N Channel Enhancement

- High speed switching
- Very low switching losses
- Fully controllable dv/dt
- High blocking voltage with low on-resistance
- Fast intrinsic diode with low reverse recovery (Qrr)
- Temperature independent turn-off switching losses
- Halogen free, RoHS compliant

TO-263-7L

- Cooling effort reduction
- Efficiency improvement
- Reduced cooling requirements
- Increased power density
- Increased system switching frequency



- On-board charger/PFC
- EV battery chargers
- Booster/DC-DC converter
- Switch mode power supplies

		(T_C = 25 , $R_{th\ (j-c),max}$)	(V_{GS} = 18V, I_D = 34A, T_J = 25)			
SG2M025075JJ	750V	98A	25mΩ	175	SG2M025075JJ	TO-263-7

(Tc = 25°C unless otherwise specified)

$V_{DS,max}$	Drain source voltage	750	V	V_{GS} = 0V, I_D = 100μA	
$V_{GS,max}$	Gate source voltage	-8 /+22	V	Absolute maximum values	Note1
$V_{GSpulse}$	Gate-source voltage,max. transient				

(Tc = 25°C unless otherwise specified)

$V_{(BR)DSS}$	Drain-source breakdown voltage	750	-	-	V	V_{GS} = 0V, I_D =

Q_{gs}	Gate source charge	-	20	-	nC	V_{DS} = 500V, V_{GS} = -4/+18V I_D = 34A	Fig.12
Q_{gd}	Gate drain charge	-	18	-			
Q_g	Gate charge	-	61	-			

(Tc = 25°C unless otherwise specified)

E_{on}	Turn on switching energy	-	151	-	μJ	V_{DS} = 500V, V_{GS} = -4/+18V I_D = 34A, Rg = 2.5Ω L = 16.7μH	Fig.26
E_{off}	Turn off switching energy	-	43	-			
$t_{d\ on}$	Turn on delay time	-	13.8	-	ns		Fig.27
t_r	Rise time	-	11.6	-			
$t_{d\ off}$	Turn off delay time	-	26.4	-			
t_f	Fall time	-	8.8	-			

V_{SD}	Diode forward voltage	-	3.7	-	V	V_{GS} = -4V, I_{SD} = 17A	Fig.8,9,10
		-	3.3	-	V	V_{GS} = -4V, I_{SD} = 17A T_J = 175°C	
I_S	Continuous diode forward current	-	80	-	A	V_{GS} = -4V, Tc = 25°C	Note2
t_{rr}	Reverse recovery time	-	16	-	ns	V_R = 500V, V_{GS} = -4V I_{SD} = 34A di/dt = 2763A/μs T_J = 175°C	
Q_{rr}	Reverse recovery charge	-	161	-	nC		
I_{rrm}	Peak reverse recovery current	-	17	-	A		

