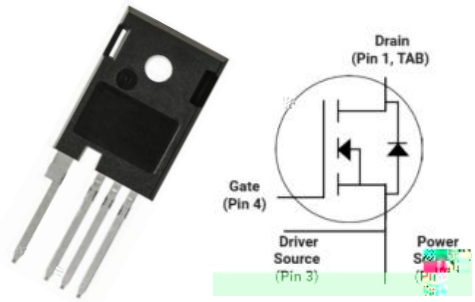
N Channel Enhancement

- 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-247-4L

- 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 , $R_{th\ (j\text{-}c),max}$)	(V_{GS} = 18V, I_D = 38A, T_J = 25)			
SG2M040170HJ	1700V	66A	40mΩ	175	SG2M040170HJ	TO-247-4L

(Tc = 25°C unless otherwise specified)

$V_{DS,max}$	Drain source voltage	1700	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 voltage	-10 /+25	V	$t_p \leq 0.5\mu s$, D 0.01	
V_{GSop}	Gate source voltage	-4 /+18	V	Recommended operational values	
I_D	Continuous drain current	66 47	A	V_{GS} = 18V, T_C = 25˚C V_{GS} = 18V, T_C = 100˚C	Fig.19
I_D(pulse)	Pulsed drain current	188	A	Pulse width t_P=100μs limited by $T_{J,max}$	Fig.22
P_D	Power dissipation	384	W	T_C = 25˚C,T_J = 175˚C	Fig.20
T_J , T_{stg}	Operating Junction and storage temperature	-5 i			

(Tc = 25°C unless otherwise specified)

$V_{(BR)DSS}$	Drain-source breakdown voltage	1700	-	-	V	V_{GS} = 0V, I_D = 100μA	
$V_{GS(th)}$	Gate threshold voltage	2.5	3.1	4	V	V_{DS} = V_{GS}, I_D = 12mA	Fig.11
		-	2.4	-	V	V_{DS} = V_{GS}, I_D = 12mA T_J = 175°C	
I_{DSS}	Zero gate voltage drain current	-	-	10	μA	V_{DS} = 1700V, V_{GS} = 0V	
I_{GSS}	Gate source leakage current	-	-	100	nA	V_{GS} = 18V, V_{DS} = 0V	
$R_{DS(on)}$	Current drain-source on-state resistance	-	47	65	mΩ	V_{GS} = 15V, I_D = 38A	Fig.4,5,6
		-	91	-		V_{GS} = 15V, I_D = 38A, T_J = 175°C	
		-	40	52		V_{GS} = 18V, I_D = 38A	
		-	88	-		V_{GS} = 18V, I_D = 38A, T_J = 175°C	
g_{fs}	Transconductance	-	23	-	S	V_{DS} = 20V, I_D = 38A	Fig.7
		-	22	-		V_{DS} = 20V, I_D = 38A, T_J = 175°C	
$R_{g,int}$	Intenl gate resistance	-	1.4	-	Ω	V_{AC} = 25mV, f = 1MHz, open drain	

(Tc = 25°C unless otherwise specified)

C_{iss}	Input capacitance	-	2594	-	pF	V_{DS} = 1400V, V_{GS} = 0V T_J = 25°C, V_{AC} = 25mV f = 100kHz	Fig.17, 18
C_{oss}	Output capacitance	-	102	-			
C_{rss}	Reverse capacitance	-	5	-			
E_{oss}	Coss stored energy	-	106	-	μJ		Fig.16

Q_{gs}	Gate source charge	-	26	-	nC	V_{DS} = 1200V, V_{GS} = -4/+18V I_D = 38A	Fig.12
Q_{gd}	Gate drain charge	-	24	-			
Q_g	Gate charge	-	78	-			

(Tc = 25°C unless otherwise specified)

