

### Product Summary

$V_{(BR)DSS}$	$R_{DS(on)MAX}$	$I_D$
650V	130mΩ@10V	26A

### Feature

- New technology for high voltage device
- Ultra low on-resistance and ultra low conduction losses
- Diode reverse recovery speed is super fast
- High reliability
- Ultra low gate charge cause lower driving requirements

### Application

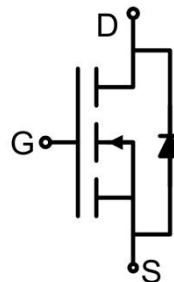
- Power factor correction (PFC)
- Switched mode power supplies(SMPS)
- Uninterruptible power supply (UPS)
- On-board charger (OBS)

### Package

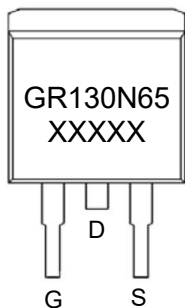


TO-263AB

### Circuit Diagram



### Marking



### Absolute Maximum Ratings (T<sub>C</sub>=25°C unless otherwise noted)

Parameter	Symbol	Value	Unit
Drain-Source Voltage	V <sub>DS</sub>	650	V
Gate-Source Voltage AC(f > 1Hz)	V <sub>GS</sub>	±30	V
Gate-Source Voltage	V <sub>GS</sub>	±20	V
Continuous Drain Current	I <sub>D</sub>	26	A
Continuous Drain Current(T <sub>C</sub> =100°C)	I <sub>D</sub> (100°C)	18.2	A
Pulsed Drain Current <sup>1)</sup>	I <sub>DM</sub>	78	A
Power Dissipation	P <sub>D</sub>	237	W
Thermal Resistance,Junction-to-Case	R <sub>θJC</sub>	0.63	°C/W
Thermal Resistance from Junction to Ambient	R <sub>θJA</sub>	62	°C/W
Avalanche Current <sup>2)</sup>	I <sub>AS</sub>	7	A
Junction Temperature	T <sub>J</sub>	175	°C
Storage Temperature	T <sub>STG</sub>	-55 ~ +175	°C

### Electrical Characteristics (T<sub>A</sub>=25 °C unless otherwise noted)

Parameter	Symbol	Test Condition	Min.	Typ.	Max.	Unit
<b>Static Characteristics</b>						
Drain-Source Breakdown Voltage	V <sub>(BR)DSS</sub>	V <sub>GS</sub> = 0V, I <sub>D</sub> =250μA	650			V
Zero Gate Voltage Drain Current	I <sub>DSS</sub>	V <sub>DS</sub> =650V, V <sub>GS</sub> = 0V, T <sub>C</sub> =25°C			10	μA
		V <sub>DS</sub> =650V, V <sub>GS</sub> = 0V, T <sub>C</sub> =125°C			400	
Gate-Body Leakage Current	I <sub>GSS</sub>	V <sub>GS</sub> =±20V, V <sub>DS</sub> = 0V			±100	nA
Gate Threshold Voltage	V <sub>GS(th)</sub>	V <sub>DS</sub> =V <sub>GS</sub> , I <sub>D</sub> =500μA	3.5	4.2	5.0	V
Drain-Source on-Resistance	R <sub>DS(on)</sub>	V <sub>GS</sub> =10V, I <sub>D</sub> =13A		110	130	mΩ
<b>Dynamic Characteristics<sup>3)</sup></b>						
Input Capacitance	C <sub>iss</sub>	V <sub>DS</sub> =50V, V <sub>GS</sub> =0V, f =1MHz		2161		pF
Output Capacitance	C <sub>oss</sub>			95		
Reverse Transfer Capacitance	C <sub>rss</sub>			50		
Gate Resistance	R <sub>g</sub>	f =1MHz, open drain		1.5		Ω
Total Gate Charge	Q <sub>g</sub>	V <sub>DS</sub> =480V, V <sub>GS</sub> =10V, I <sub>D</sub> =13A		41.2		nC
Gate-Source Charge	Q <sub>gs</sub>			16.3		
Gate-Drain Charge	Q <sub>gd</sub>			12.8		
Gate Plateau Volitage	V <sub>gp</sub>			7		
Turn-on Delay Time	t <sub>d(on)</sub>	V <sub>DD</sub> =380V, V <sub>GS</sub> =10V, I <sub>D</sub> =13A, R <sub>G</sub> =1.7Ω		43		nS
Turn-on Rise Time	t <sub>r</sub>			16		
Turn-off Delay Time	t <sub>d(off)</sub>			93		
Turn-off Fall Time	t <sub>f</sub>			20		
<b>Source-Drain Diode Characteristics</b>						
Diode Forward Current	I <sub>SD</sub>	T <sub>C</sub> =25°C			26	A
Diode Forward Pulse Current	I <sub>SDM</sub>				78	A
Diode Forward voltage	V <sub>SD</sub>	T <sub>J</sub> =25°C, V <sub>GS</sub> =0V, I <sub>SD</sub> =26A			1.2	V
Reverse Recovery Time	t <sub>rr</sub>	T <sub>J</sub> =25°C, I <sub>F</sub> =13A, di/dt=100A/μs		145		nS
Reverse Recovery Charge	Q <sub>rr</sub>			0.725		uC
Peak Reverse Recovery Current	I <sub>rrm</sub>			10		A