Note 2: When using SiC Body Diode the maximum recommended V_{GS} = -4 V

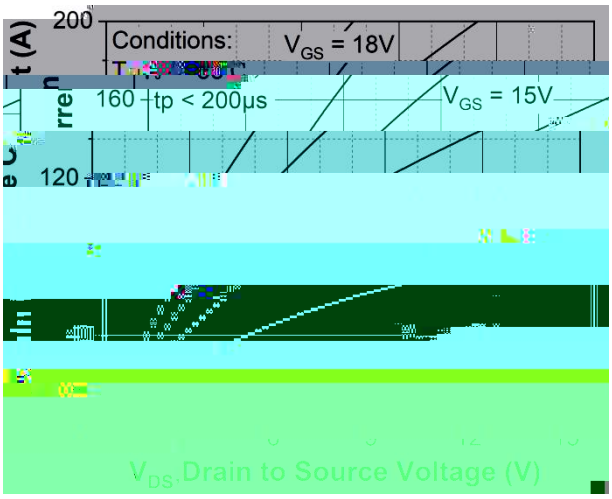


Figure 1. Output characteristics T_J = -55 ºC

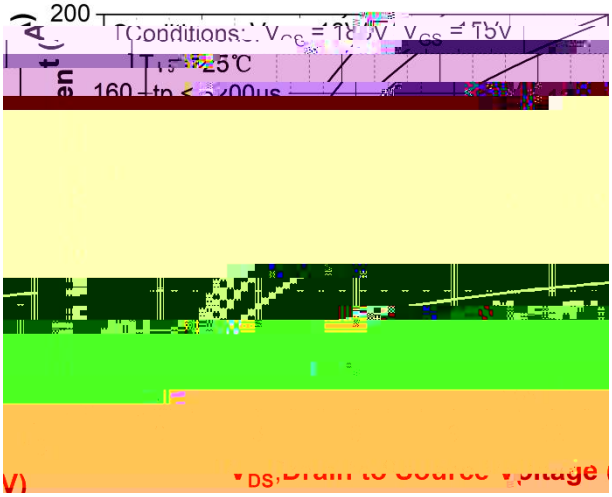


Figure 2. Output characteristics T_J = 25 ºC

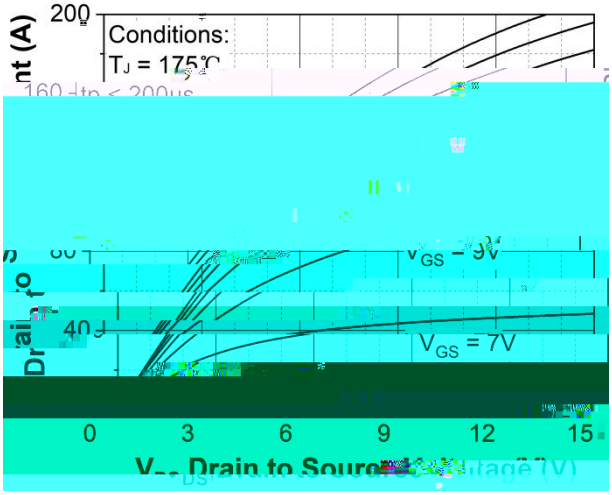


Figure 3. Output characteristics T_J = 175 ºC

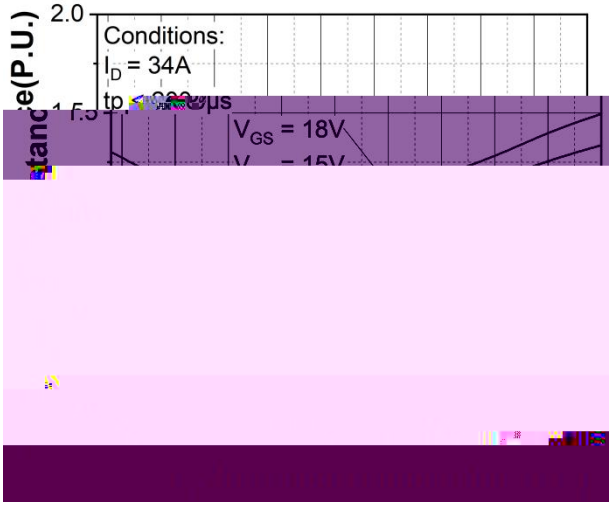


Figure 4. Normalized on-resistance vs. temperature

