AT20130AG

200V N-Channel MOSFET

Features

- Advanced Shield Gate Trench technology
- Super Low Gate Charge
- High-Speed Switching
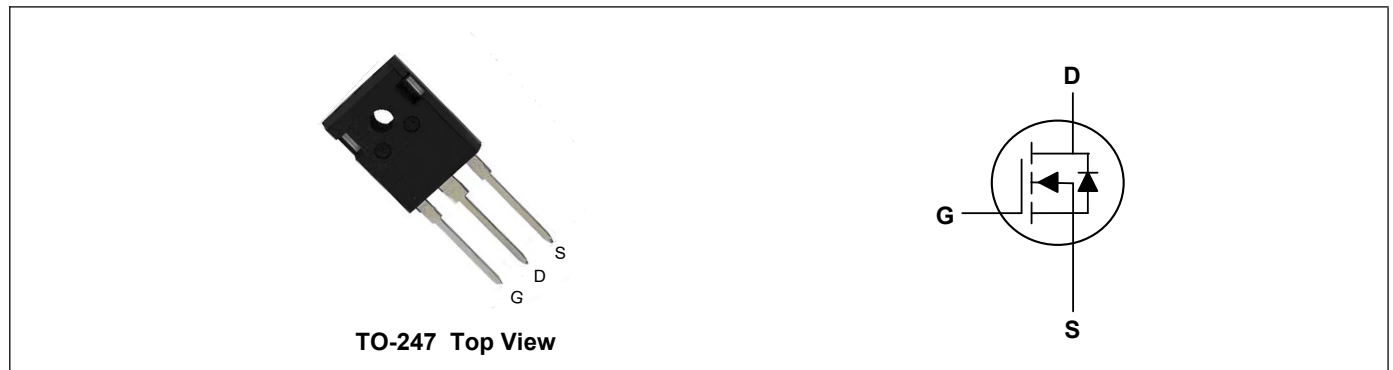- 100% EAS Guaranteed
- Green Device Available

Applications

- High Frequency Point-of-Load,Synchronous Buck Converter
- Networking DC-DC Power System
- Load Switch

Product Summary

RoHS

V_{DS}	200	V
I_D	130	A
$R_{DS(ON)}$ (at V_{GS}=10V)	10.5	mΩ

TO-247 Top View

Absolute Maximum Ratings(T$_C$=25℃, unless otherwise noted)

Parameter	Symbol	Rating	Units
Drain-Source Voltage	V_{DS}	200	V
Gate-Source Voltage	V_{GS}	±20	V
Continuous Drain Current[1]	I_D@T$_C$=25℃	130	A
Continuous Drain Current[1]	I_D@T$_C$=100℃	93	A
Pulsed Drain Current[2]	I_{DM}	370	A
Single Pulse Avalanche Energy[3]	E_{AS}	720	mJ
Total Power Dissipation	P_D	429	W
Storage Temperature Range	T_{STG}	-55 to 175	℃
Operating Junction Temperature Range	T_J	-55 to 175	℃

Thermal Characteristics

Parameter	Symbol	Typ	Max	Unit
Thermal Resistance Junction-Ambient[1]	$R_{\theta JA}$	---	60	℃/W
Thermal Resistance Junction-Case[1]	$R_{\theta JC}$	---	0.35	℃/W

Electrical Characteristics (T_J=25℃, unless otherwise noted)

Parameter	Symbol	Conditions	Min	Typ	Max	Unit
Drain-Source Breakdown Voltage	BV_{DSS}	V_{GS}=0V , I_D=250uA	200	---	---	V
Static Drain-Source On-Resistance	$R_{DS(ON)}$	V_{GS}=10V , I_D=20A	---	9	10.5	mΩ
Gate Threshold Voltage	$V_{GS(th)}$	V_{GS}=V_{DS} , I_D =250uA	2.0	---	4.0	V
Drain-Source Leakage Current	I_{DSS}	V_{DS}=160V, V_{GS}=0V	---	---	1	uA
Gate-Source Leakage Current	I_{GSS}	V_{GS}=±20V , V_{DS}=0V	---	---	±100	nA
Forward Transconductance	gfs	V_{DS}=5V , I_D=20A	---	70	---	S
Gate Resistance	R_g	V_{DS}=0V , V_{GS}=0V , f=1MHz	---	4	---	Ω
Total Gate Charge	Q_g	V_{DD}=100V , V_{GS}=10V , I_D=20A	---	55	---	nC
Gate-Source Charge	Q_{gs}		---	17	---	
Gate-Drain Charge	Q_{gd}		---	5	---	
Turn-On Delay Time	$T_{d(on)}$	V_{DS}=100V , V_{GS}=10V , R_G=10Ω, I_D=20A	---	16	---	ns
Rise Time	T_r		---	20	---	
Turn-Off Delay Time	$T_{d(off)}$		---	38	---	
Fall Time	T_f		---	10	---	
Input Capacitance	C_{iss}	V_{DS}=100V , V_{GS}=0V , f=1MHz	---	4980	---	pF
Output Capacitance	C_{oss}		---	420	---	
Reverse Transfer Capacitance	C_{rss}		---	8	---	

