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 switching losses
- Halogen free, RoHS compliant

S3M030120BJ	2.80 * 3.64

- Cooling e] reduction
- E] improvement
- Reduced cooling requirements
- Increased power density
- Increased system switching frequency

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

(T_C = 25 , (V_{GS} = 18V, I_D = 26A 8 Þ'

$R_{th\ (jc,max}$ ≤ 0.64 °C/W)



(Tc = 25°C unless otherwise specified)

$V_{DS,max}$	Drain source voltage	1200	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	65	A	V_{GS} = 18V, T_C = 25˚C	
		46		V_{GS} = 18V, T_C = 100˚C	
I_D(pulse)	Pulsed drain current	176	A	Pulse width t_P =100μs limited by $T_{J,max}$	
T_J ,T_{stg}	Operating Junction and storage temperature	-55 to +175	˚C		

Note 1 when using MOSFET Body Diode $V_{GS,max}$ = -4 / +22V

(Tc = 25°C unless otherwise specified)

$V_{(BR)DSS}$	Drain-source breakdown voltage	1200	-	-	V	V_{GS} = 0V, I_D = 100μA	
$V_{GS(th)}$	Gate threshold voltage	2.3	2.8	3.8	V	V_{DS} = V_{GS}, I_D = 9mA	Fig.11
		-	2.2	-	V	V_{DS} = V_{GS}, I_D = 9mA T_J = 175°C	
I_{DSS}	Zero gate voltage drain current	-	1	10	μA	V_{DS} = 1200V, 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	-	35	50	mΩ	V_{GS} = 15V, I_D = 26A	Fig.4,5,6
		-	60	-		V_{GS} = 15V, I_D = 26A, T_J = 175°C	
		-					