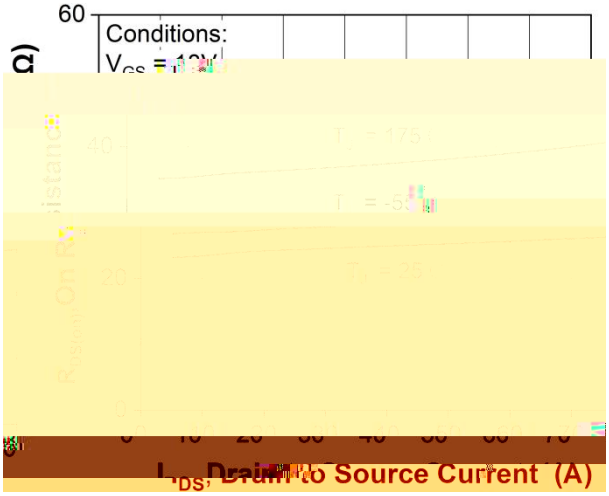


Figure 5. On-resistance vs. drain current for various temperatures

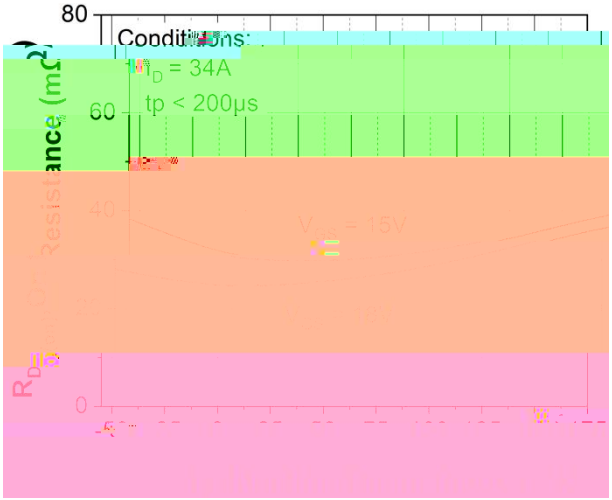


Figure 6. On-resistance vs. temperature for various gate voltages

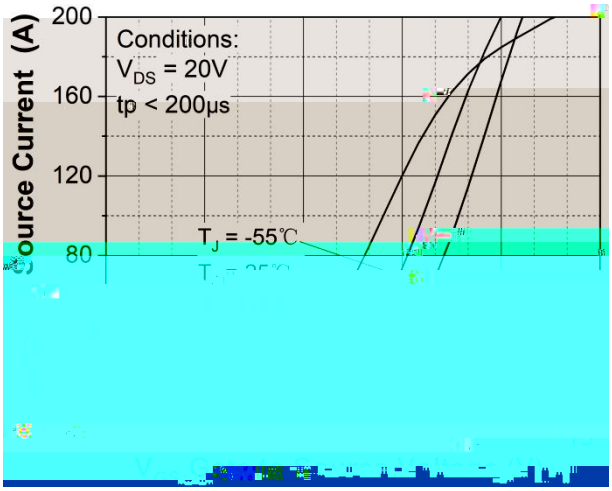


Figure 7. Transfer characteristic for various junction temperatures

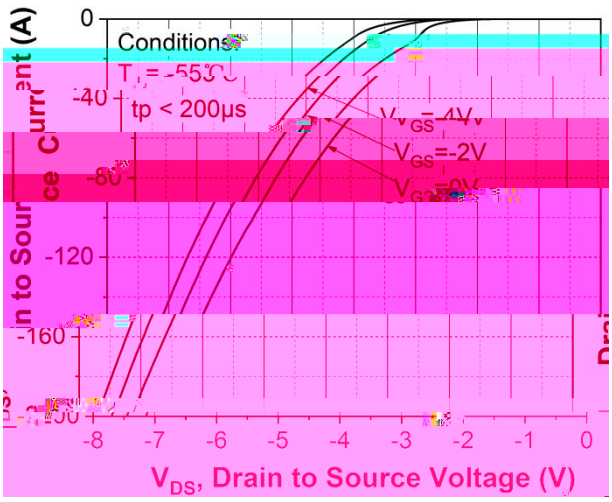


Figure 8. Body diode characteristic at T_J = -55 ºC

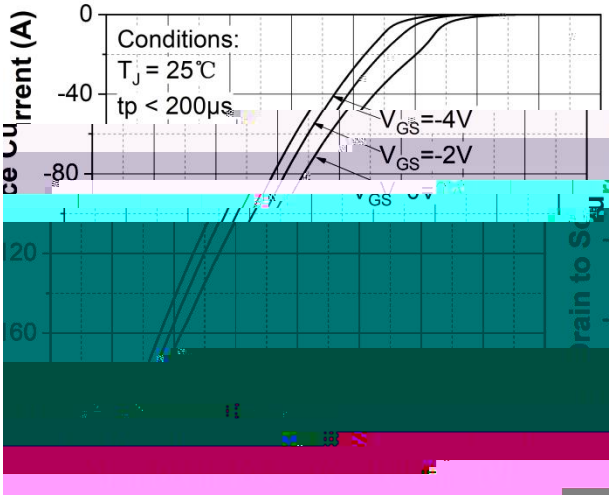


