

Product Summary

$V_{(BR)DSS}$	$R_{DS(on)MAX}$	I_D
100V	5.5mΩ@10V	140A

Feature

- Advanced SGT technology
- Excellent $R_{DS(on)}$
- Low gate charge

Application

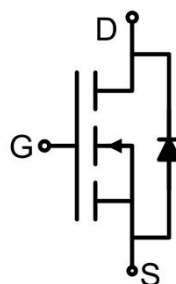
- DC/DC converter
- Power management switches
- LED backlighting

Package

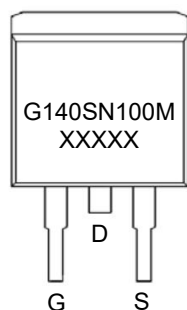


TO-263AB

Circuit diagram



Marking



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

Parameter	Symbol	Value	Unit
Drain-Source Voltage	V _{DS}	100	V
Gate-Source Voltage	V _{GS}	±20	V
Continuous Drain Current ¹⁾ (V _{GS} =10V)	I _D	140	A
Continuous Drain Current ¹⁾ (V _{GS} =10V, T _C =100°C)	I _D (100°C)	85	A
Pulsed Drain Current ²⁾	I _{DM}	417	A
Single Pulse Avalanche Energy ³⁾	E _{AS}	245	mJ
Power Dissipation ⁴⁾	P _D	167	W
Thermal Resistance Junction to Case	R _{θJC}	0.75	°C/W
Operating Junction Temperature	T _J	-55 ~ +150	°C
Storage Temperature	T _{STG}	-55 ~ +150	°C

Electrical characteristics (T_c=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	100			V
Zero gate voltage drain current	I _{DSS}	V _{DS} =100V, V _{GS} =0V, T _J =25°C			1	μA
Gate-body leakage current	I _{GSS}	V _{DS} =0V, V _{GS} =±20V			±100	nA
Gate threshold voltage	V _{GS(th)}	V _{DS} =V _{GS} , I _D =250μA	2	2.9	4	V
Drain-source on-resistance ²⁾	R _{DS(on)}	V _{GS} =10V, I _D =20A		4.6	5.5	mΩ
Dynamic characteristics ⁶⁾						
Input Capacitance	C _{iss}	V _{DS} =50V, V _{GS} =0V, f =1MHz		2816		pF
Output Capacitance	C _{oss}			614		
Reverse Transfer Capacitance	C _{rss}			7.4		
Total Gate Charge	Q _g	V _{DS} =50V, V _{GS} =10V, I _D =20A		42		nC
Gate-Source Charge	Q _{gs}			9.7		
Gate-Drain Charge	Q _{gd}			10.6		
Turn-on delay time	t _{d(on)}	V _{DS} =50V, V _{GS} =10V, I _D =20A R _G =3Ω		13		nS
Turn-on rise time	t _r			25		
Turn-off delay time	t _{d(off)}			43		
Turn-off fall time	t _f			37		
Source-Drain Diode characteristics						
Diode Forward Current ^{1,5)}	I _S	V _D =V _G =0V , Force Current			140	A
Diode Forward voltage ²⁾	V _{SD}	V _{GS} =0V, I _F =20A			1.2	V
Reverse Recovery Time	T _{rr}	I _F =20A, di/dt =100A/μs		60		nS
Reverse Recovery Charge	Q _{rr}			61		nC

Notes:

- 1) The data tested by surface mounted on a 1 inch² FR-4 board with 20Z 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_{DS} = 50V, V_{GS} = 10V, L = 0.4mH, I_{AS} = 42A.
- 4) The power dissipation is limited by 150°C junction temperature.
- 5) The data is theoretically the same as I_D and I_{DM}, in real applications, should be limited by total power dissipation.
- 6) Guaranteed by design, not subject to production testing.

