

- ★ 100% EAS Guaranteed
- ★ Green Device Available
- ★ Super Low Gate Charge
- ★ Excellent CdV/dt effect decline
- ★ Advanced high cell density Trench technology

Product Summary

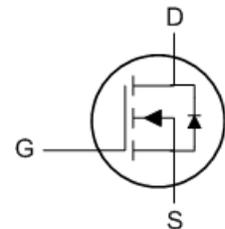
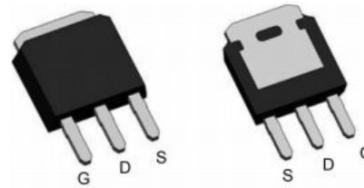


BVDSS	RDSON	ID
60V	25mΩ	20A

Description

The XR20N06Z is the high cell density trench N-ch MOSFETs, which provide excellent RDSON and gate charge for most of the synchronous buck converter applications. The XR20N06Z meet the RoHS and Green Product requirement, 100% EAS guaranteed with full function reliability approved.

TO251 Pin Configuration



Absolute Maximum Ratings (T_C=25°C unless otherwise specified)

Symbol	Parameter	Max.	Units	
V _{DSS}	Drain-Source Voltage	60	V	
V _{GSS}	Gate-Source Voltage	±20	V	
I _D	Continuous Drain Current	T _C = 25°C	20	A
		T _C = 100°C	10	A
I _{DM}	Pulsed Drain Current ^{note1}	80	A	
EAS	Single Pulsed Avalanche Energy ^{note2}	39	mJ	
P _D	Power Dissipation	41.7	W	
R _{θJC}	Thermal Resistance, Junction to Case	50	°C/W	
T _J , T _{STG}	Operating and Storage Temperature Range	-55 to +175	°C	

Electrical Characteristics (T_J = 25°C, unless otherwise noted)

Parameter	Symbol	Test Conditions	Min.	Typ.	Max.	Unit	
Static Characteristics							
Drain-Source Breakdown Voltage	V _{(BR)DSS}	V _{GS} = 0V, I _D = 250μA	60	-	-	V	
Gate-Body Leakage Current	I _{GSS}	V _{DS} = 0V, V _{GS} = ±20V	-	-	±100	nA	
Zero Gate Voltage Drain Current	I _{DSS}	V _{DS} = 60V, V _{GS} = 0V	T _J =25°C	-	-	1	μA
			T _J =100°C	-	-	100	
Gate-Threshold Voltage	V _{GS(th)}	V _{DS} = V _{GS} , I _D = 250μA	1.2	1.7	2.5	V	
Drain-Source on-Resistance ⁴	R _{DS(on)}	V _{GS} = 10V, I _D = 10A	-	25	32	mΩ	
		V _{GS} = 4.5V, I _D = 5A	-	31.5	40		
Forward Transconductance ⁴	g _{fs}	V _{DS} = 5V, I _D = 10A	-	15.5	-	S	
Dynamic Characteristics⁵							
Input Capacitance	C _{iss}	V _{DS} = 30V, V _{GS} = 0V, f = 1MHz	-	1355	-	pF	
Output Capacitance	C _{oss}		-	60	-		
Reverse Transfer Capacitance	C _{rss}		-	49	-		
Gate Resistance	R _G	f = 1MHz	-	1.2	-	Ω	
Switching Characteristics⁵							
Total Gate Charge	Q _g	V _{GS} = 10V, V _{DD} = 30V, I _D = 10A	-	22	-	nC	
Gate-Source Charge	Q _{gs}		-	4.2	-		
Gate-Drain Charge	Q _{gd}		-	6.9	-		
Turn-on Delay Time	t _{d(on)}	V _{GS} = 10V, V _{DD} = 30V, R _G = 3Ω, I _D = 10A	-	6.4	-	ns	
Rise Time	t _r		-	15.3	-		
Turn-off Delay Time	t _{d(off)}		-	25	-		
Fall Time	t _f		-	7.6	-		
Body Diode Reverse Recovery Time	t _{rr}	I _F = 10A, dI _F /dt = 100A/μs	-	26	-	ns	
Body Diode Reverse Recovery Charge	Q _{rr}		-	45	-	nC	
Drain-Source Body Diode Characteristics							
Diode Forward Voltage ⁴	V _{SD}	I _S = 10A, V _{GS} = 0V	-	-	1.2	V	
Continuous Source Current	I _S	T _C = 25°C	-	-	20	A	

Notes:

1. Repetitive rating, pulse width limited by junction temperature T_{J(MAX)} = 150°C
2. The EAS data shows Max. rating . The test condition is V_{DD} = 25V, V_{GS} = 10V, L = 0.4mH, I_{AS} = 14A
3. The data tested by surface mounted on a 1 inch² FR-4 board with 2OZ copper, The value in any given application depends on the user's specific board design.
4. The data tested by pulsed , pulse width ≤ 300us , duty cycle ≤ 2%.
5. This value is guaranteed by design hence it is not included in the production test.