Figure 9. Body diode characteristic at T_J = 25 ºC

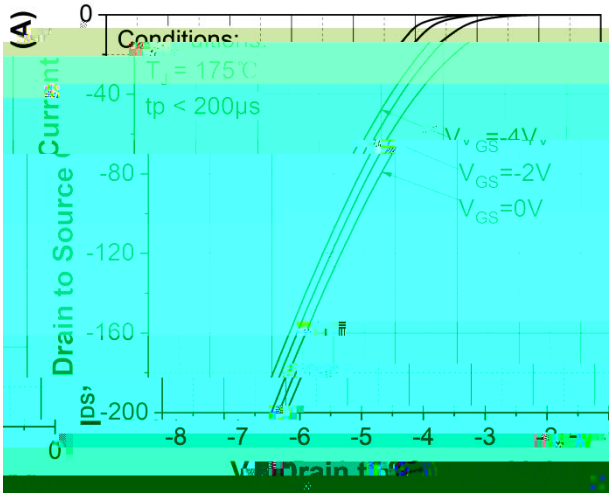


Figure 10. Body diode characteristic at T_J = 175ºC

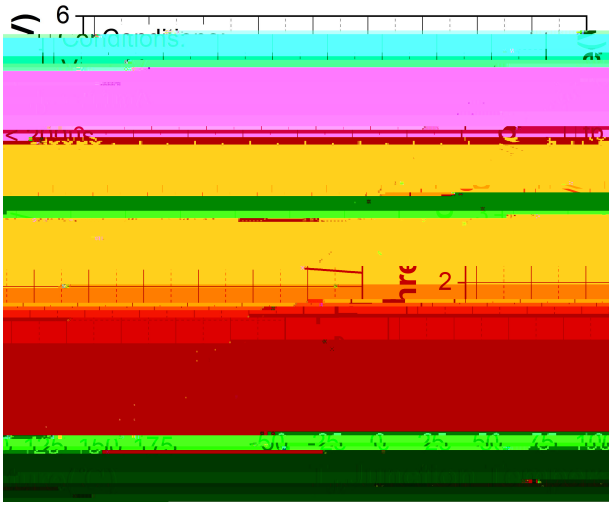


Figure 11. Threshold voltage vs. temperature

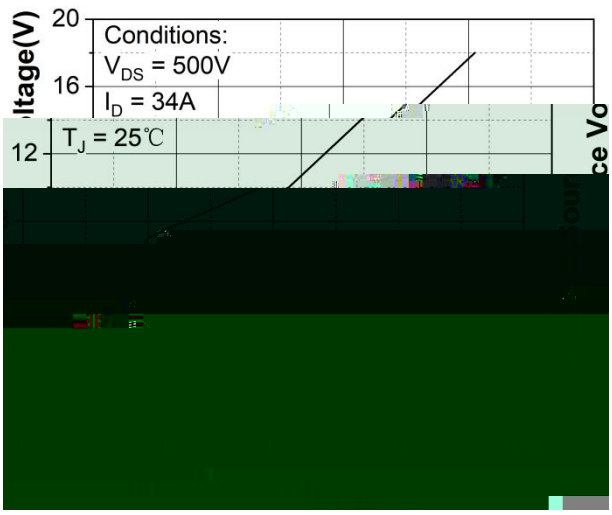


Figure 12. Gate charge characteristic

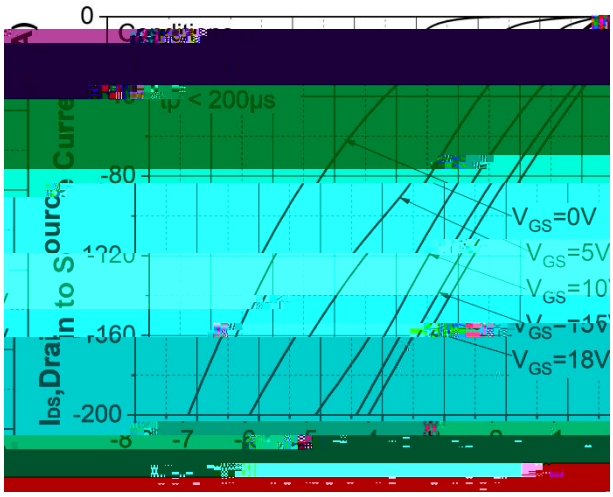


Figure 13. 3rd quadrant characteristic at T_J = -55 ºC

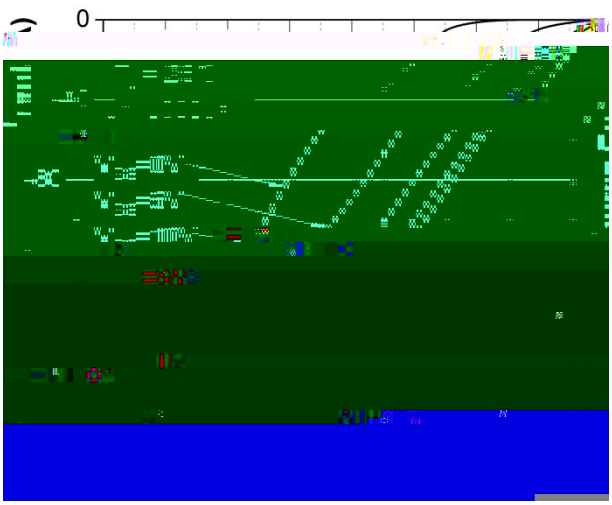