E_{on}	Turn on switching energy	-	722	-	μJ	V_{DS} = 1200V, V_{GS} = -4/+18,



Figure 1. Output characteristics T_J = -55 ºC

Figure 2. Output characteristics T_J = 25 ºC

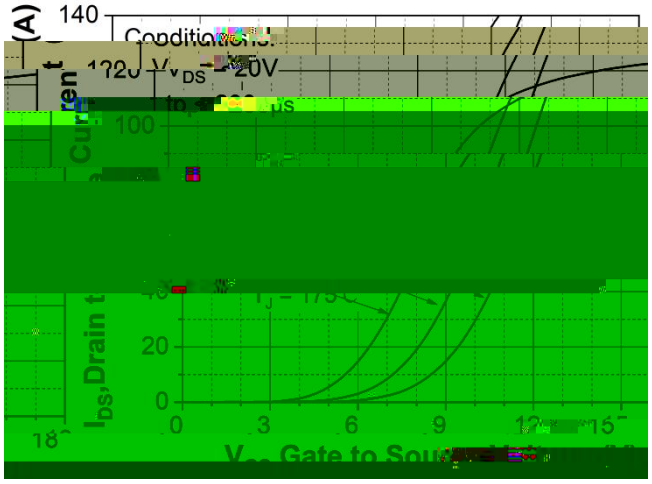


Figure 7. Transfer characteristic for various junction temperatures

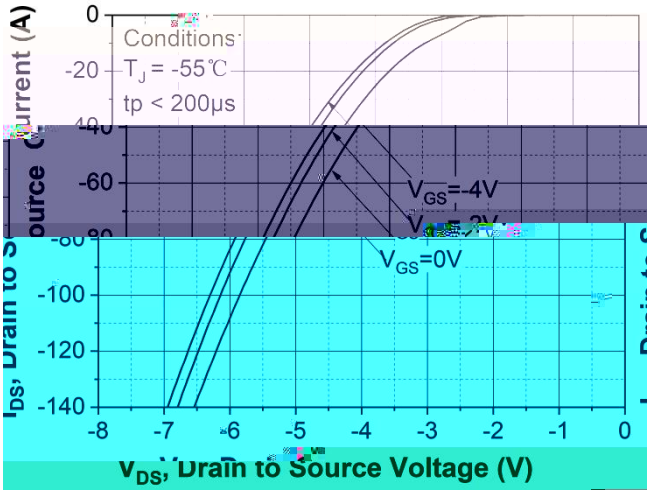


Figure 8. Body diode characteristic at T_J = -55 ºC

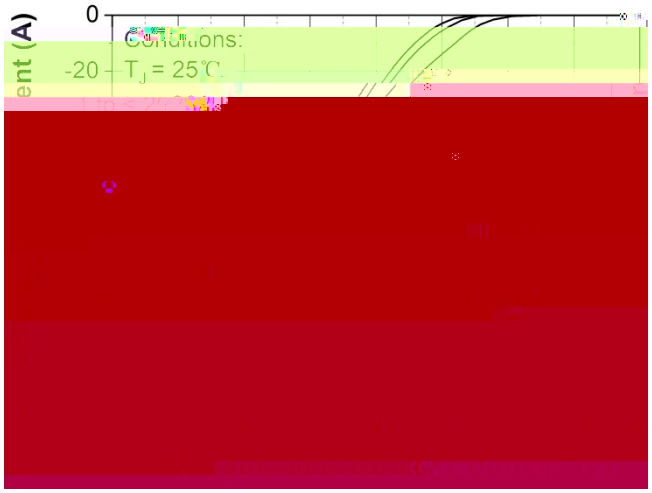


Figure 9. Body diode characteristic at T_J = 25 ºC