Notes:

- 1) Repetitive Rating: Pulse width limited by maximum junction temperature.
- 2) T<sub>J</sub>=25 °C, V<sub>DD</sub>=50V, V<sub>G</sub>=10V, R<sub>G</sub>=25Ω.
- 3) Guaranteed by design, not subject to production.

## Typical Characteristics

Figure1. Safe operating area

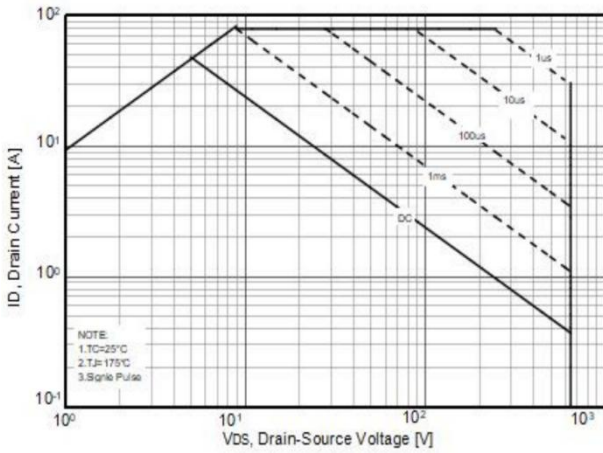


Figure2. Capacitance