Figure 14. 3rd quadrant characteristic at T_J = 25 ºC

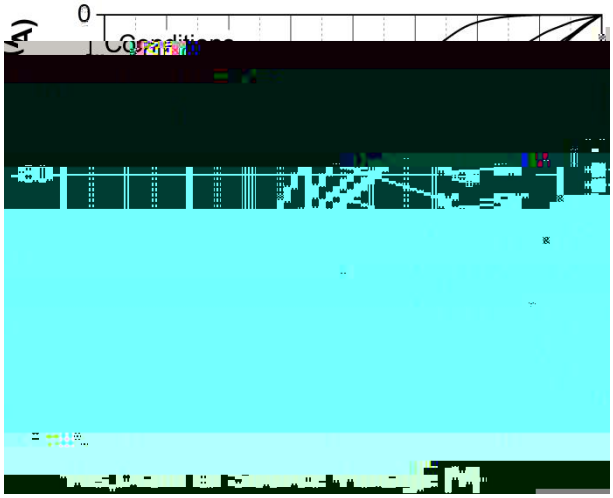


Figure 15. 3rd quadrant characteristic at T_J = 175 ºC

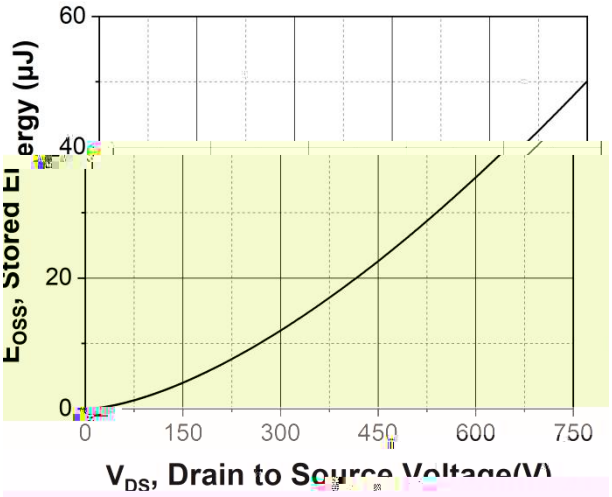


Figure 16. Output capacitor stored energy

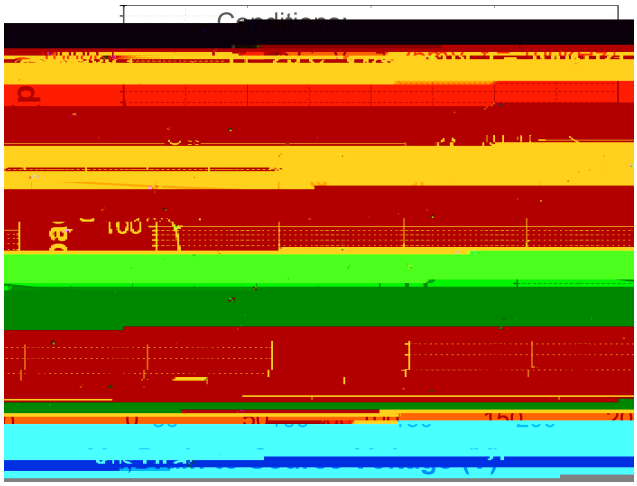


Figure 17. Capacitances vs. drain-source voltage (0 - 200V)

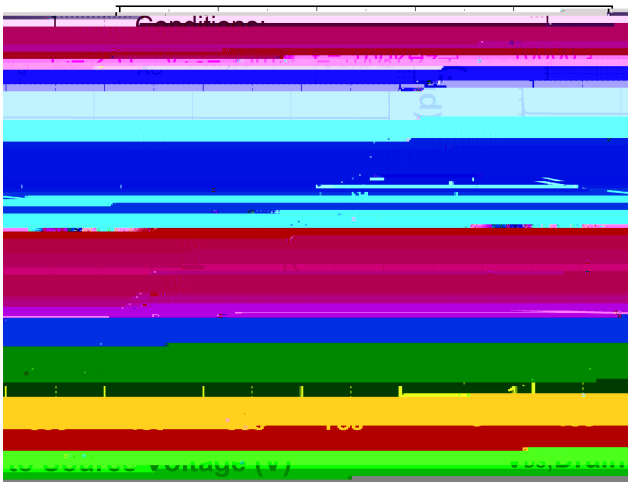


Figure 18. Capacitances vs. drain-source voltage (0 - 750V)