Drain-Source Diode Characteristics

Parameter	Symbol	Conditions	Min	Typ	Max	Unit
Diode Forward Voltage[2]	V_{SD}	V_{GS}=0V , I_S=20A , T_J=25℃	---	---	1.3	V
Reverse Recovery Time	t_{rr}	I_F=20A	---	140	---	nS
Reverse Recovery Charge	Q_{rr}	di/dt=100A/μs，T_J=25℃	---	630	---	nC

Note:

1.The data tested by surface mounted on a 1 inch[2] FR-4 board with 2OZ copper.

2.The data tested by pulsed , pulse width ≦ 300us , duty cycle ≦ 2%

3.The EAS data shows Max. rating . The test condition is V_{DD}=100V,L=0.4mH

Typical Characteristics
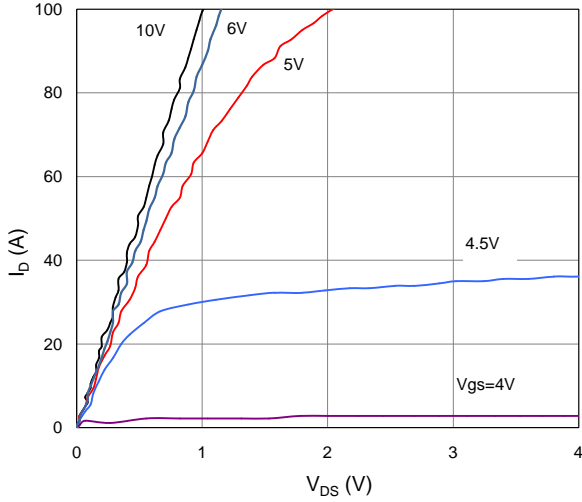
Fig 1. Typical Output Characteristics

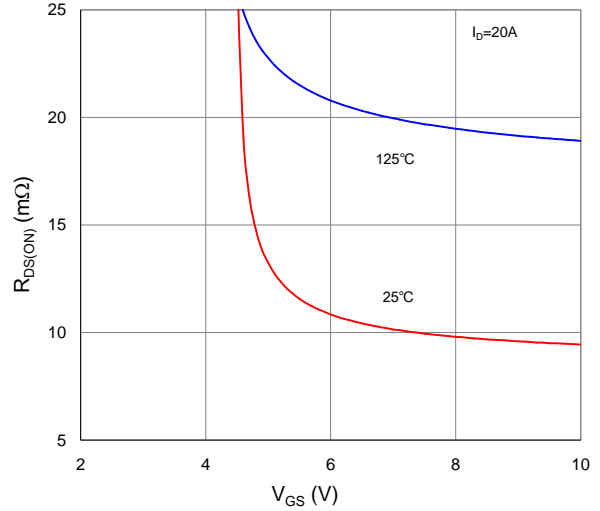Figure 2. On-Resistance vs. Gate-Source Voltage