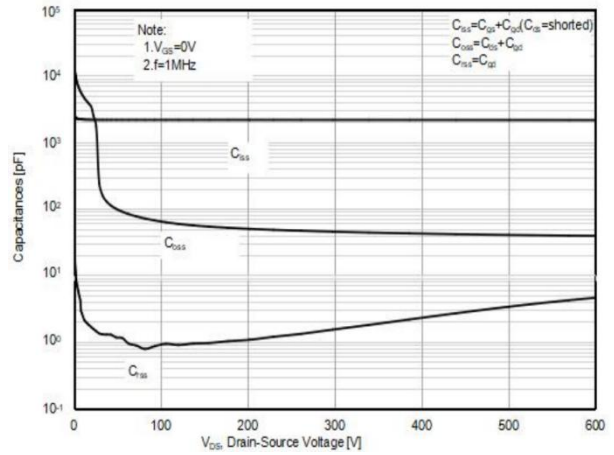


Figure3. Output characteristics

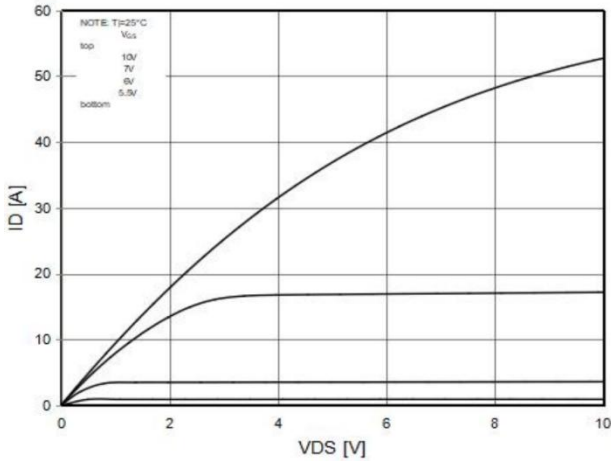


Figure4. Source-Drain Diode Forward Voltage

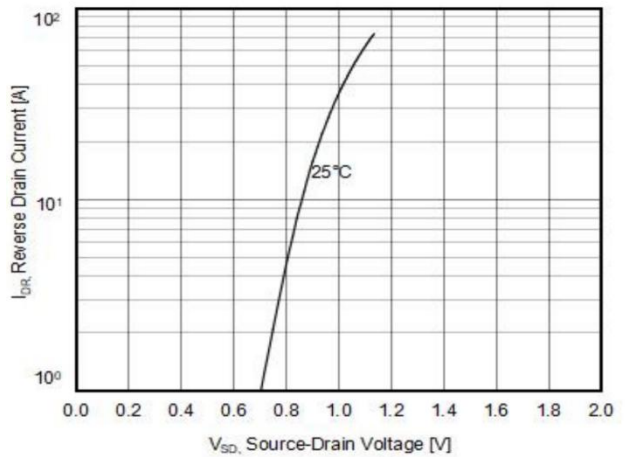


Figure5. Static drain-source on resistance

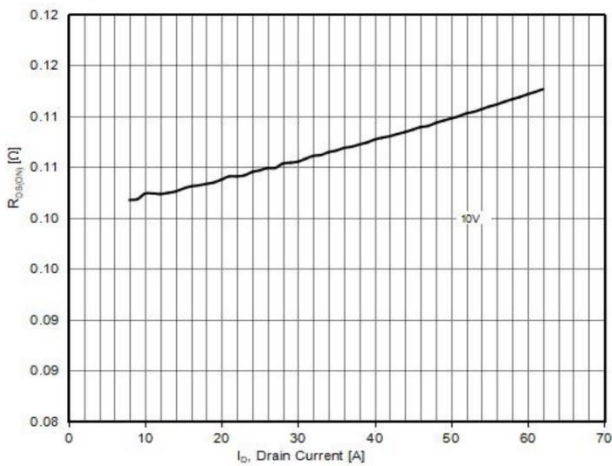
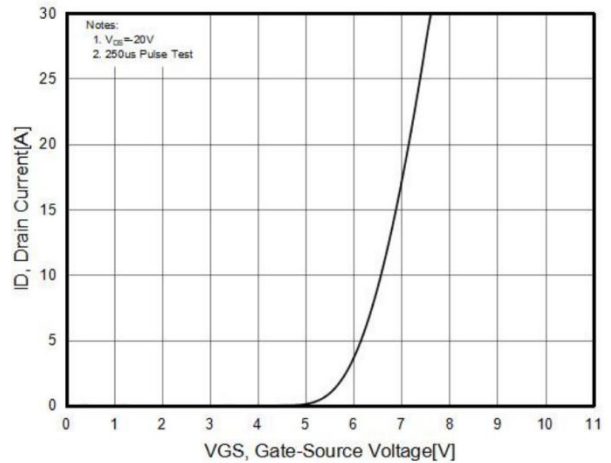
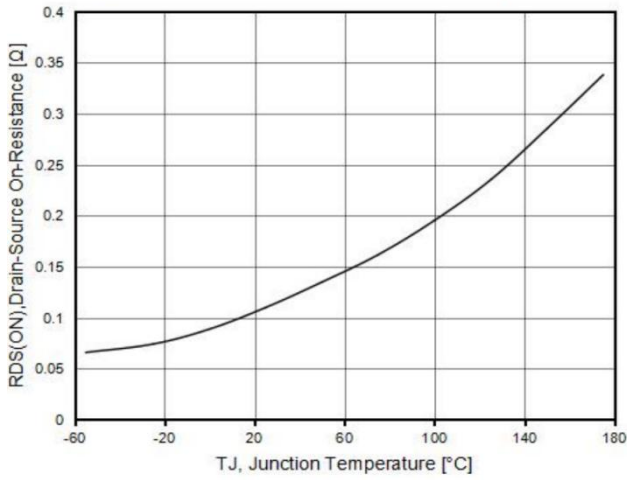