Typical Characteristics

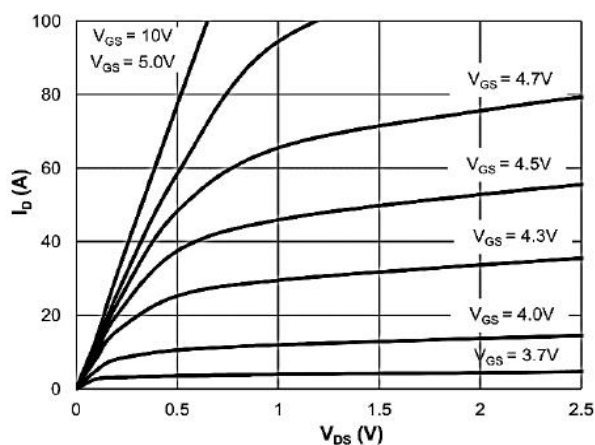


Figure 1: Saturation Characteristics

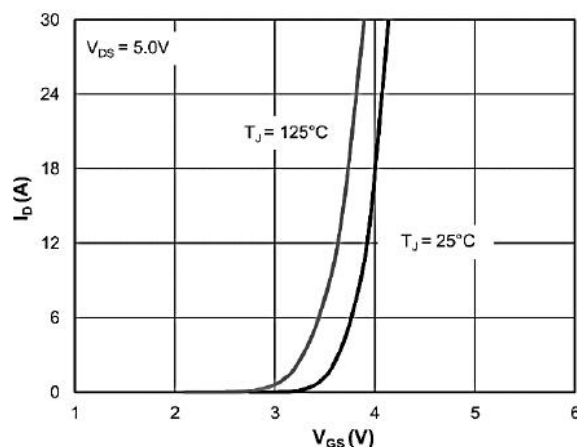


Figure 2: Transfer Characteristics

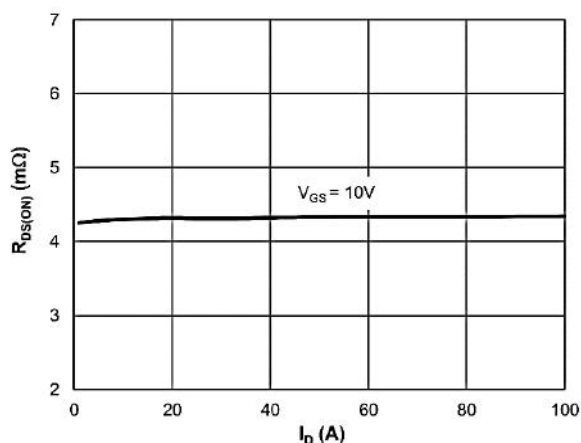


Figure 3: $R_{DS(ON)}$ vs. Drain Current

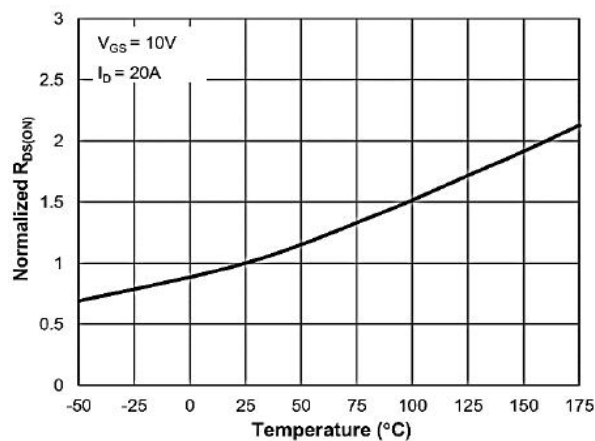


Figure 4: $R_{DS(ON)}$ vs. Junction Temperature

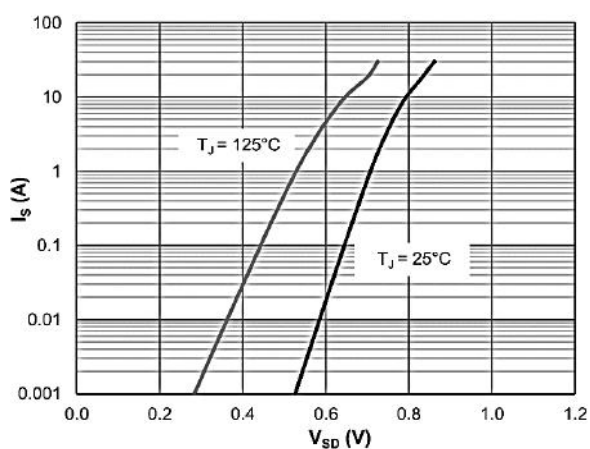


Figure 5: Body-Diode Characteristics

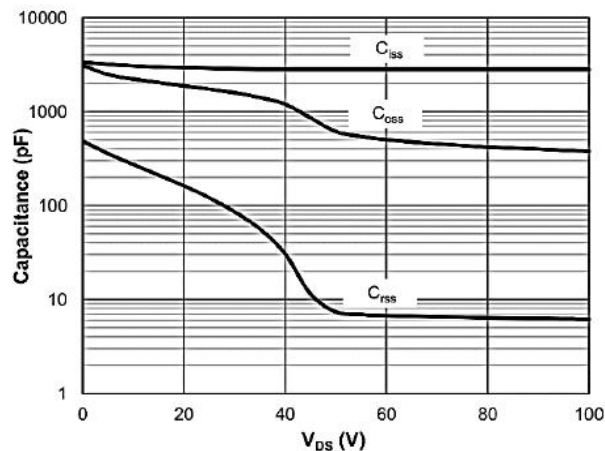


Figure 6: Capacitance Characteristics

