

Product Summary

$V_{(BR)DSS}$	$R_{DS(on)MAX}$	I_D
650V	360mΩ@10V	11.5A

Feature

- New technology for high voltage device
- Low on-resistance and low conduction losses
- small package
- Ultra Low Gate Charge cause lower driving requirements
- Suffix "-Q1" for AEC-Q101

Application

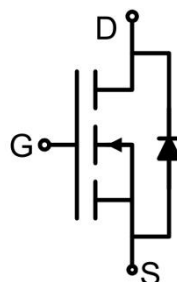
- Power factor correction (PFC)
- Switched mode power supplies(SMPS)
- Uninterruptible Power Supply (UPS)

Package

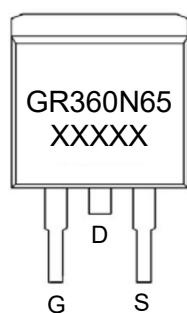


TO-263AB

Circuit diagram



Marking



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

Parameter	Symbol	Value	Unit
Drain-Source Voltage	V _{DS}	650	V
Gate-Source Voltage	V _{GS}	±30	V
Continuous Drain Current	I _D	11.5	A
Continuous Drain Current(T _C =100°C)	I _D (100°C)	7	A
Pulsed Drain Current ¹⁾	I _{DM}	46	A
Power Dissipation	P _D	101	W
Thermal Resistance,Junction-to-Case	R _{θJC}	1.24	°C/W
Single pulse avalanche energy ²⁾	E _{AS}	144	mJ
Junction Temperature	T _J	150	°C
Storage Temperature	T _{STG}	-55 ~ +150	°C

Electrical characteristics (T_A=25 °C unless otherwise noted)

Parameter	Symbol	Test Condition	Min.	Typ.	Max.	Unit
Static Characteristics						
Drain-source breakdown voltage	V _{(BR)DSS}	V _{GS} = 0V, I _D =250μA	650			V
Zero gate voltage drain current(T _C =25°C)	I _{DSS}	V _{DS} =650V, V _{GS} = 0V		0.05	1	μA
Gate-body leakage current	I _{GSS}	V _{GS} =±20V, V _{DS} = 0V			±100	nA
Gate threshold voltage	V _{GS(th)}	V _{DS} =V _{GS} , I _D =250μA	3.0	3.5	4.0	V
Drain-source on-resistance	R _{DS(on)}	V _{GS} =10V, I _D =7A		290	360	mΩ
Dynamic characteristics ³⁾						
Input Capacitance	C _{iss}	V _{DS} =50V, V _{GS} =0V, f =1.0MHz		870		pF
Output Capacitance	C _{oss}			54		
Reverse Transfer Capacitance	C _{rss}			1.8		
Total Gate Charge	Q _g	V _{DS} =480V, V _{GS} =10V, I _D =11.5A		19		nC
Gate-Source Charge	Q _{gs}			6		
Gate-Drain Charge	Q _{gd}			6.5		
Turn-on delay time	t _{d(on)}	V _{DD} =380V, V _{GS} =10V, I _D =5.5A, R _G =3Ω		11		nS
Turn-on rise time	t _r			8		
Turn-off delay time	t _{d(off)}			58		
Turn-off fall time	t _f			9		
Source-Drain Diode characteristics						
Diode Forward Current	I _S	T _C =25°C			11.5	A
Diode Forward voltage	V _{SD}	V _{GS} =0V, I _{SD} =11.5A, T _J =25°C		0.9	1.2	V
Reverse Recovery Time	t _{rr}	T _J = 25°C, I _F =5.8A di/dt = 100A/μs		220		nS
Reverse Recovery Charge	Q _{rr}			2.2		nC
Peak Reverse Recovery Current	I _{rrm}			19		A

Notes:

1) Repetitive Rating: Pulse width limited by maximum junction temperature

2) T_J=25°C, V_{DD}=50V, V_G=10V, R_G=25Ω

3) Guaranteed by design, not subject to production

Typical Characteristics

Figure1. Safe operating area

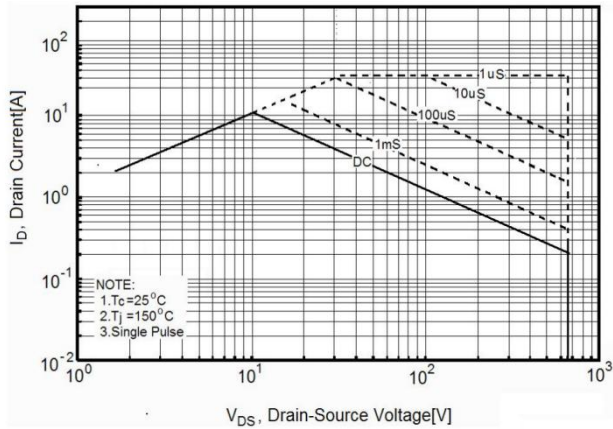


Figure2. Source-Drain Diode Forward Voltage

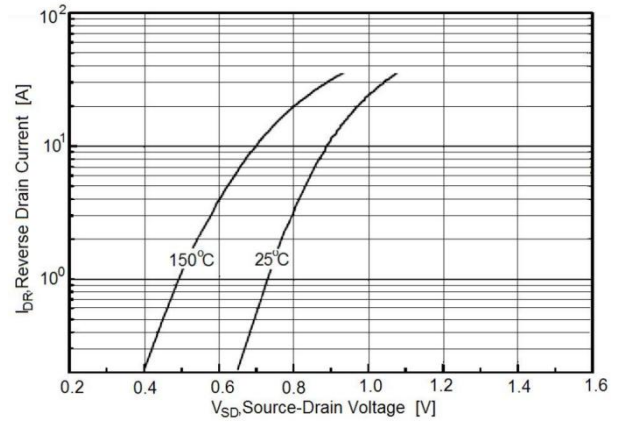


Figure3. Output characteristics

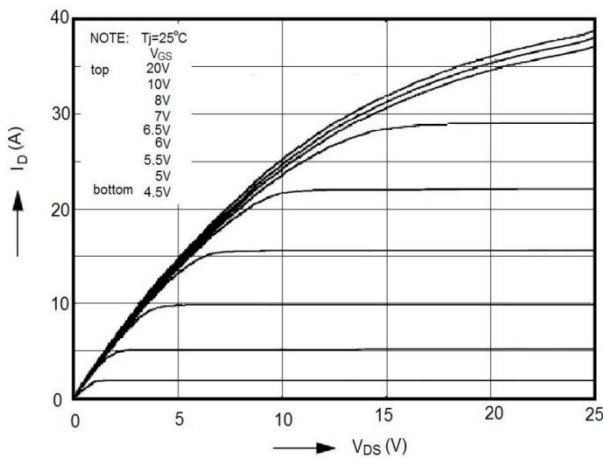


Figure4. Transfer characteristics

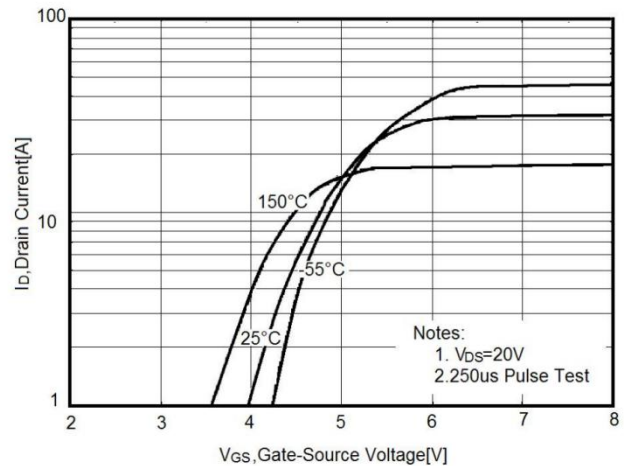


Figure5. Static drain-source on resistance

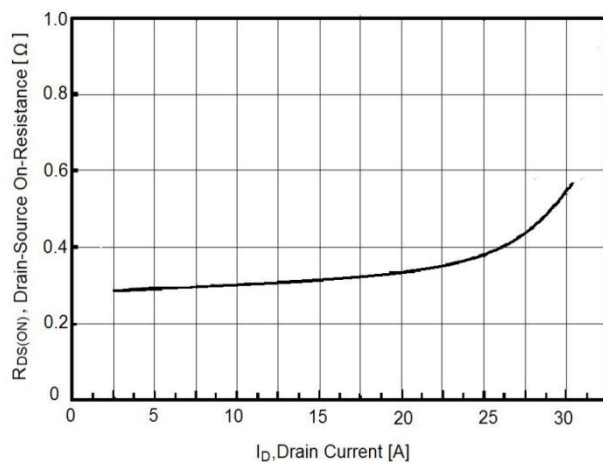
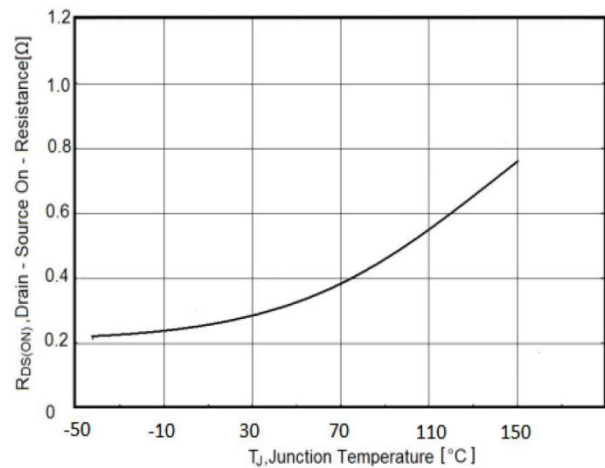