Typical Characteristics

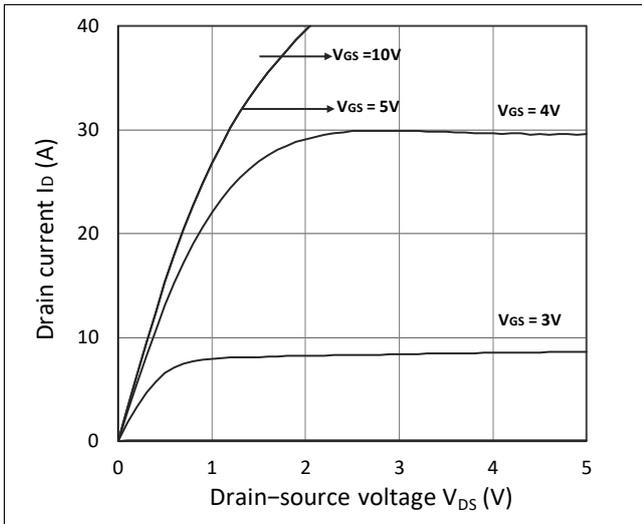


Figure 1. Output Characteristics

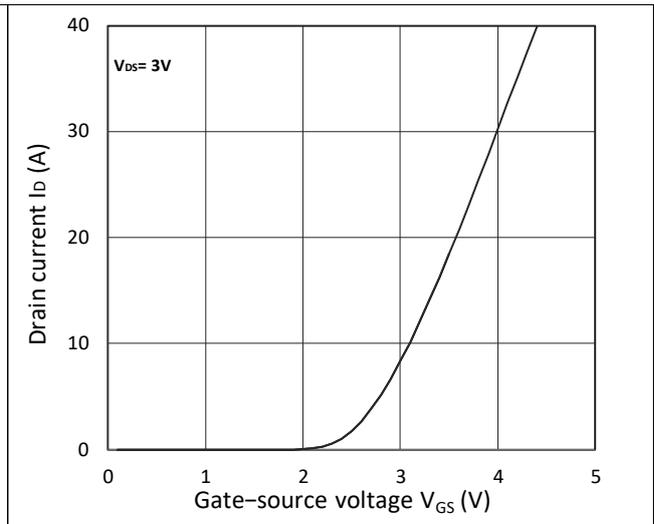


Figure 2. Transfer Characteristics

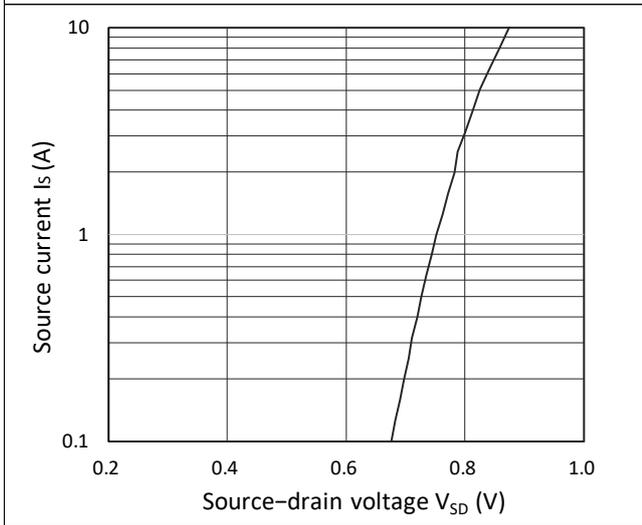


Figure 3. Forward Characteristics of Reverse

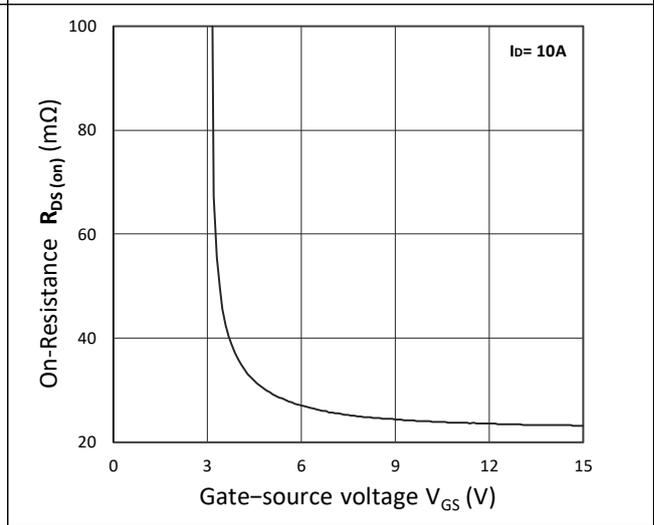


Figure 4. $R_{DS(ON)}$ vs. V_{GS}

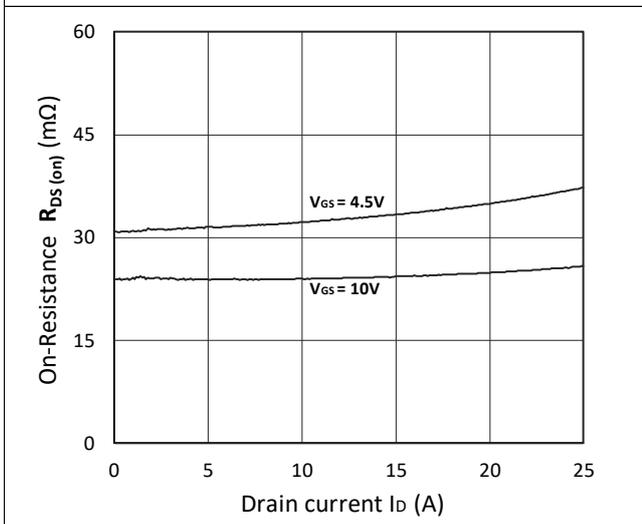


Figure 5. $R_{DS(ON)}$ vs. I_D

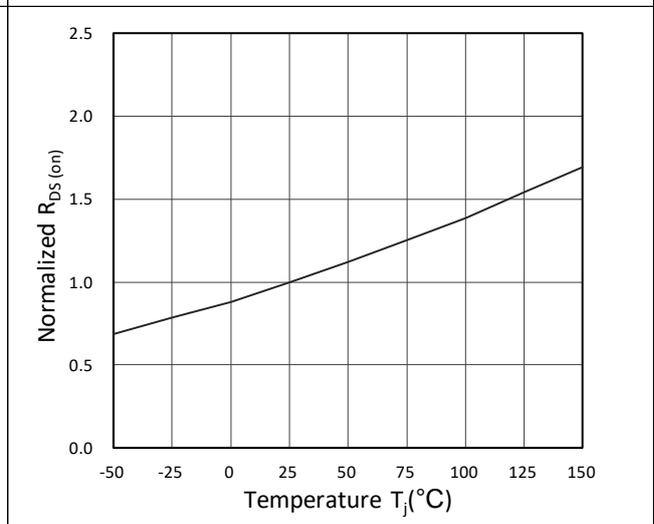


Figure 6. Normalized $R_{DS(on)}$ vs. Temperature

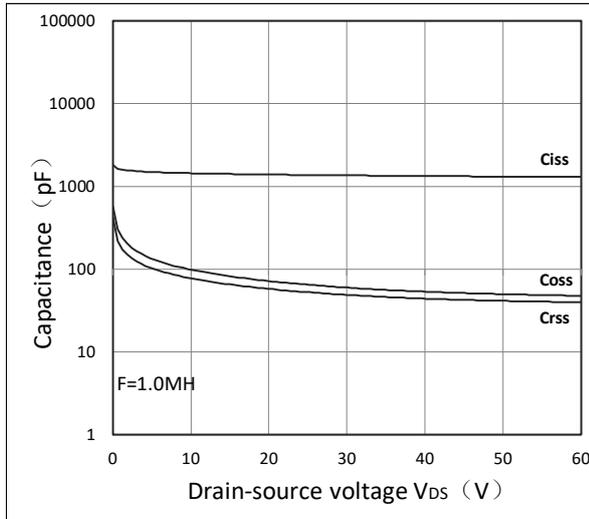


Figure 7. Capacitance Characteristics

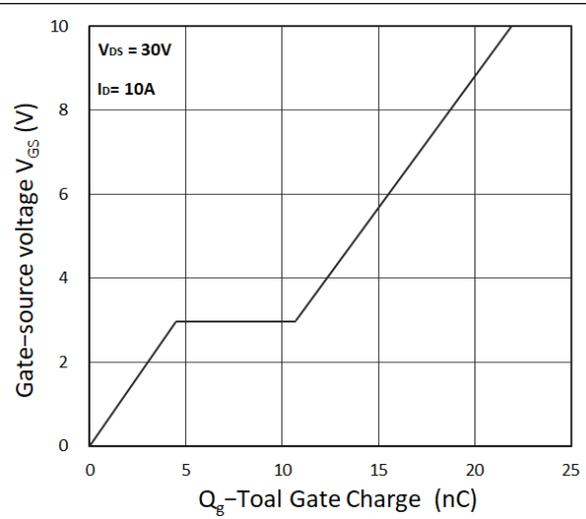