Typical Characteristics

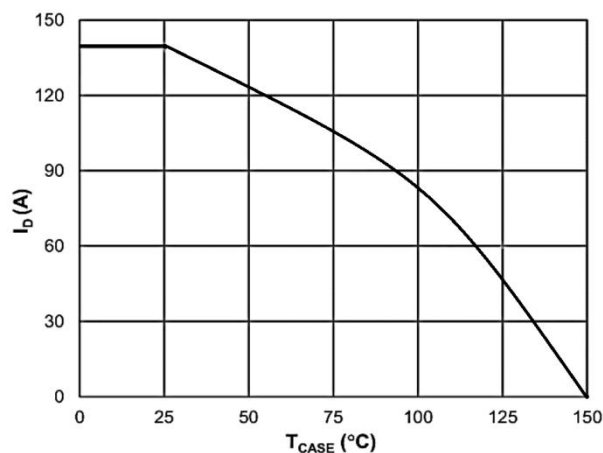


Figure 7: Current De-rating

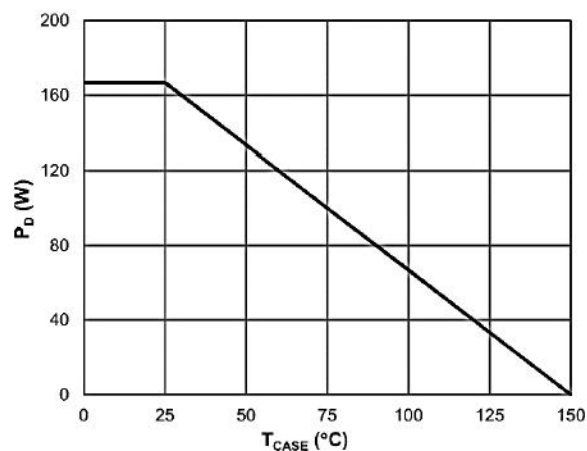


Figure 8: Power De-rating

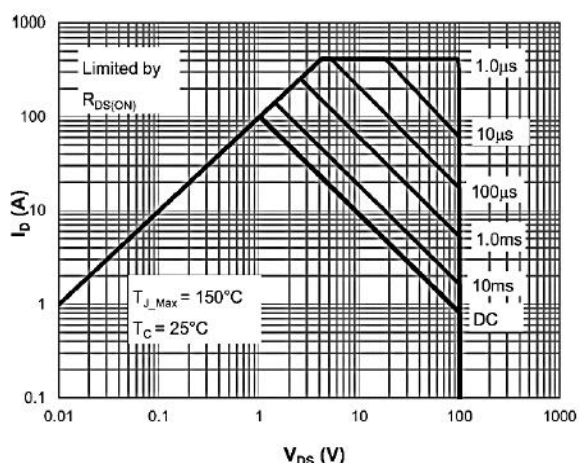


Figure 9: Maximum Safe Operating Area

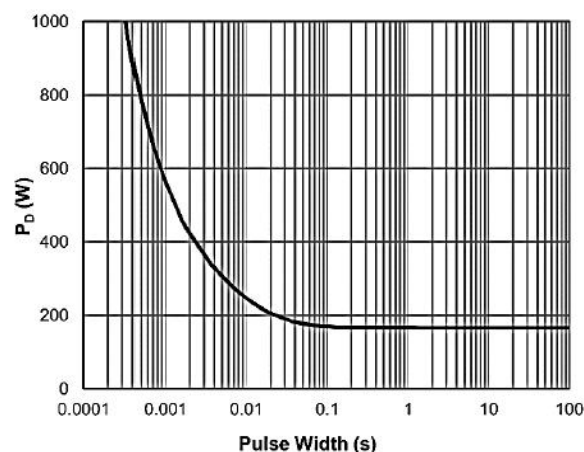


Figure 10: Single Pulse Power Rating, Junction-to-Case

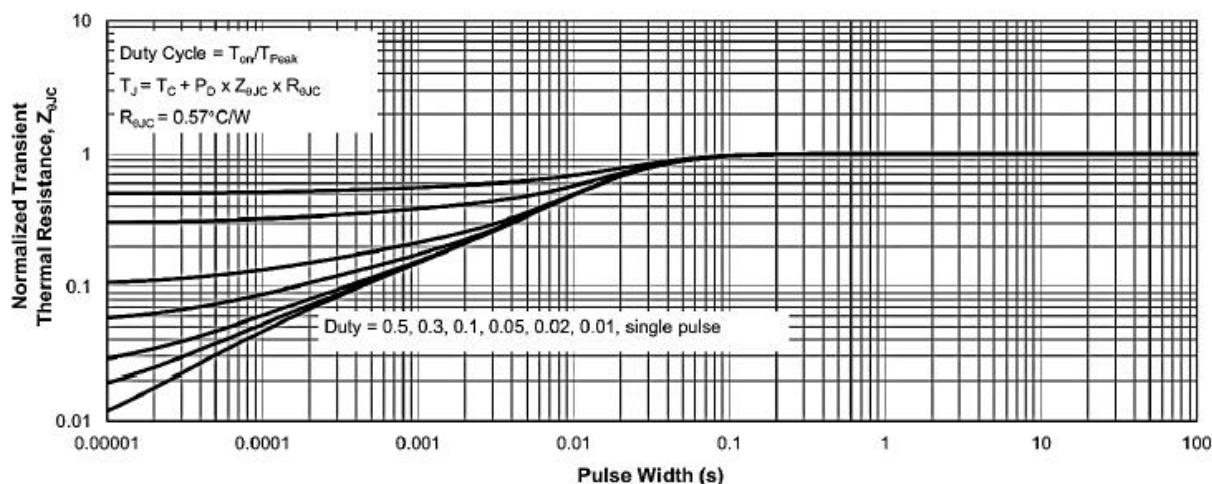
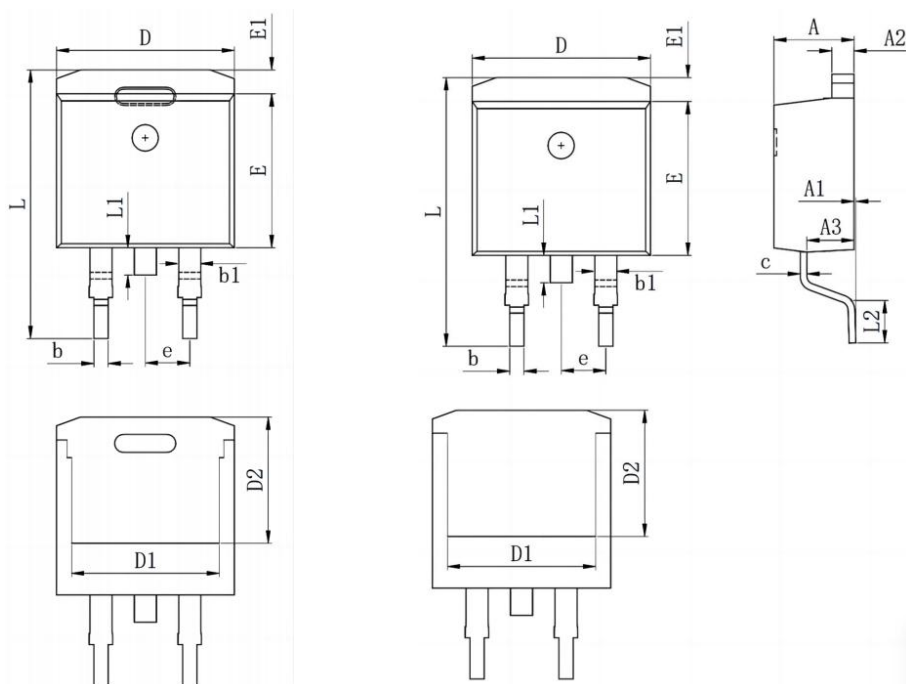


Figure 11: Normalized Maximum Transient Thermal Impedance

TO-263AB Package Information



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	4.370	4.770	0.172	0.188
A1	0.000	0.250	0.000	0.010
A2	1.220	1.420	0.048	0.056
A3	2.490	2.890	0.098	0.114
b	0.700	0.960	0.028	0.038
b1	1.170	1.470	0.046	0.058
c	0.300	0.530	0.012	0.021
D	9.860	10.360	0.388	0.408
D1	8.400 REF.		0.331 REF.	
D2	7.073 REF.		0.278 REF.	
E	8.500	8.900	0.335	0.350
E1	1.070	1.470	0.042	0.058
e	2.540 BSC.		0.100 BSC.	
L	17.70	15.500	0.697	0.610
L1	1.400	1.700	0.055	0.067
L2	2.000	2.600	0.079	0.102
H	6.000	6.850	0.236	0.270
Q	2.600	3.000	0.102	0.118
φ	3.400	3.800	0.134	0.150