Figure6. $R_{DS(ON)}$ vs Junction Temperature



Typical Characteristics

Figure7. BV_{DSS} vs Junction Temperature

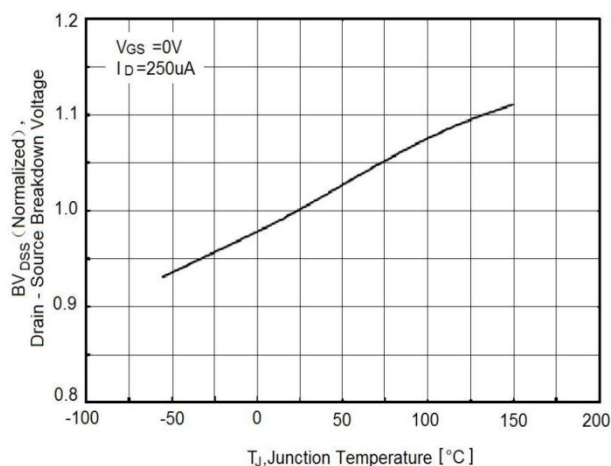


Figure8. Maximum I_D vs Junction Temperature

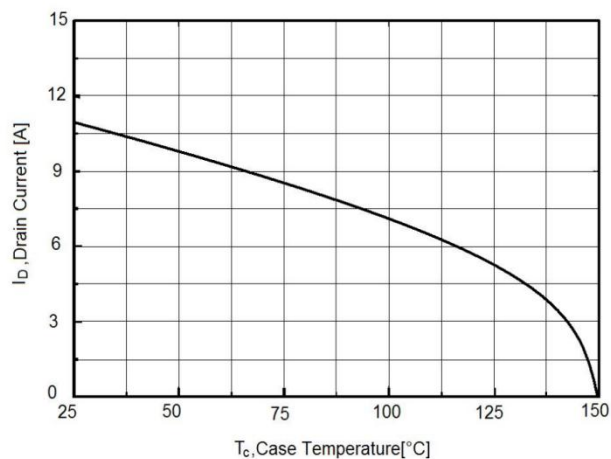


Figure9. Gate charge waveforms

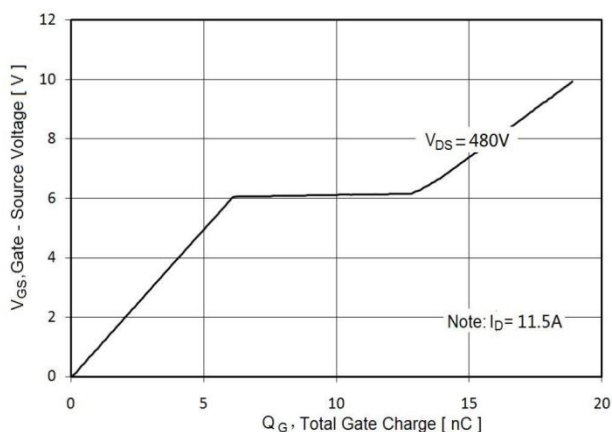


Figure10. Capacitance

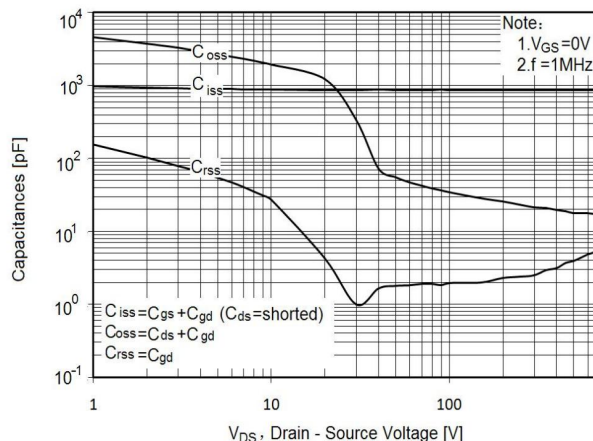


Figure10. Capacitance

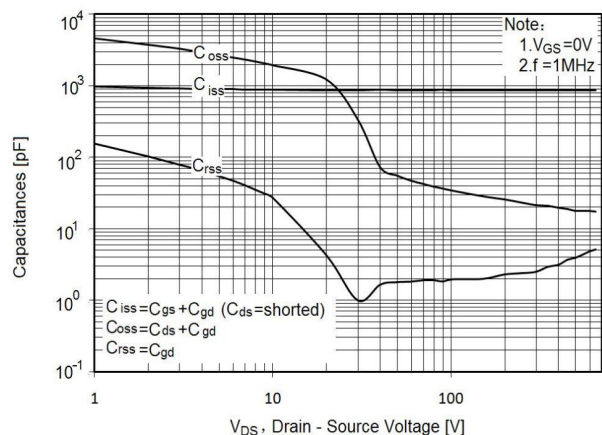
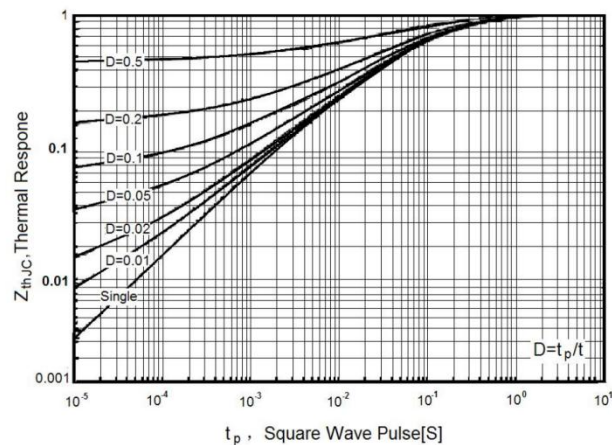
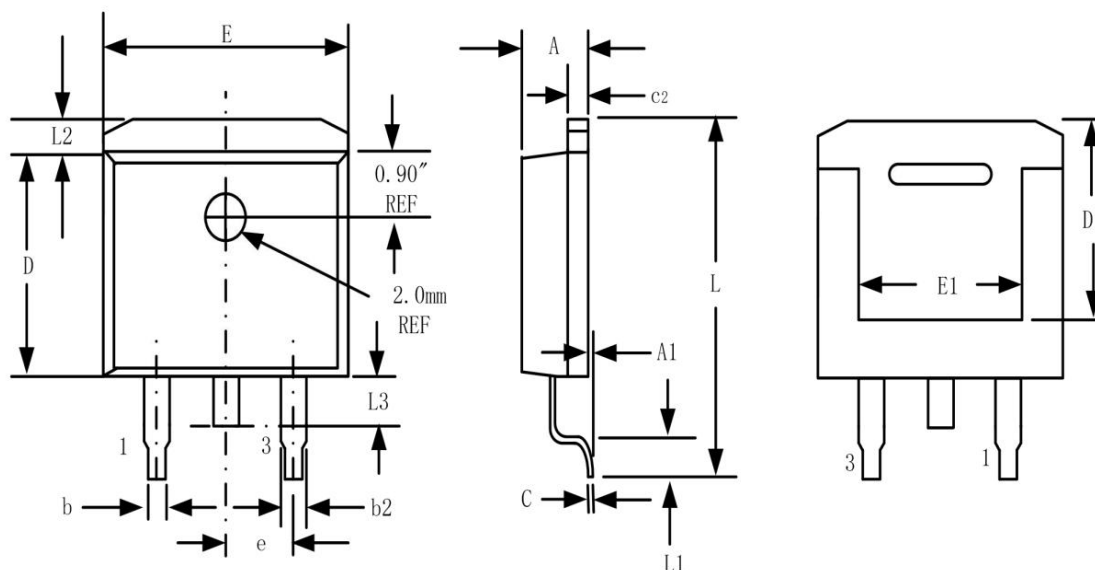


Figure11. Transient Thermal Impedance



TO-263AB Package Information



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	4.320	4.570	0.170	0.180
A1	-	0.250	-	0.010
b	0.710	0.940	0.028	0.037
b2	1.150	1.400	0.045	0.055
c	0.460	0.610	0.018	0.024
c2	1.220	1.400	0.048	0.055
D	8.890	9.400	0.350	0.370
D1	8.010	8.230	0.315	0.324
E	10.040	10.280	0.395	0.405
E1	7.880	8.080	0.310	0.318
e	2.540 BSC		0.100 BSC	
L	14.730	15.750	0.580	0.620
L1	2.290	2.790	0.090	0.110
L2	1.150	1.390	0.045	0.055
L3	1.270	1.770	0.050	0.070