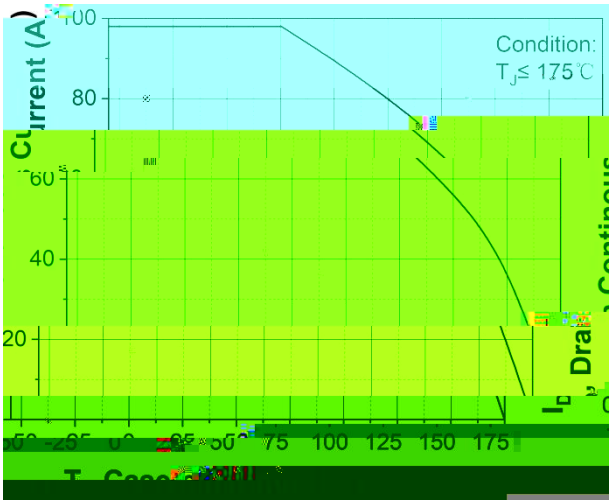


Figure 19. Continuous drain current derating vs. case temperature

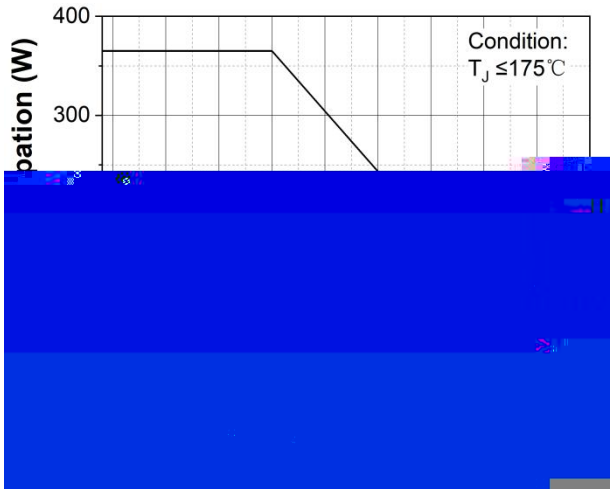


Figure 20. Maximum power dissipation derating vs. case temperature

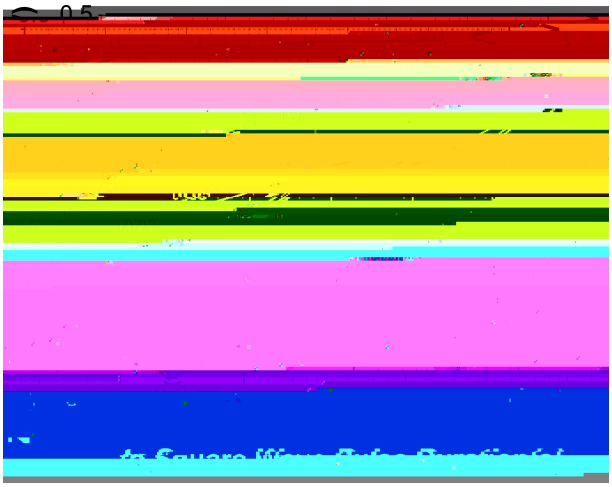


Figure 21. Transient thermal impedance (junction - case)

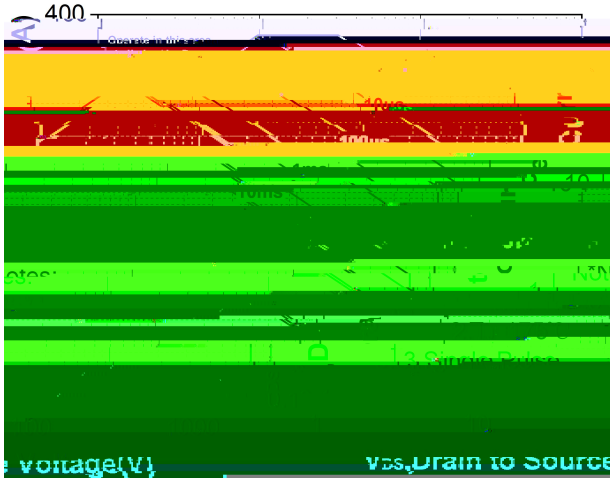


Figure 22. Safe operating area

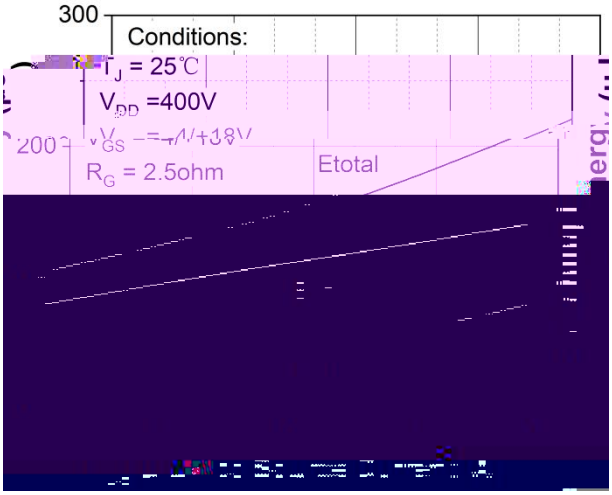


Figure 23. Clamped Inductive switching energy vs. drain current (V_{DD} = 400V)

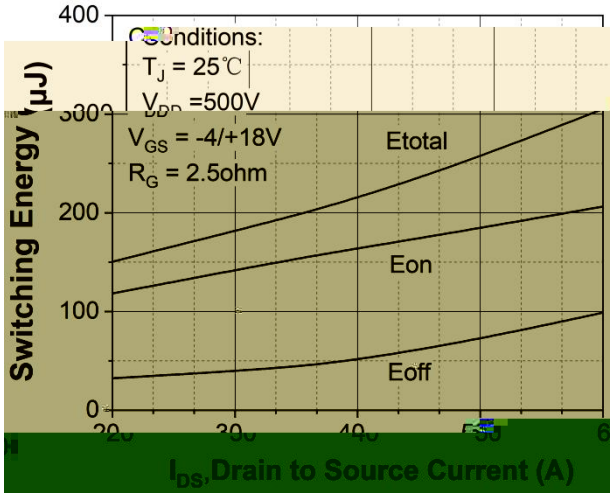


Figure 24. Clamped inductive switching energy vs. drain current (V_{DD} = 500V)

