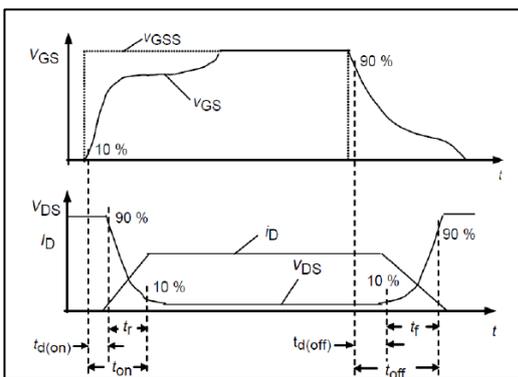
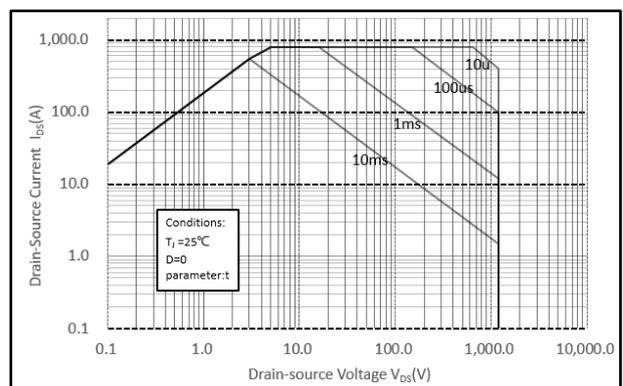


Figure 10. Safe Operating Area



Package Drawing:

