AT140N15L

150V N-Channel MOSFET

Features

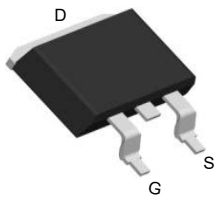
- Advanced Shield Gate Trench technology
- Super Low Gate Charge
- High-Speed Switching
- 100% EAS Guaranteed
- Green Device Available

Product Summary

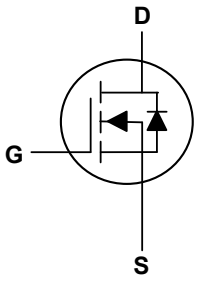
V_{DS}	150	V
I_D	140	A
$R_{DS(ON)}$(at V_{GS}=10V)	6.8	mΩ

Applications

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



TO-263 Top View



Absolute Maximum Ratings(T_C=25℃, unless otherwise noted)

Parameter	Symbol	Rating	Units
Drain-Source Voltage	V_{DS}	150	V
Gate-Source Voltage	V_{GS}	±20	V
Continuous Drain Current	I_D	140	A
Continuous Drain Current	I_D@T_C=100℃	100	A
Pulsed Drain Current	I_{DM}	560	A
Single Pulse Avalanche Energy[3]	EAS	1250	mJ
Total Power Dissipation	P_D	320	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-Case[1]	$R_{\theta JC}$	---	0.47	℃/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	150	---	---	V
Static Drain-Source On-Resistance	$R_{DS(ON)}$	V_{GS}=10V , I_D=70A	---	6.0	6.8	mΩ
Gate Threshold Voltage	$V_{GS(th)}$	V_{GS}=V_{DS} , I_D =250uA	2.0	3.0	4.0	V
Drain-Source Leakage Current	I_{DSS}	V_{DS}=150V , V_{GS}=0V , T_J=25℃	---	---	1	uA
Gate-Source Leakage Current	I_{GSS}	V_{GS}=±20V , V_{DS}=0V	---	---	±100	nA
Forward Transconductance	gfs	V_{DS}=10V , I_D=70A	70	---	---	S
Total Gate Charge	Q_g	V_{DS}=75V , V_{GS}=10V , I_D=70A	---	80	---	nC
Gate-Source Charge	Q_{gs}		---	32	---	
Gate-Drain Charge	Q_{gd}		---	13	---	
Turn-On Delay Time	$T_{d(on)}$	V_{DD}=75V ,I_D=70A, V_{GS}=10V , R_G=4.7Ω	---	26	---	ns
Rise Time	T_r		---	36	---	
Turn-Off Delay Time	$T_{d(off)}$		---	47	---	
Fall Time	T_f		---	15	---	
Input Capacitance	C_{iss}	V_{DS}=75V , V_{GS}=0V , f=1MHz	---	5750	---	pF
Output Capacitance	C_{oss}		---	660	---	
Reverse Transfer Capacitance	C_{rss}		---	7	---	

Drain-Source Diode Characteristics

Parameter	Symbol	Conditions	Min	Typ	Max	Unit
Continuous Source Current[2]	I_S		---	---	140	A
Diode Forward Voltage[1]	V_{SD}	V_{GS}=0V ,I_F=I_S , T_J=25℃	---	---	1.2	V
Reverse Recovery Time	t_{rr}	I_F=I_S ,di/dt=100A/μs, T_J=25℃	---	140	---	nS
Reverse Recovery Charge	Q_{rr}		---	498	---	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.ESD condition:T_j=25℃,V_{DD}=50V,V_{GS}=10V,L=0.5mH,R_g=25Ω

Typical Characteristics

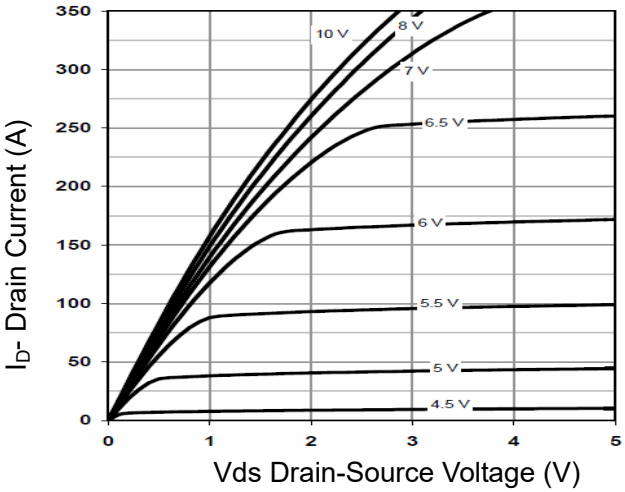


Figure 1 Output Characteristics

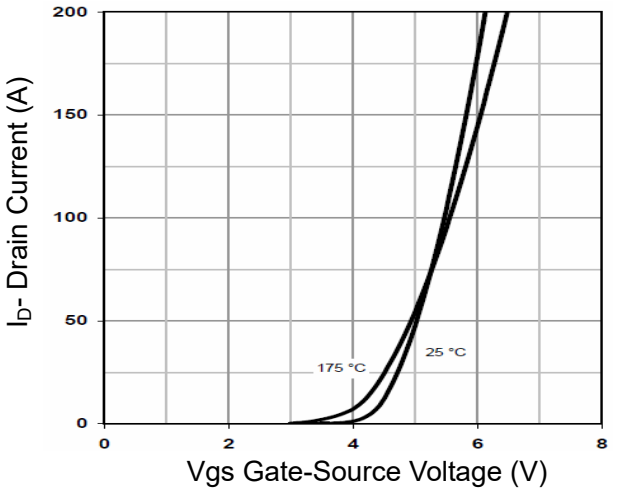


Figure 2 Transfer Characteristics

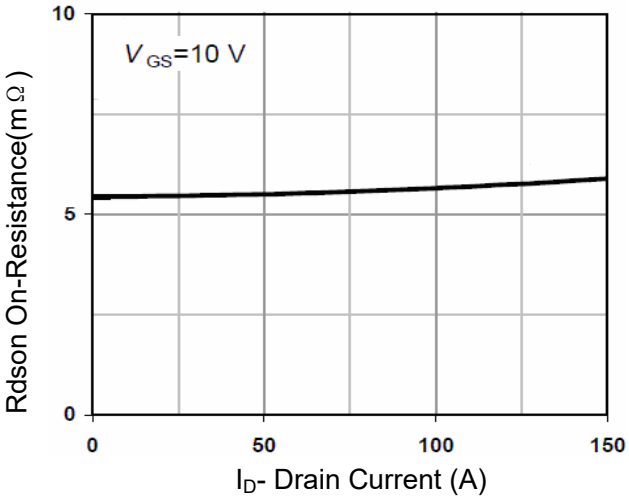


Figure 3 Rdson- Drain Current

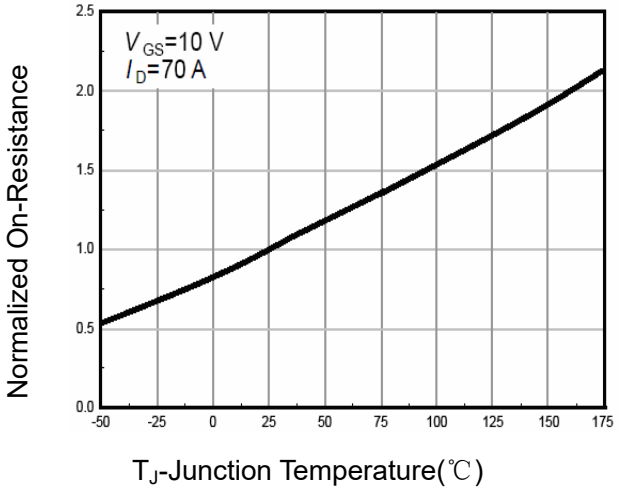


Figure 4 Rdson-JunctionTemperature

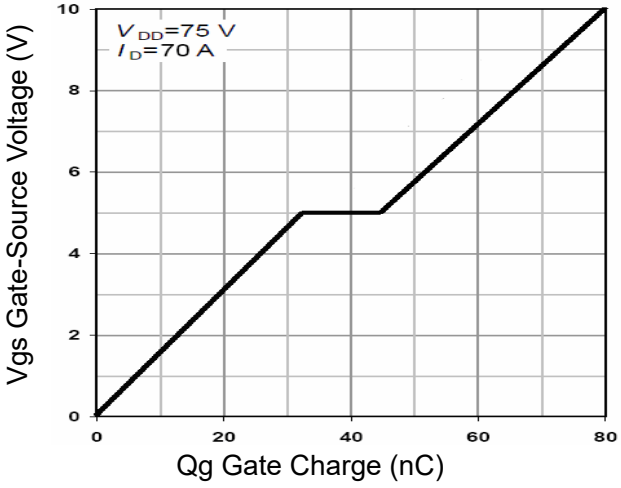


Figure 5 Gate Charge

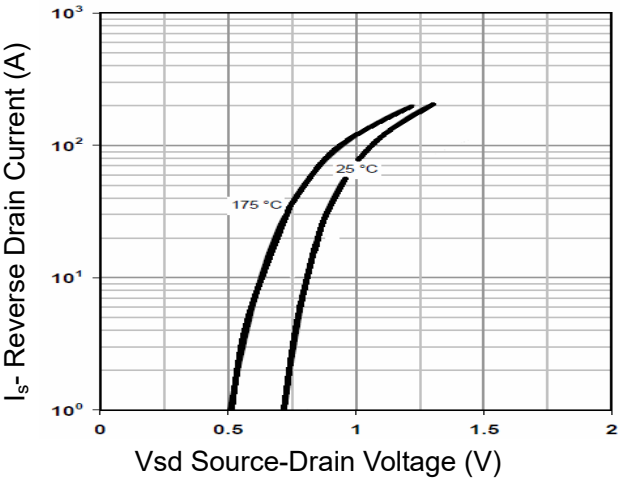


Figure 6 Source- Drain Diode Forward

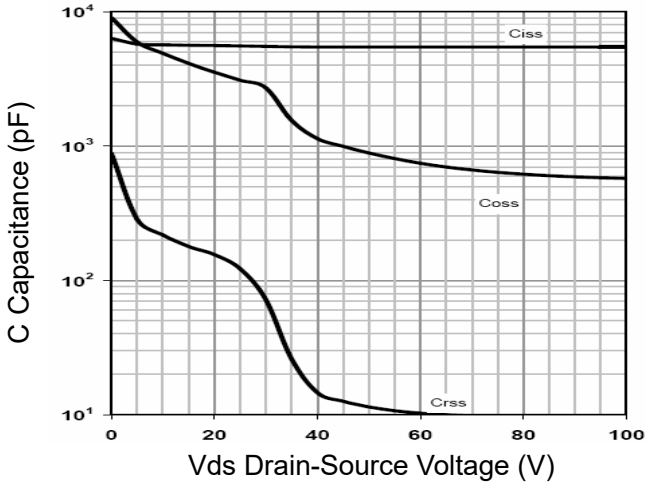


Figure 7 Capacitance vs Vds

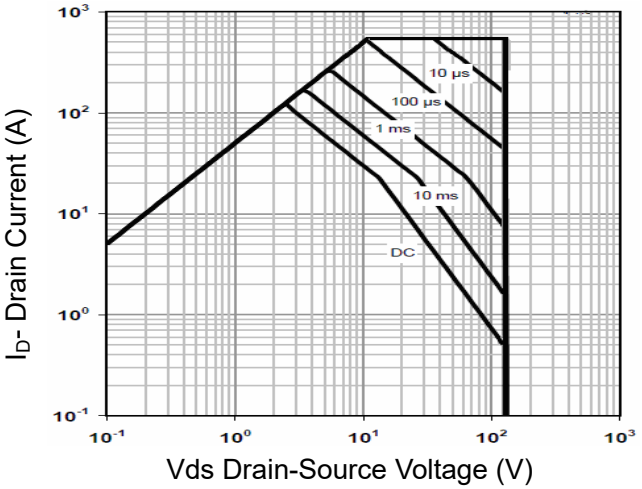


Figure 8 Safe Operation Area

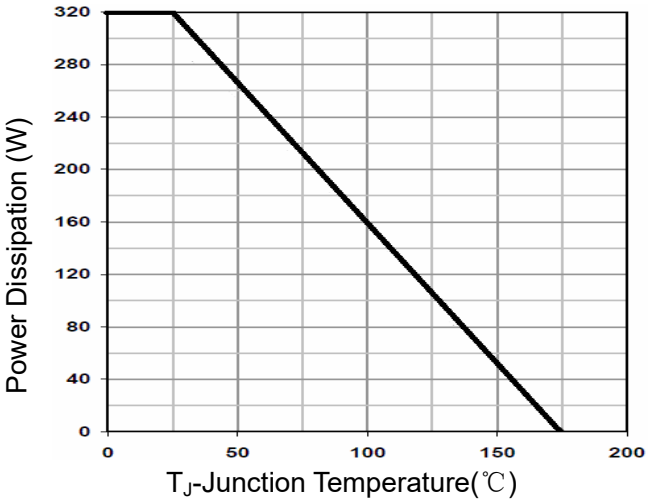


Figure 9 Power De-rating

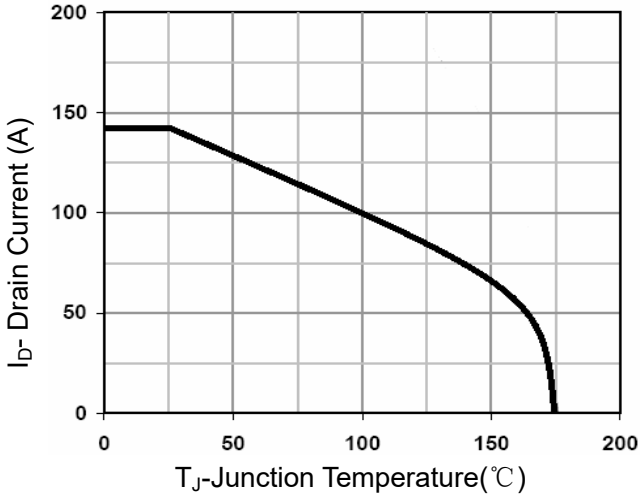


Figure 10 Current De-rating

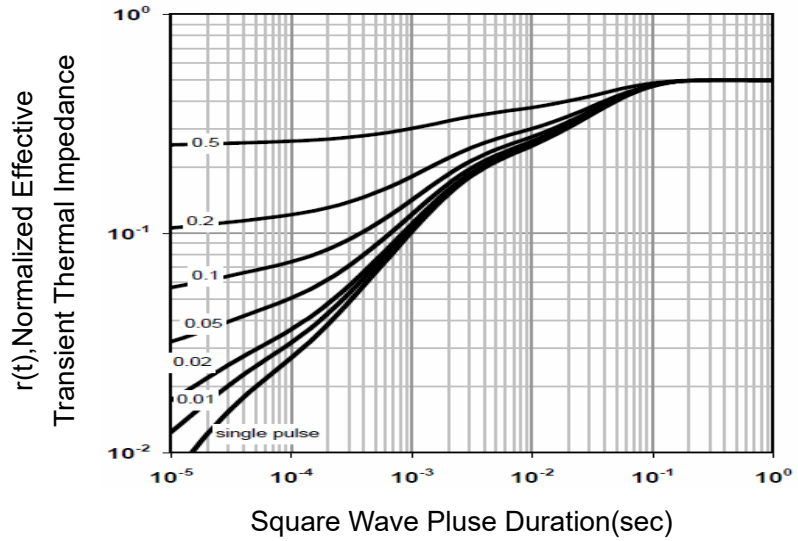
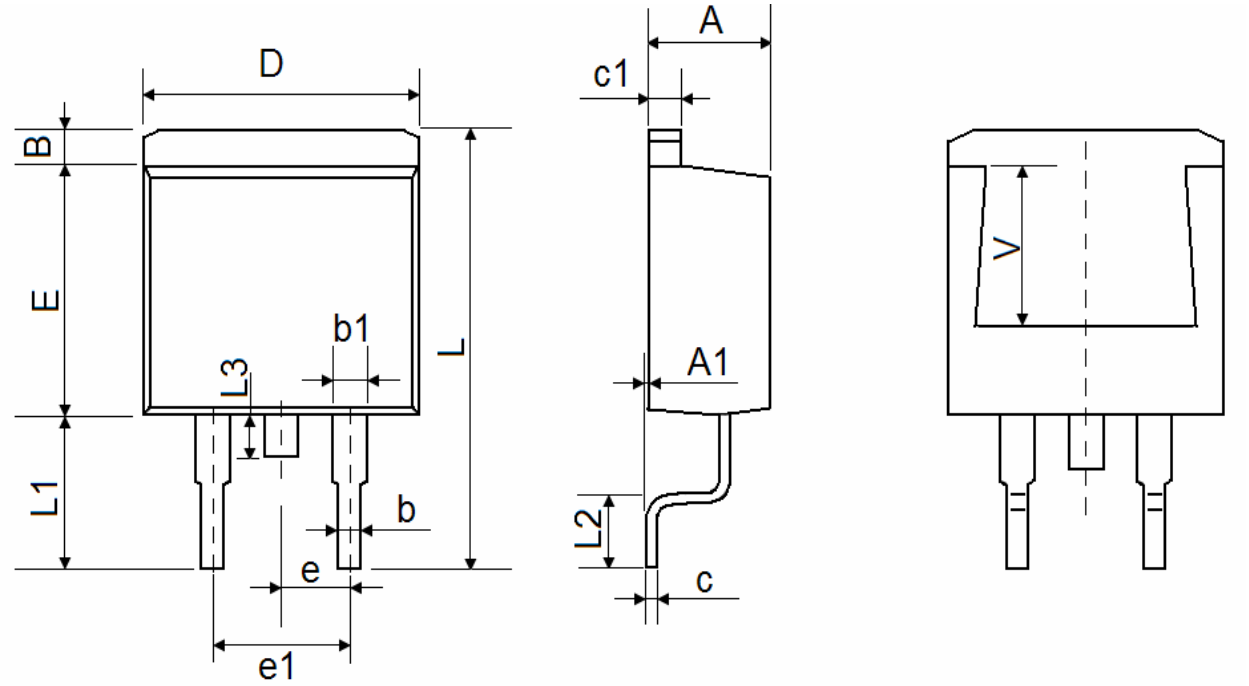


Figure 11 Normalized Maximum Transient Thermal Impedance

TO-263 Package Outline Dimensions



Symbol	Dimensions (unit:mm)			Symbol	Dimensions (unit:mm)		
	Min	Typ	Max		Min	Typ	Max
A	4.40	4.55	4.70	**A1**	0.00	0.07	0.15
B	1.00	1.20	1.40	**b**	0.65	0.80	0.95
b1	1.10	1.15	1.37	**c**	0.30	0.40	0.53
c1	1.10	1.25	1.37	**D**	9.80	10.00	10.40
E	8.50	8.80	9.20	**e**	2.54 REF		
e1	4.90	5.10	5.40	**L**	14.80	15.20	15.70
L1	5.00	5.25	5.60	**L2**	2.05	2.45	2.80
L3	1.20	1.50	1.80	**V**	5.60 REF		