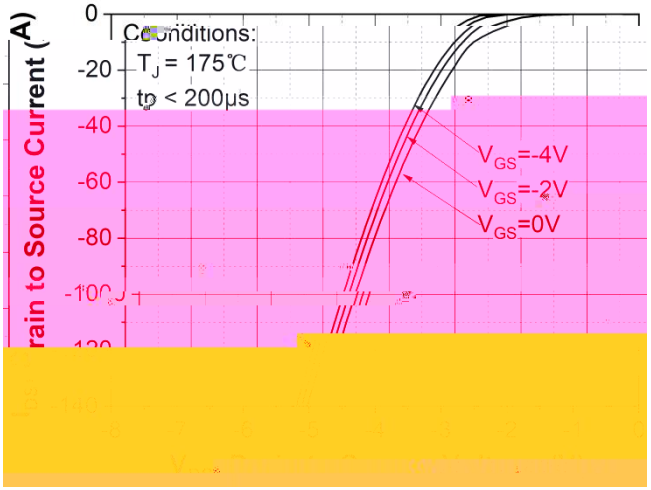


Figure 10. Body diode characteristic at T_J = 175ºC

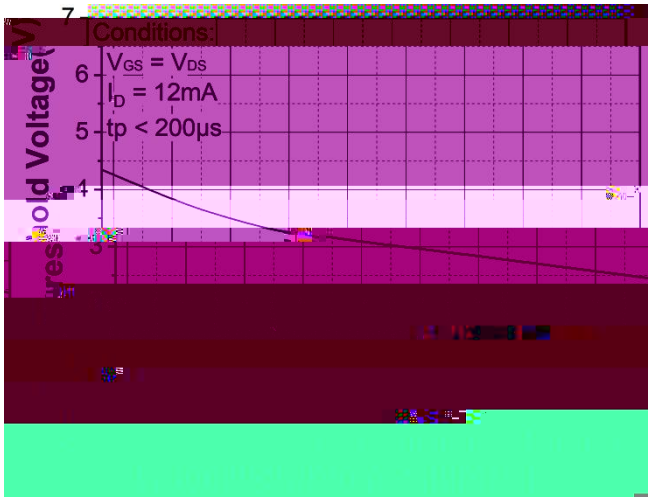


Figure 11. Threshold voltage vs. temperature

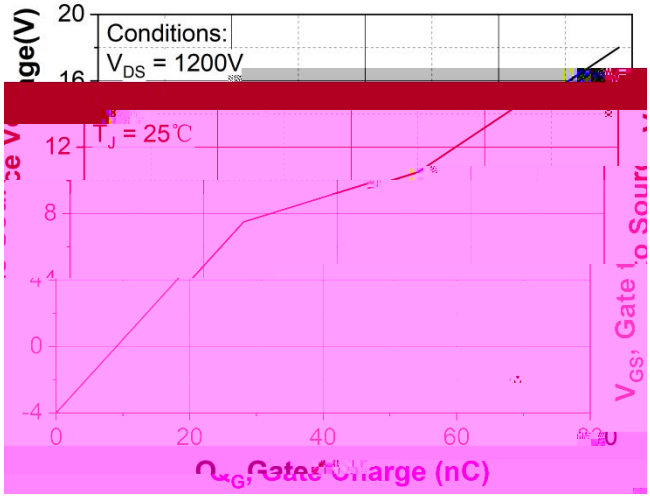


Figure 12. Gate charge characteristic

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

Figure 14. 3rd quadrant characteristic at T_J

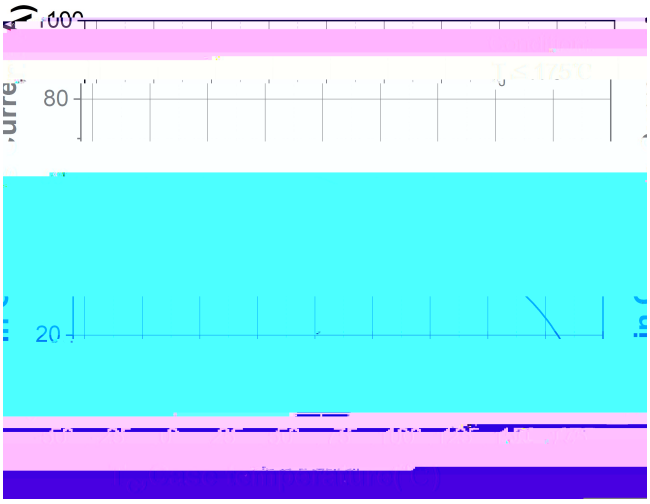


Figure 19. Continuous drain current derating vs. case temperature

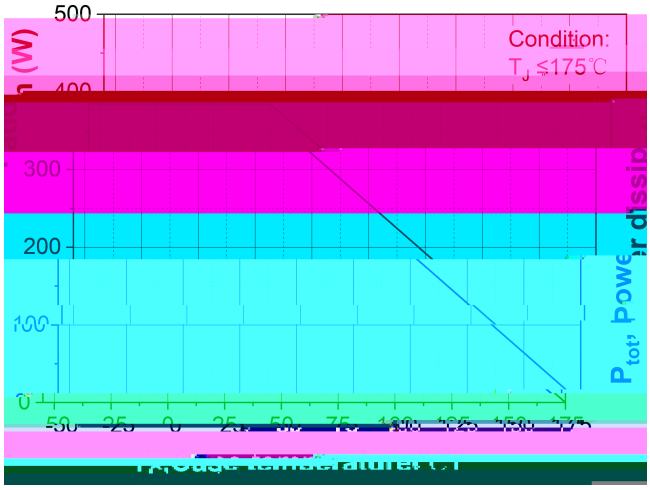


Figure 20. Maximum power dissipation derating vs. case temperature

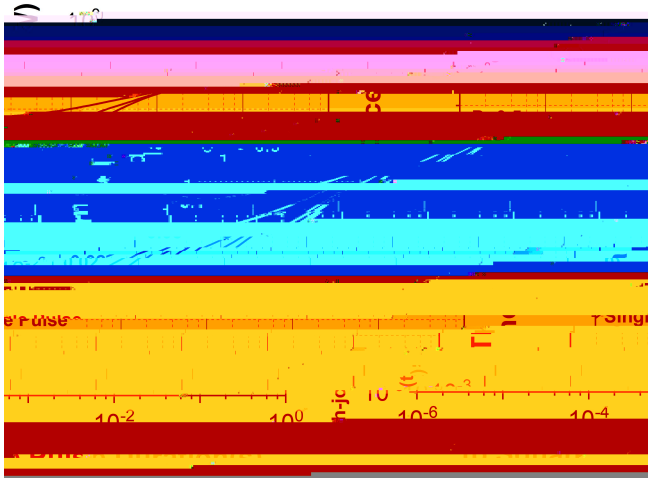


Figure 21. Transient thermal impedance (junction - case)

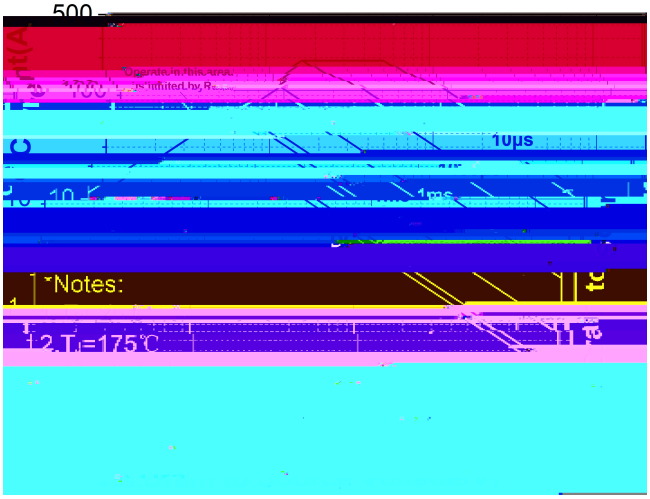


Figure 22. Safe operating area

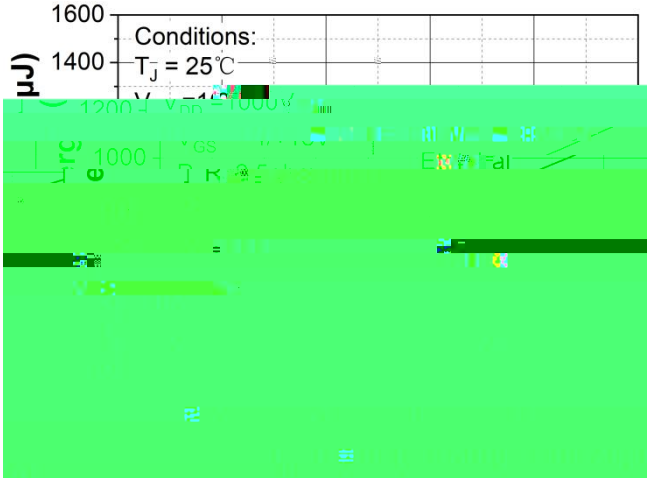


Figure 23. Clamped Inductive switching energy vs. drain current (V_{DD} = 1000V)