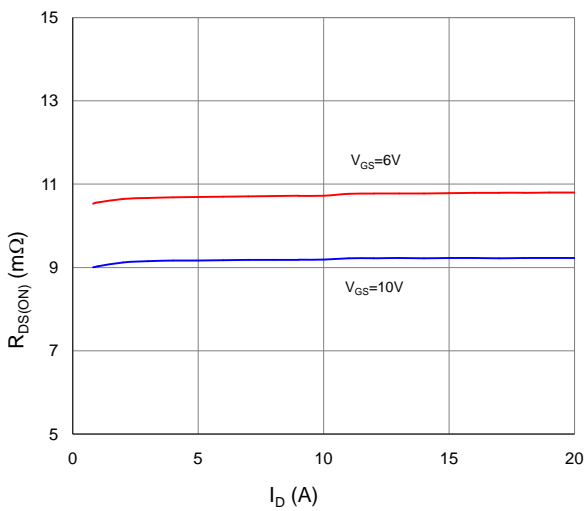Figure 3. On-Resistance vs. Drain Current and Gate Voltage

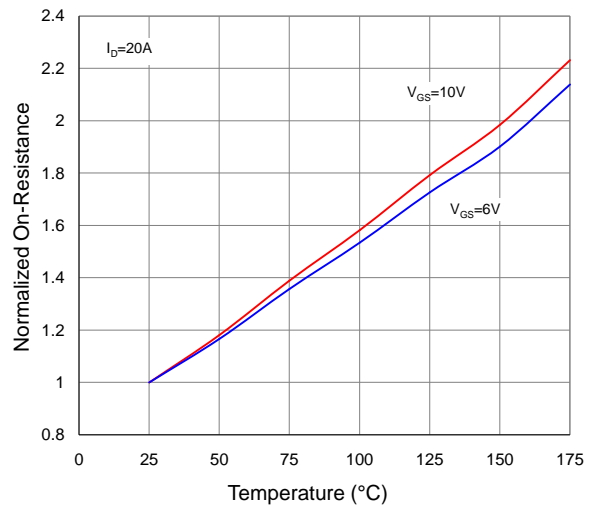Figure 4. Normalized On-Resistance vs. Junction Temperature
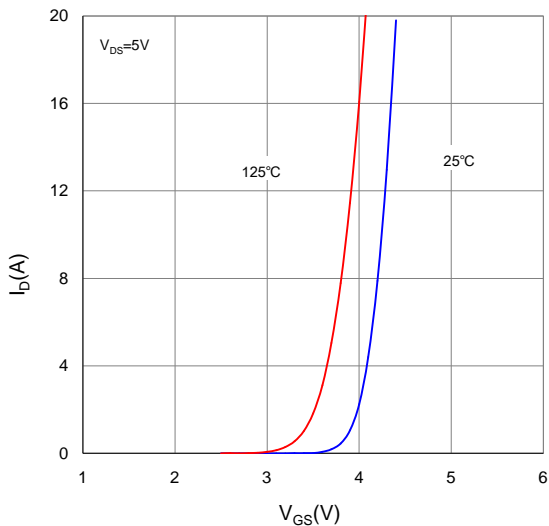

Figure 5. Typical Transfer Characteristics

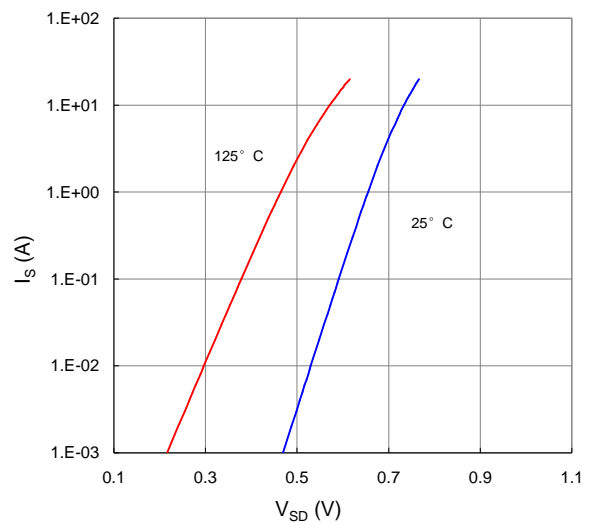
Figure 6. Typical Source-Drain Diode Forward Voltage

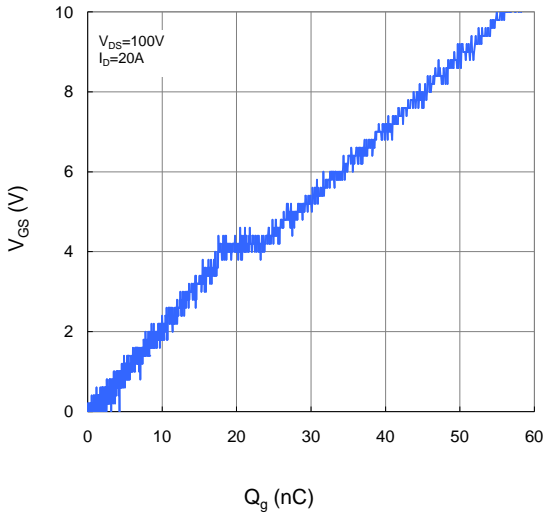Figure 7. Typical Gate-Charge vs. Gate-to-Source Voltage

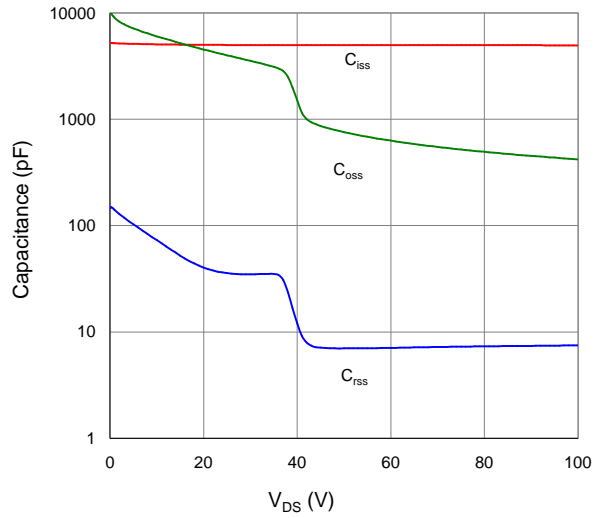Figure 8. Typical Capacitance vs. Drain-to-Source Voltage
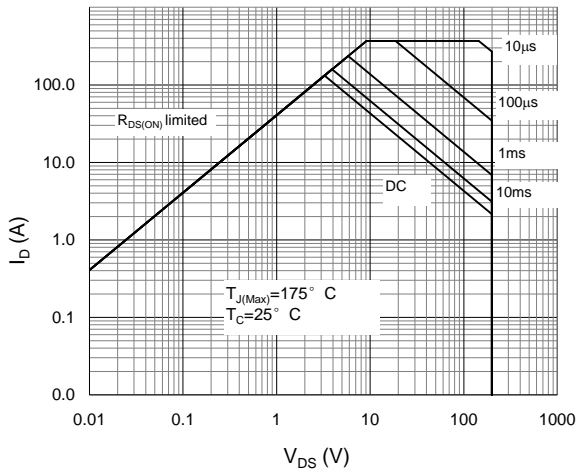