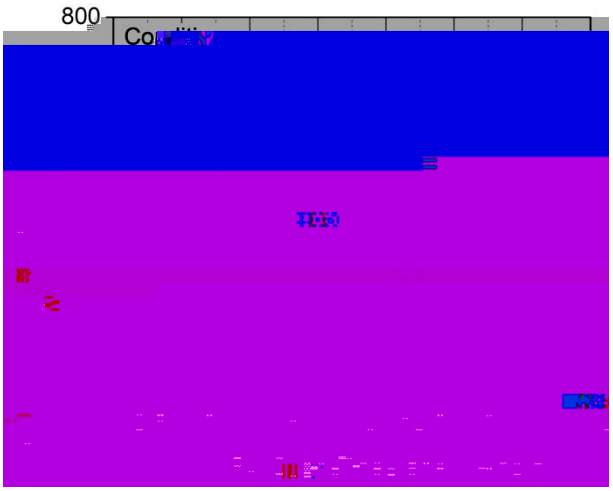


Figure 25. Clamped inductive switching energy vs. R_G (ext)

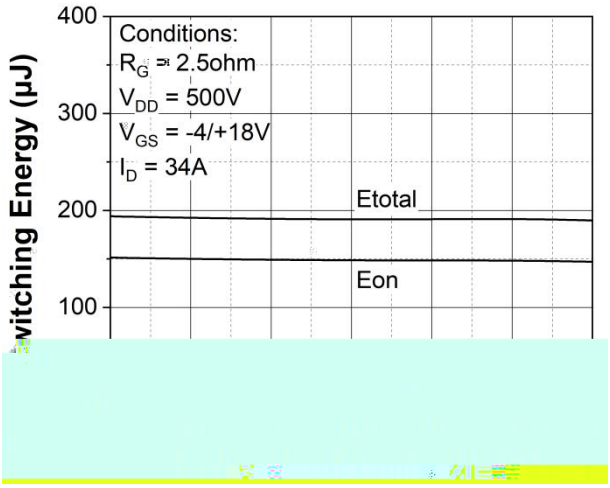


Figure 26. Clamped inductive switching energy vs. temperature

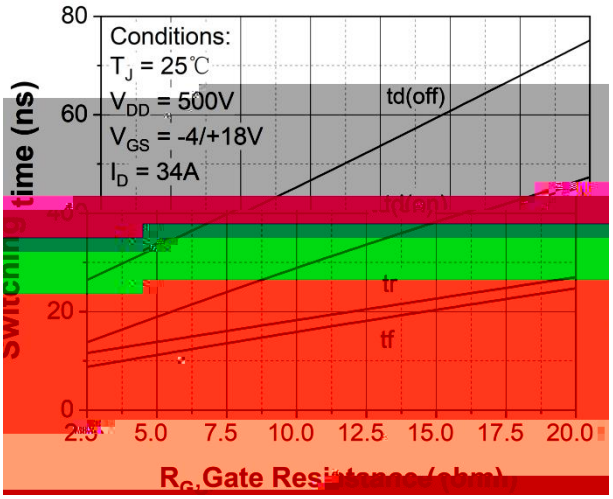
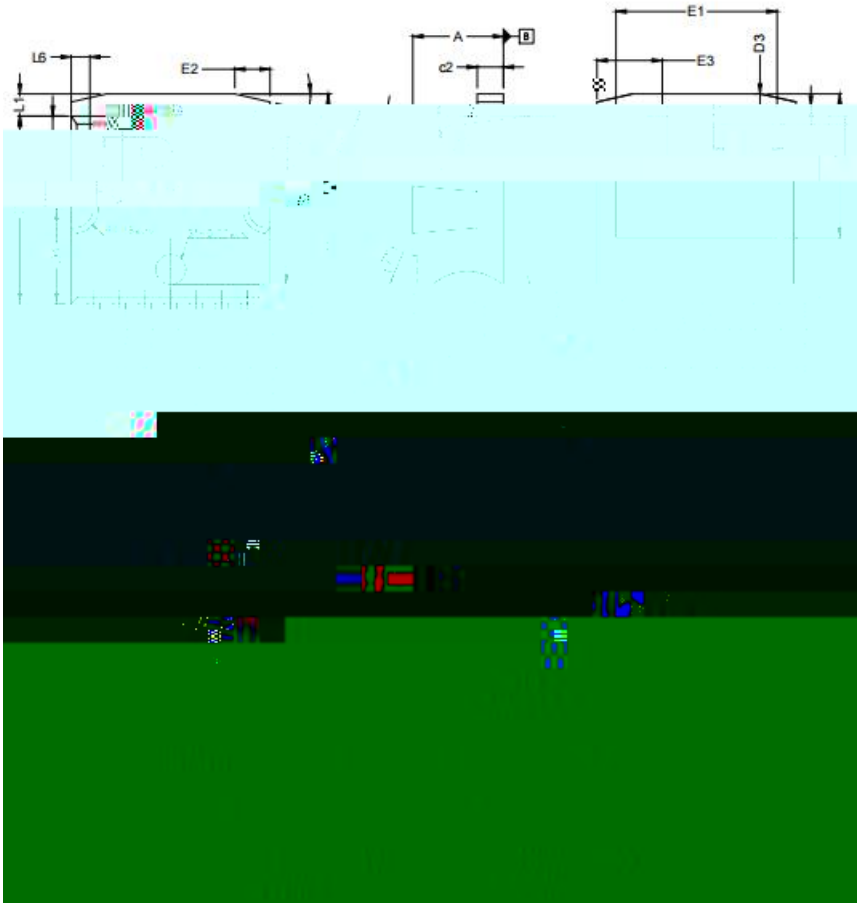
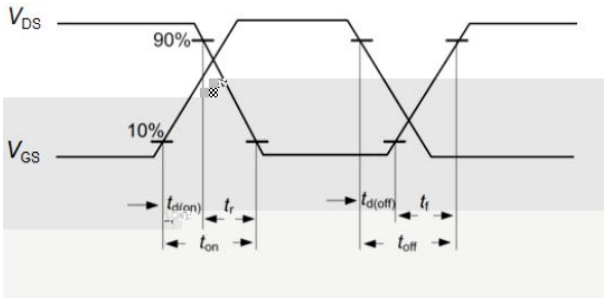