Figure6. Transfer characteristics

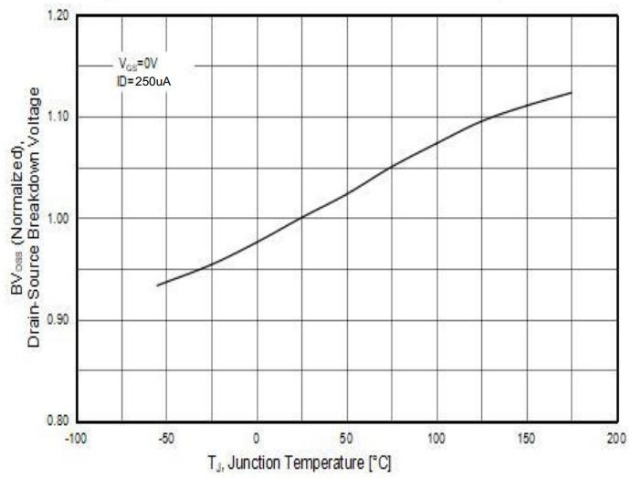


## Typical Characteristics

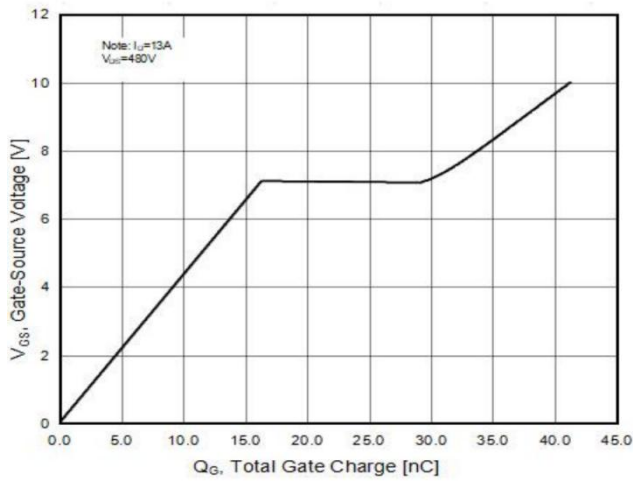
**Figure7.  $R_{DS(ON)}$  vs Junction Temperature**



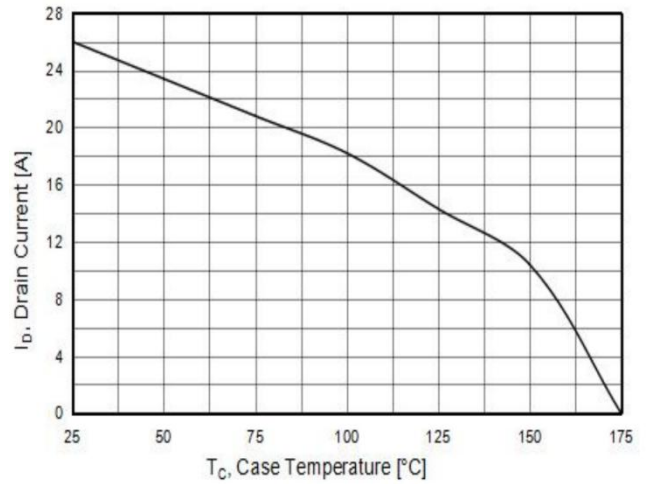
**Figure8.  $BV_{DSS}$  vs Junction Temperature**



