

Product Summary

$V_{(BR)DSS}$	$R_{DS(on)MAX}$	I_D
650V	149mΩ@10V	28A

Feature

- Optimized body diode reverse recovery performance
- Low on-resistance and low conduction losses
- Small package
- Ultra low gate charge cause lower driving requirements

Application

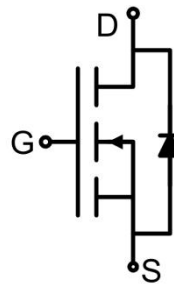
- Power factor correction (PFC)
- Switched mode power supplies(SMPS)
- Uninterruptible power supply (UPS)
- LLC half-bridge

Package

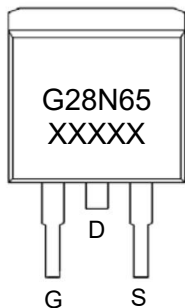


TO-263AB

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 AC(f > 1Hz)	V _{GS}	±40	V
Gate-Source Voltage	V _{GS}	±30	V
Continuous Drain Current	I _D	28	A
Continuous Drain Current(T _C =100°C)	I _D	18	A
Pulsed Drain Current	I _{DM}	112	A
Power Dissipation	P _D	260	W
Thermal Resistance,Junction-to-Case ¹⁾	R _{θJC}	0.48	°C/W
Thermal Resistance from Junction to Ambient	R _{θJA}	62	°C/W
Single Pulse Avalanche Energy ²⁾	E _{AS}	676	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	I _{DSS}	V _{DS} =650V, V _{GS} = 0V			3	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	2.6	3.5	4.3	V
Drain-Source on-Resistance	R _{DS(on)}	V _{GS} =10V, I _D =14A		120	149	mΩ
Dynamic Characteristics³⁾						
Input Capacitance	C _{iss}	V _{DS} =50V, V _{GS} =0V, f =1MHz		2070		pF
Output Capacitance	C _{oss}			120		
Total Gate Charge	Q _g	V _{DS} =480V, V _{GS} =10V, I _D =28A		37.5		nC
Gate-Source Charge	Q _{gs}			13		
Gate-Drain Charge	Q _{gd}			11.5		
Turn-on Delay Time	t _{d(on)}	V _{DD} =380V, V _{GS} =10V, I _D =14A, R _{GEN} =2.3Ω		14		nS
Turn-on Rise Time	t _r			12		
Turn-off Delay Time	t _{d(off)}			65		
Turn-off Fall Time	t _f			11		
Source-Drain Diode Characteristics						
Diode Forward Current	I _S	T _C =25°C			28	A
Diode Forward Pulse Current	I _{SDM}				112	A
Diode Forward voltage	V _{SD}	T _J =25°C, V _{GS} =0V, I _S =28A		0.9	1.2	V
Reverse Recovery Time	t _{rr}	T _J =25°C, I _F =14A, di/dt=100A/μs		190		nS
Reverse Recovery Charge	Q _{rr}				2	uC

Notes:

- 1) Repetitive Rating: Pulse width limited by maximum junction temperature.
- 2) EAS condition : T_J=25 °C, V_{DD}=50V, V_G=10V, L=0.5mH, R_G=25Ω.
- 3) Guaranteed by design, not subject to production.