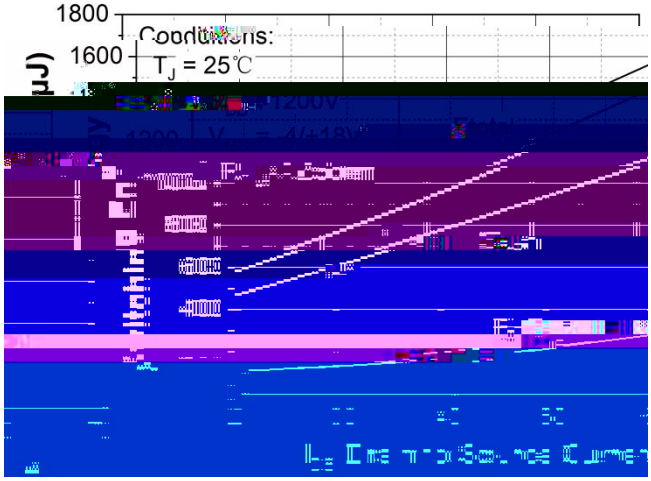


Figure 24. Clamped inductive switching energy vs. drain current (V_{DD} = 1200V)

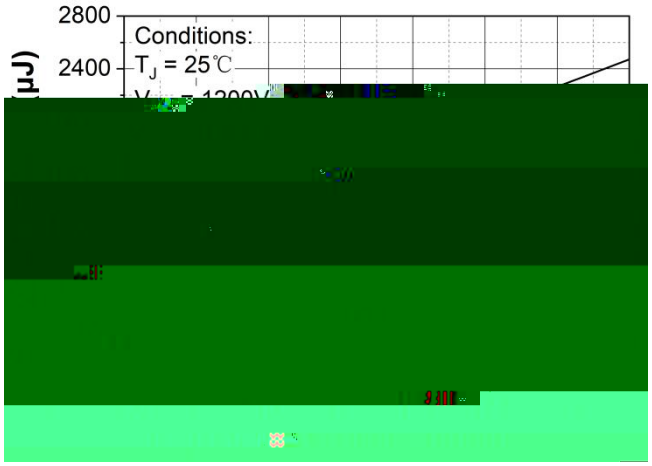


Figure 25. Clamped inductive switching energy vs. R_G(ext)

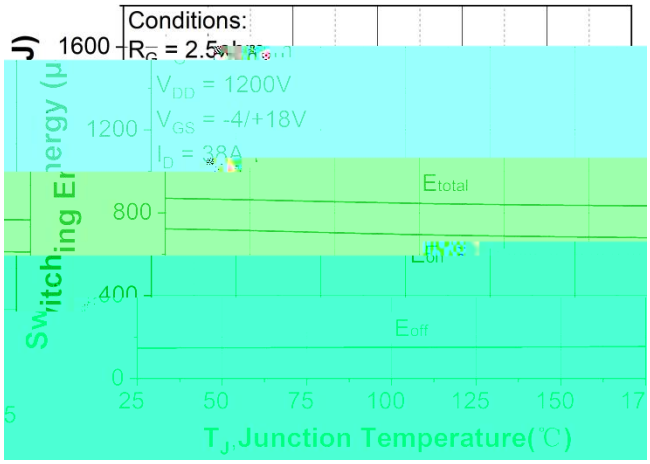


Figure 26. Clamped inductive switching energy vs. temperature

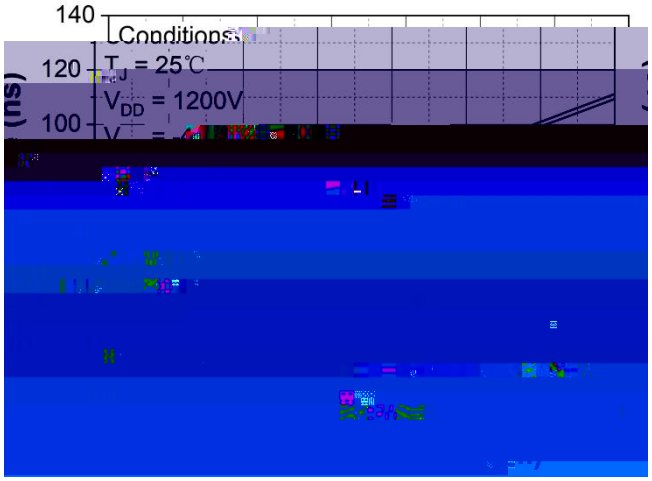


Figure 27. Switching times vs. R_G(ext)

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.