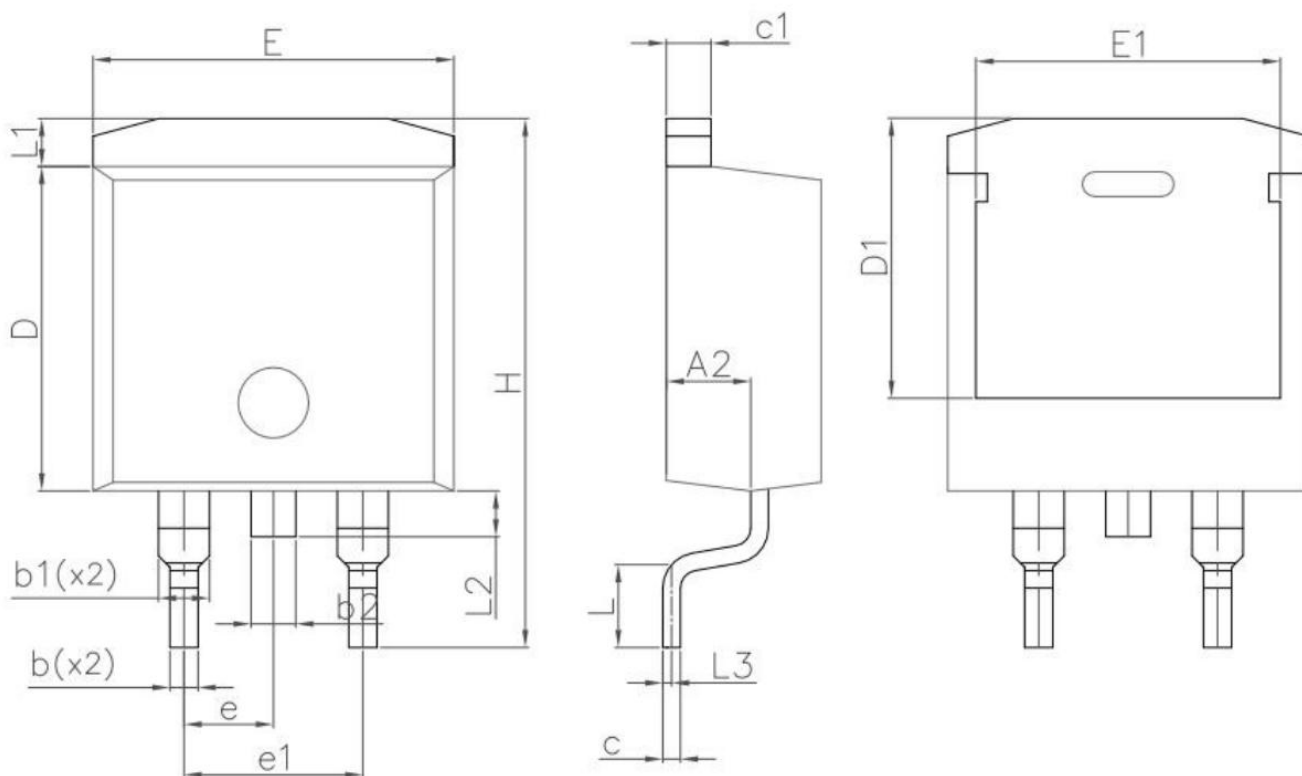
**Figure9. Gate charge waveforms**



**Figure10. Maximum  $I_D$  vs Junction Temperature**

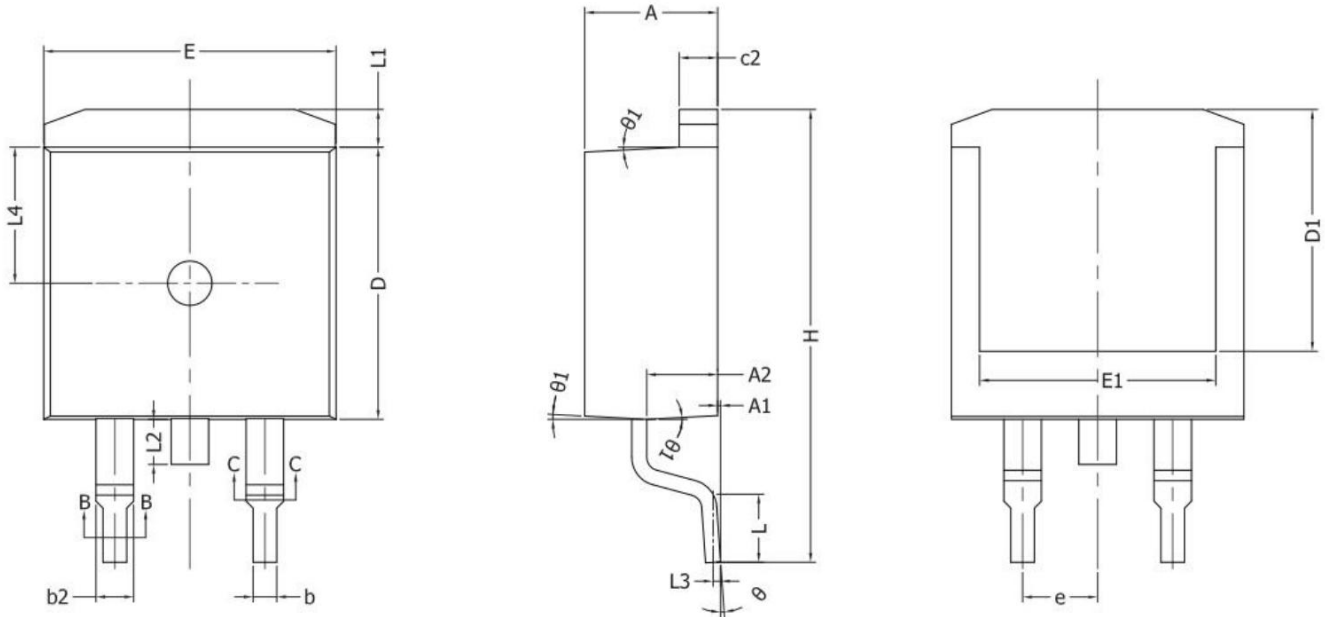


### TO-263AB Package Information



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A2	4.200	4.600	0.165	0.181
b	0.700	0.900	0.028	0.035
b1	1.200	1.750	0.047	0.069
b2	1.170	1.370	0.046	0.054
c	0.400	0.600	0.016	0.024
c1	1.150	1.400	0.045	0.055
D	9.100	9.300	0.358	0.366
D1	7.630	8.230	0.300	0.324
E	10.050	10.450	0.396	0.411
E1	8.350	8.950	0.329	0.352
e	2.540 BSC		0.100 BSC	
e1	5.080 BSC		0.200 BSC	
H	14.610	15.880	0.575	0.625
L	1.780	2.790	0.070	0.110
L1	1.360 REF		0.054 REF	
L2	1.300 REF		0.051 REF	

### TO-263AB Package Information



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	4.400	4.600	0.173	0.181
A1	0.000	0.250	0.000	0.010
A2	2.200	2.600	0.087	0.102
b	0.760	0.890	0.030	0.035
b1	0.750	0.850	0.030	0.033
b2	1.230	1.370	0.048	0.054
b3	1.220	1.320	0.048	0.052
c	0.470	0.600	0.019	0.024
c1	0.460	0.560	0.018	0.022
c2	1.250	1.350	0.049	0.053
D	9.100	9.300	0.358	0.366
D1	8.000	-	0.315	-
E	9.800	10.000	0.386	0.394
E1	7.800	-	0.307	-
e	2.540 BSC		0.100 BSC	
H	14.900	15.700	0.587	0.618
L	2.000	2.600	0.079	0.102
L1	1.170	1.400	0.046	0.055
L2	-	1.750	-	0.069
L3	0.250 REF		0.010 REF	
L4	4.600 REF		0.181 REF	