Typical Characteristics

Figure1. Safe operating area

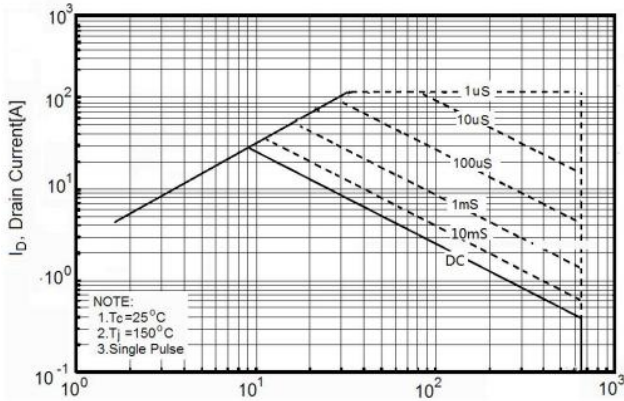


Figure2. Source-Drain Diode Forward Voltage

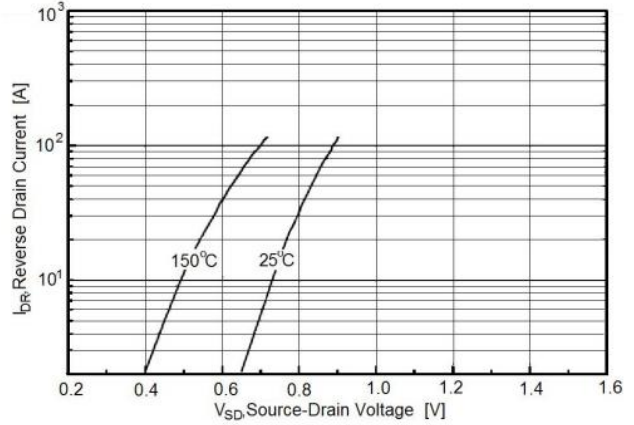


Figure3. Output characteristics

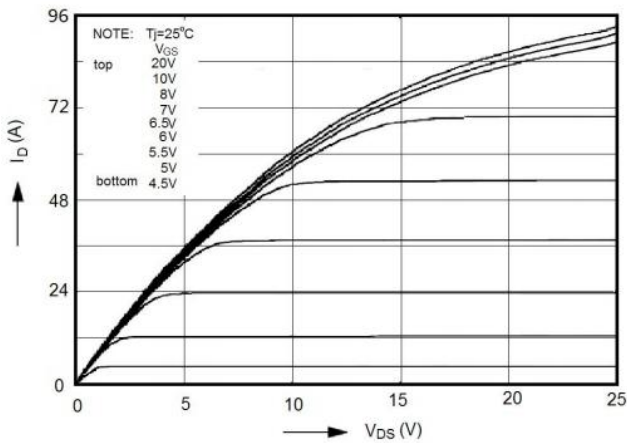


Figure4. Transfer characteristics

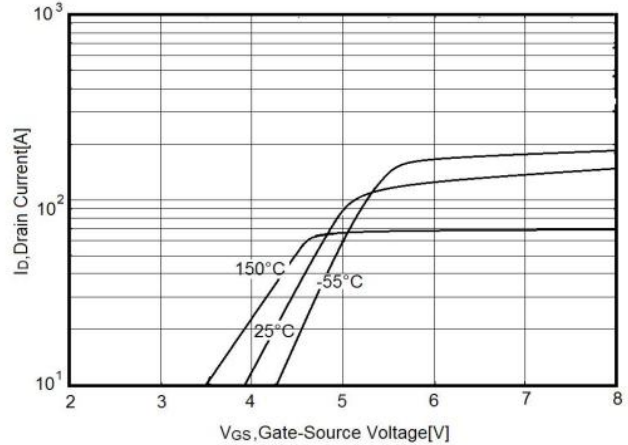


Figure5. Static drain-source on resistance

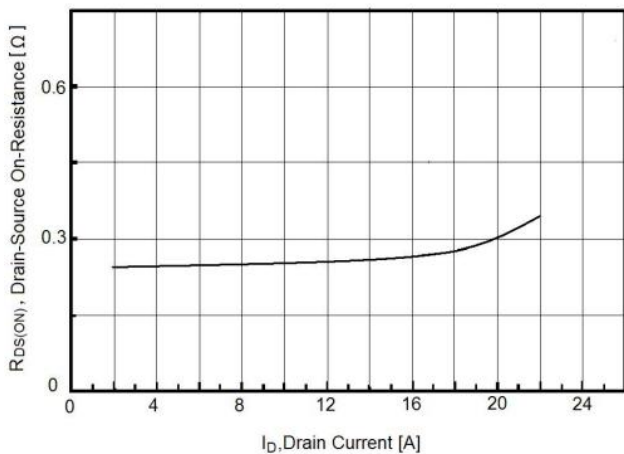
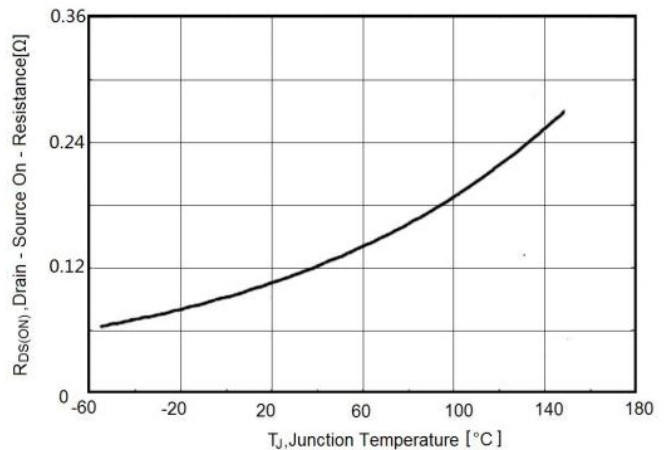