Figure 8. Gate Charge Characteristics

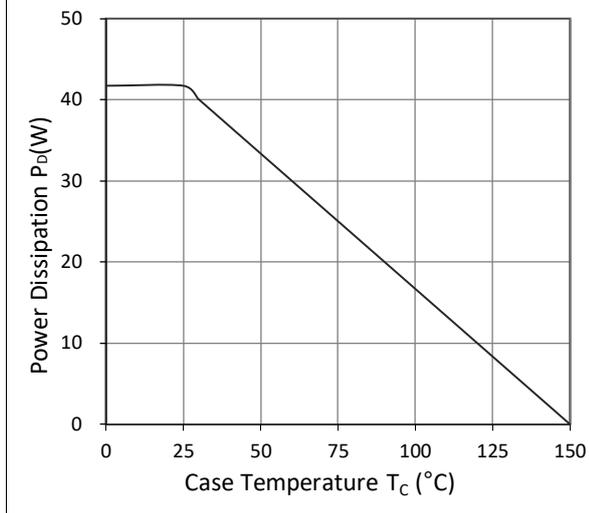


Figure 9. Power Dissipation

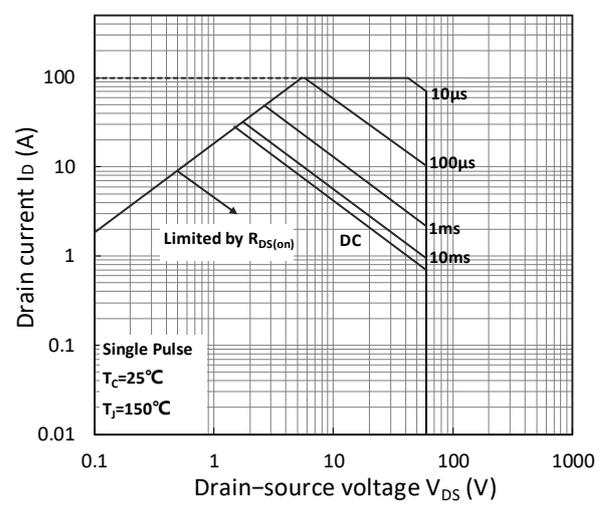


Figure 10. Safe Operating Area

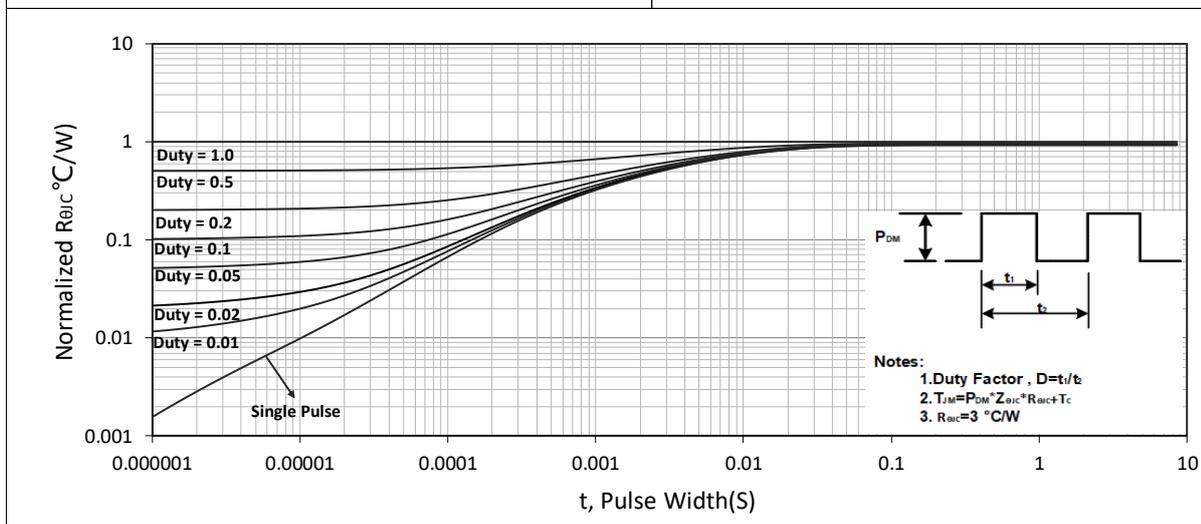


Figure 11. Normalized Maximum Transient Thermal Impedance

Package Mechanical Data TO 251