Figure 27. Switching times vs. R_G (ext)

(TO-263-7L-A)



SYMBOL	MIN	MAX	SYMBOL	MIN	MAX
A	4.30		L	1.78	2.79
A1		0.25			
				1.04BSC	
b3	0.60	0.75	L6	0.93BSC	
c	0.45	0.60	H	14.61	15.88
	0.45	0.55			
c2					



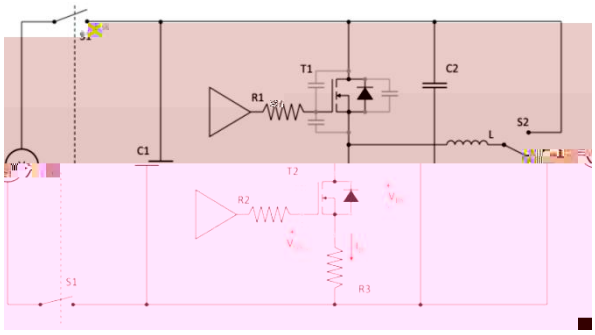


Figure A. Definition of switchjfĎ ή D

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1.
The levels of RoHS restricted materials in this product are below the maximum concentration values (also referred to as the threshold limits) permitted for such substances, or are used in an exempted application, in accordance with EU Directive 2011/65/ EC (RoHS2), as implemented January 2, 2013.

2.
REACh substances of high concern (SVHCs) information is available for this product. Since the European Chemical Agency (ECHA) has published notice of their intent to frequently revise the SVHC listing for the foreseeable future, please contact a Sichain representative to insure you get the most up-to-date REACh SVHC Declaration. REACh banned substance information (REACh Article 67) is also available upon request.

3. With respect to information regarding the application of the product, Sichain hereby disclaims any and all warranties and liabilities of any kind, including without limitation warranties of non-infringement of intellectual property rights of any third party.

4. Any information given in this documents subject to customer's compliance with its obligations and any applicable legal requirements, norms and standards concerning any use of the product of Sichain in any customer's applications.

5. Specifications of any and all products described or contained herein stipulate the performance, characteristics, and functions of the described products in the independent state, and are not guarantees of the performance,characteristics,and functions of the described products as mounted in the customer's products or equipment.

6. Due to technical requirements products may contain dangerous substances. For information on the types in question please contact Sichain office.

7. Except as otherwise explicitly approved by Sichain in a written document signed by authorized representatives of Sichain, Sichain' products may not be used in any applications where a failure of the product or any consequences of the use thereof can reasonably be expected to result in personal injury.

8. For use of our products in applications requiring a high degree of reliability (as exemplified below), please contact and consult with a Sichain representatives, for example but not limited to: transportation equipment,primary communication equipment,traffic lights,fire/crime prevention, safety equipment, medical systems, and power transmission systems.