Figure6. $R_{DS(on)}$ vs Junction Temperature



Typical Characteristics

Figure7. BV_{DSS} vs Junction Temperature

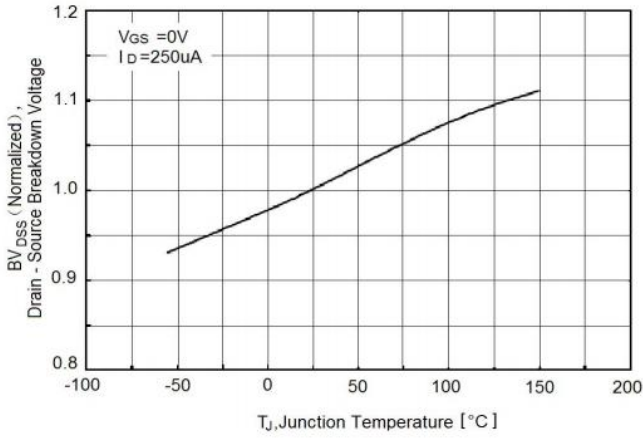


Figure8. Maximum I_D vs Junction Temperature

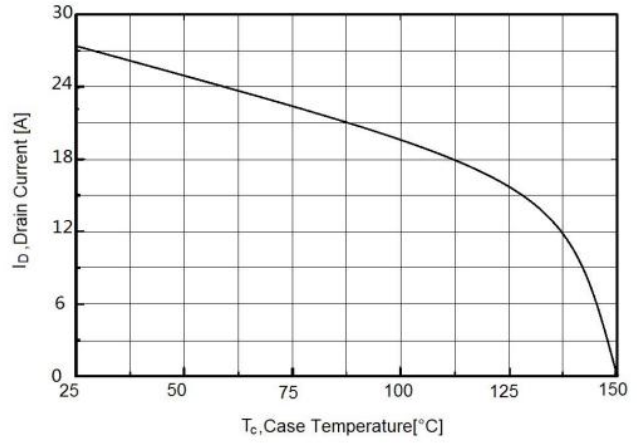


Figure9. Gate charge waveforms

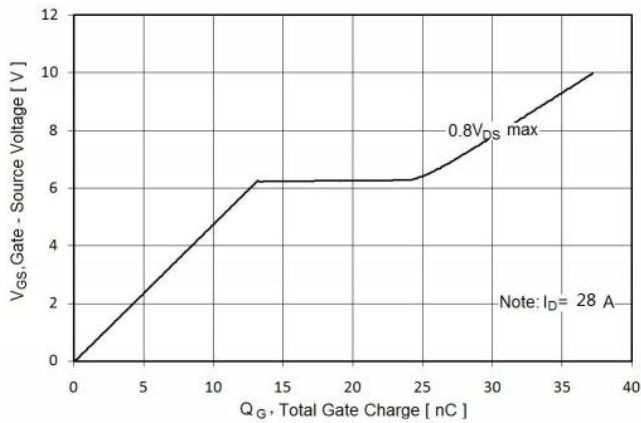


Figure10. Capacitance

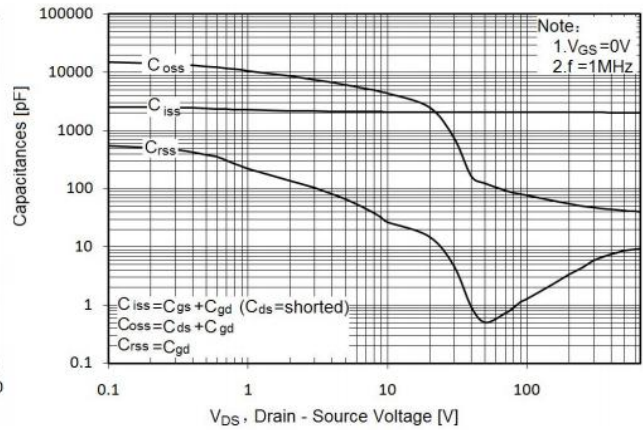
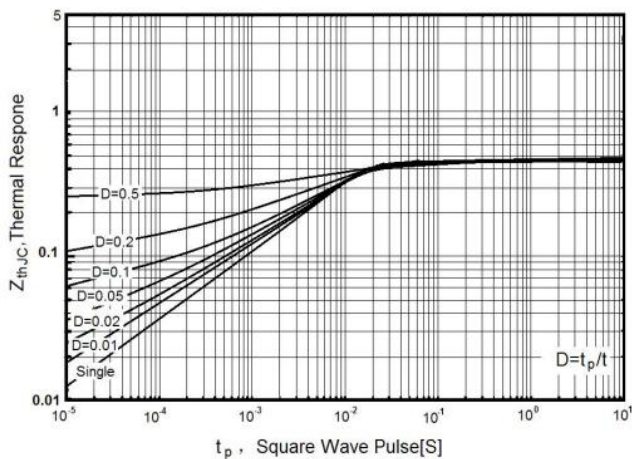
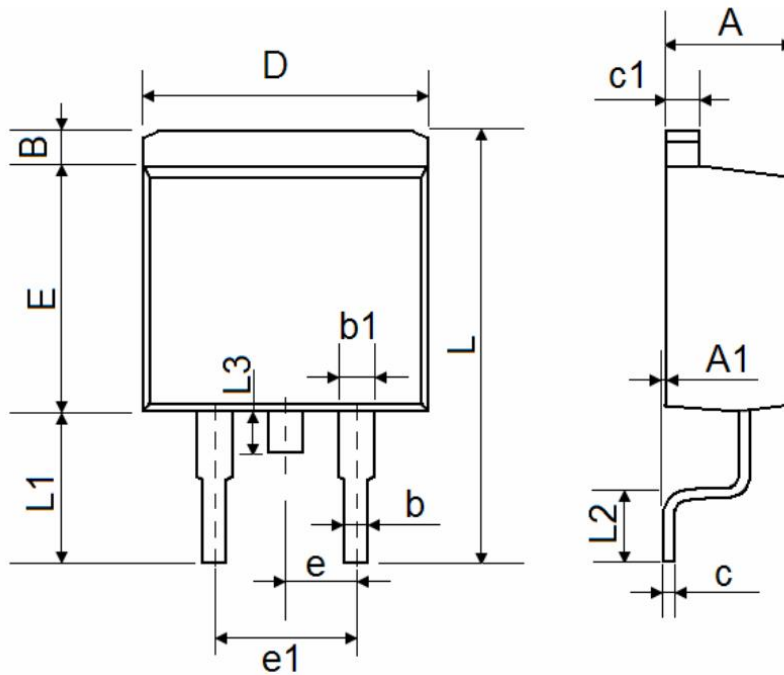


Figure11. Transient Thermal Impedance



TO-263AB Package Information



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	4.320	4.670	0.170	0.184
A1	0.000	0.250	0.000	0.010
B	1.150	1.390	0.045	0.055
b	0.710	0.910	0.028	0.036
b1	1.150	1.400	0.045	0.055
c	0.310	0.610	0.012	0.024
c1	1.170	1.400	0.046	0.055
D	10.010	10.310	0.394	0.406
E	8.500	9.400	0.335	0.370
e	2.540 TYP.		0.100 TYP.	
e1	4.980	5.180	0.196	0.204
L	14.610	15.880	0.575	0.625
L1	5.080	5.480	0.200	0.216
L2	1.780	2.790	0.070	0.110
L3	1.270	1.770	0.050	0.070