Q_{gs}	Gate source charge	-	16	-	nC	V_{DS} = 800V, V_{GS} = -4/+1

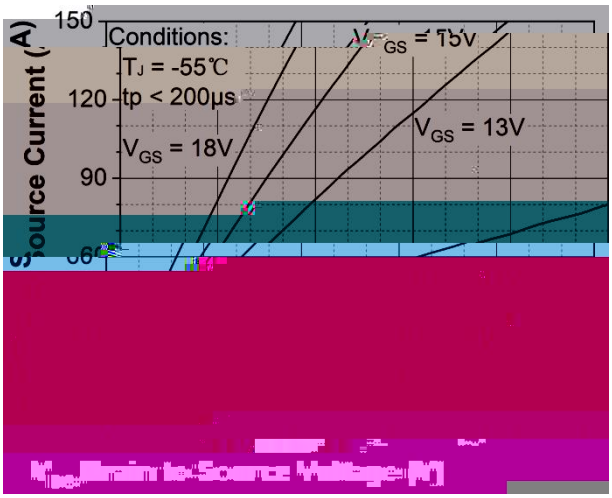


Figure 1. Output characteristics T_J = -55 ºC



Figure 2. Output characteristics T_J = 25 ºC

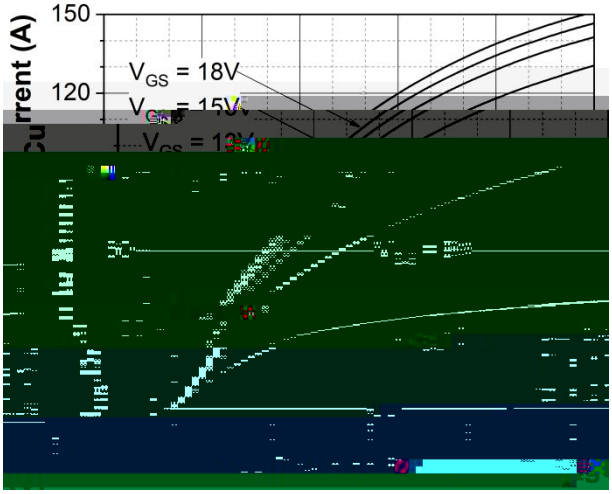


Figure 3. Output characteristics T_J = 175 ºC

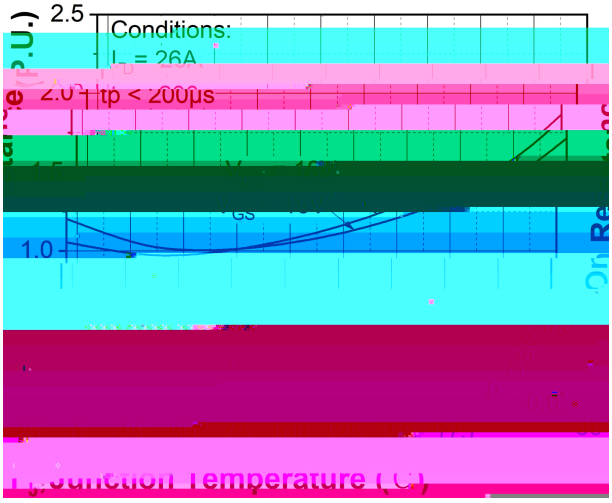


Figure 4. Normalized on-resistance vs. temperature

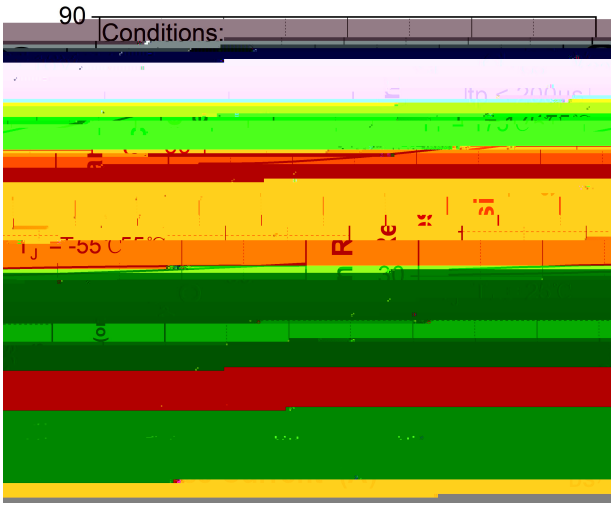


Figure 5. On-resistance vs. drain current for various temperatures



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

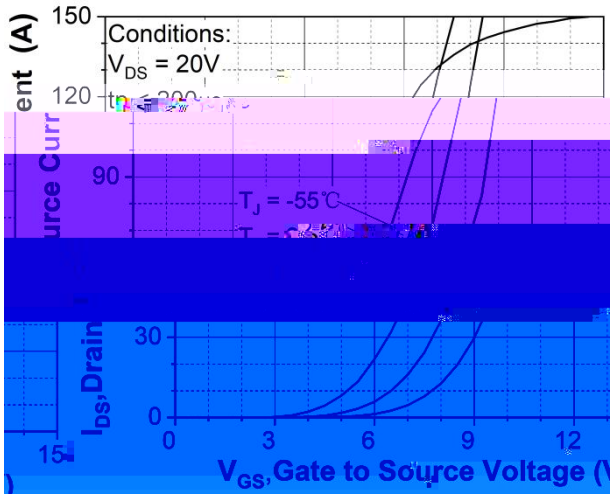


Figure 7. Transfer characteristic for various junction temperatures

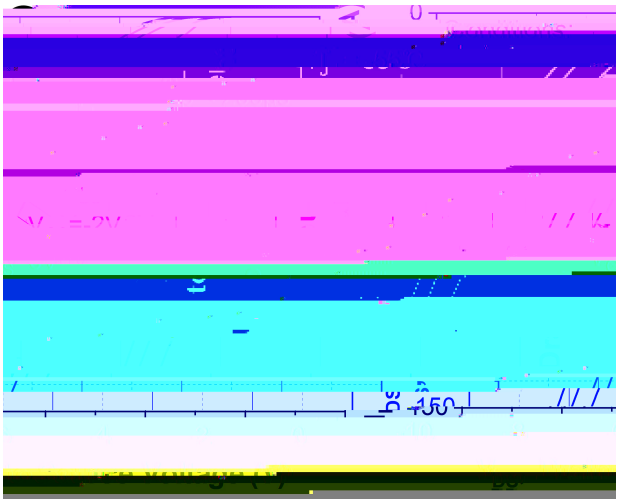


Figure 8. Body diode characteristic at T_J = -55 ºC

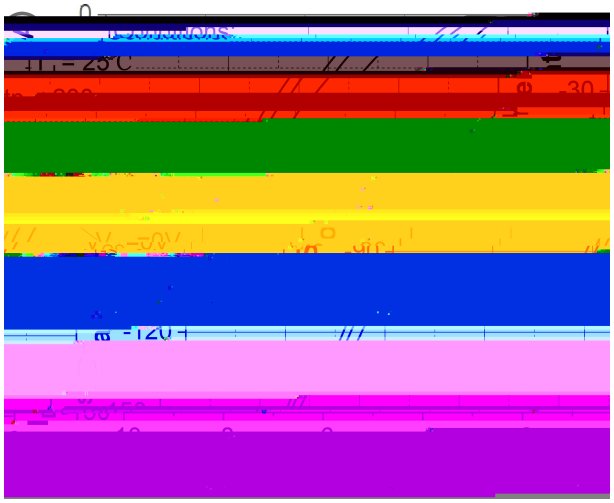


Figure 9. Body diode characteristic at T_J = 25 ºC