Figure 9. Maximum Safe Operating Area

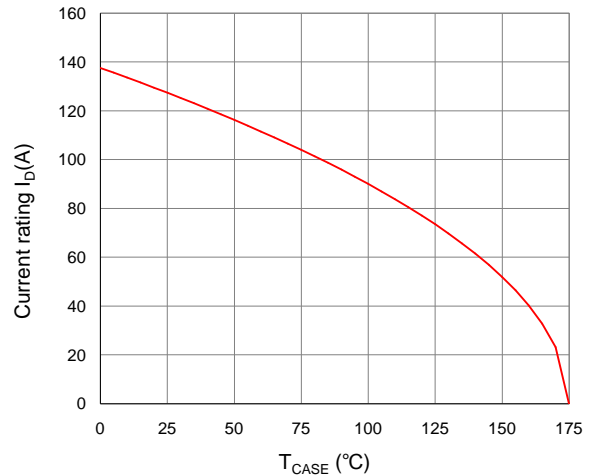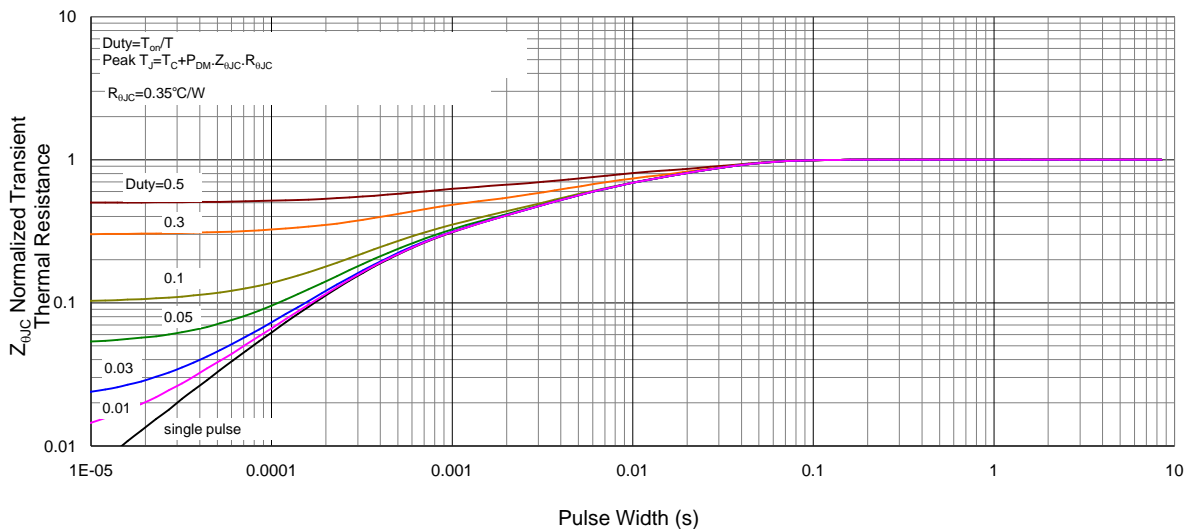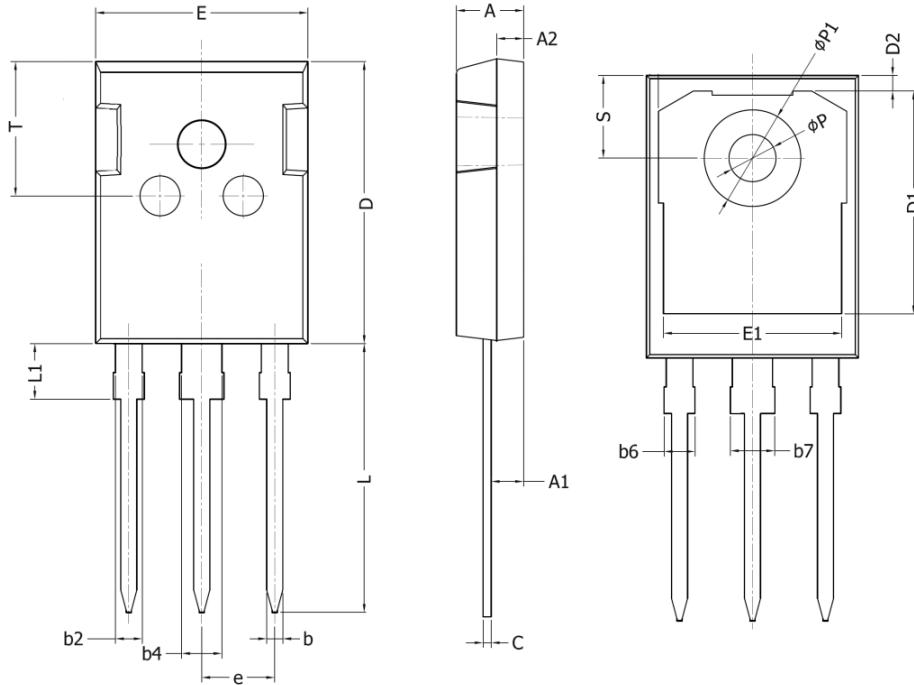Figure 10. Maximun Drain Current vs. Case Temperature

Figure 11. Normalized Maximum Transient Thermal Impedance, Junction-to-Case

TO-247 Package Outline Dimensions

Symbol	Dimensions In Millimeters	
	Min.	**Max.**
A	4.90	5.20
A1	2.31	2.51
A2	1.9	2.1
b	1.16	1.26
b2	1.96	2.06
b4	2.96	3.06
b6	-	2.25
b7	-	3.25
C	0.59	0.66
D	20.90	21.20
D1	16.25	16.85
D2	1.05	1.35
E	15.75	16.10
E1	13.00	13.60
e	5.436 BSC	
L	19.80	20.20
L1	-	4.30
P	3.40	3.60
P1	7.00	7.40
S	6.05	6.25
T	9.80	10.20