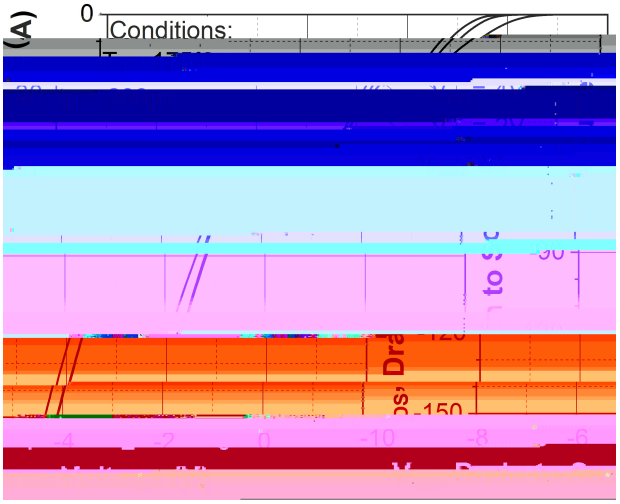


Figure 10. Body diode characteristic at T_J = 175ºC

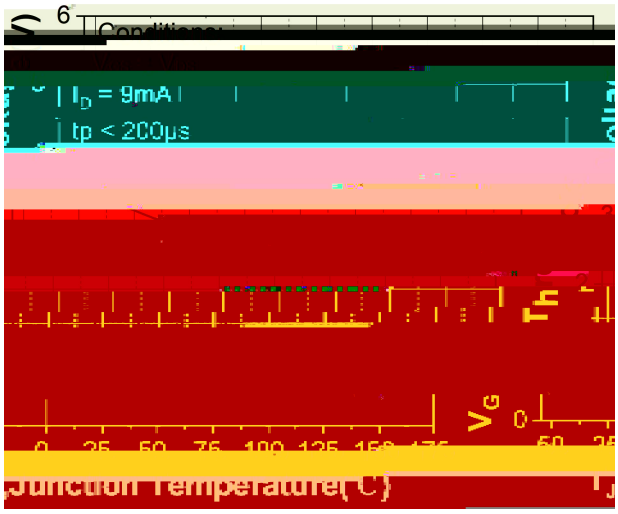


Figure 11. Threshold voltage vs. temperature

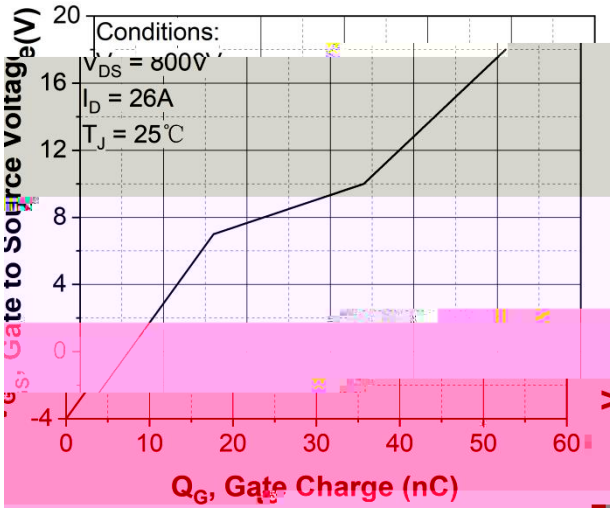


Figure 12. Gate charge characteristic

Die size W x L	2.80 * 3.64	mm	
Gate pad size W x L	0.70 * 0.50	mm	
Die thickness	150	μm	
Top side source gate metallization	4	μm	AlCu

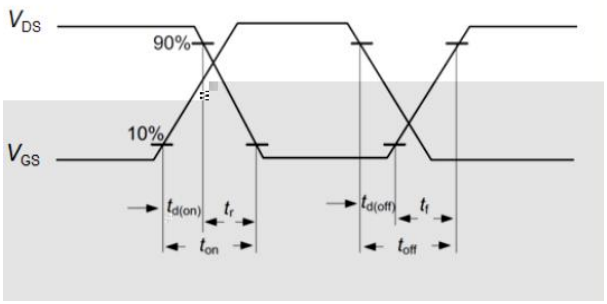


Figure A. Definition of switching times

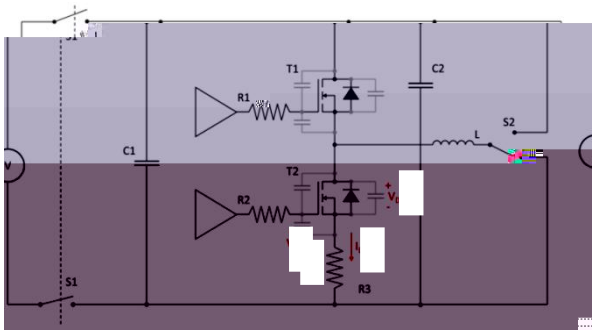


Figure B. Dynamic test circuit

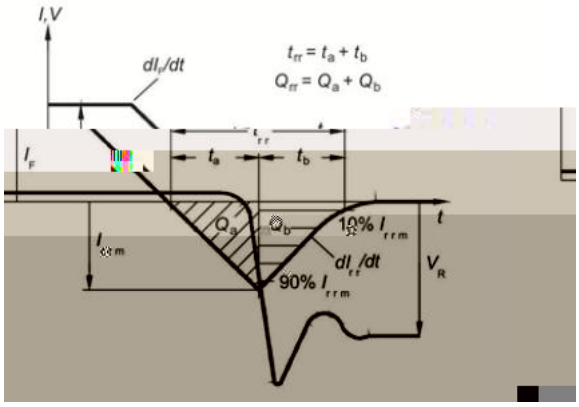


Figure C. Definition of body diode switching characteristics

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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/EU (RoHS 2), as implemented January 2, 2013.

2.

REACh substances of high concern (SVHCs) information is available

Datasheet