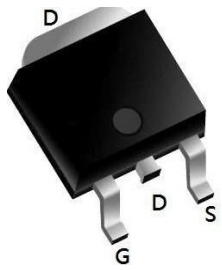
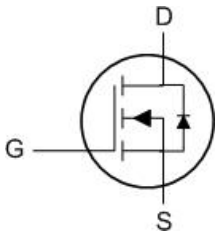
★ 100% EAS Guaranteed
★ Green Device Available
★ Super Low Gate Charge
★ Excellent CdV/dt effect decline
★ Advanced high cell density Trench technology

Product Summary

BVDSS	RDSON	ID
20V	12mΩ	30A

TO252 Pin Configuration





Description

The ZX30N02 is the high cell density trenched N-ch MOSFETs, which provide excellent RDSON and gate charge for most of the synchronous buck converter applications.

The ZX30N02 meet the RoHS and Green Product requirement, 100% EAS guaranteed with full function reliability approved.

Absolute Maximum Ratings

Symbol	Parameter	Rating	Units
V_{DS}	Drain-Source Voltage	20	V
V_{GS}	Gate-Source Voltage	±20	V
I_D@T_C=25℃	Continuous Drain Current, V_{GS} @ 10V[1]	30	A
I_D@T_C=100℃	Continuous Drain Current, V_{GS} @ 10V[1]	18	A
I_D@T_A=25℃	Continuous Drain Current, V_{GS} @ 10V[1]	8.2	A
I_D@T_A=70℃	Continuous Drain Current, V_{GS} @ 10V[1]	6.5	A
I_{DM}	Pulsed Drain Current[2]	60	A
EAS	Single Pulse Avalanche Energy[3]	12.1	mJ
I_{AS}	Avalanche Current	11	A
P_D@T_C=25℃	Total Power Dissipation[4]	5	W
P_D@T_A=25℃	Total Power Dissipation[4]	2	W
T_{STG}	Storage Temperature Range	-55 to 150	℃
T_J	Operating Junction Temperature Range	-55 to 150	℃

Thermal Data

Symbol	Parameter	Typ.	Max.	Unit
$R_{\theta JA}$	Thermal Resistance Junction-ambient (Steady State)[1]	---	100	℃/W
$R_{\theta JC}$	Thermal Resistance Junction-Case[1]	---	---	℃/W

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

Parameter	Symbol	Test Condition	Min.	Typ.	Max.	Unit
Static Characteristics						
Drain-Source Breakdown Voltage	BV_{DSS}	V_{GS} = 0 V, I_D = 250μA	20	-	-	V
Gate Leakage Current	I_{GSS}	V_{GS} = ±12V, V_{DS} = 0 V	-	-	±100	nA
Drain Cut-off Current	I_{DSS}	V_{DS} = 20V, V_{GS} = 0 V	-	-	1	μA
Gate Threshold Voltage	$V_{GS(th)}$	V_{GS} = V_{DS}, I_D = 250μA	0.45	0.7	1	V
Drain-Source On-State Resistance[3]	$R_{DS(on)}$	V_{GS} = 4.5V, I_D =5A	-	12	20	mΩ
		V_{GS} = 2.5V, I_D = 4.7A	-	17	30	
		V_{GS} = 1.8V, I_D = 4.3A	-	28	50	
Dynamic Characteristics[4]						
Input Capacitance	C_{iss}	V_{GS} = 0V, V_{DS} = 10V, f = 1MHz	-	700	-	pF
Output Capacitance	C_{oss}		-	120	-	
Reverse Transfer Capacitance	C_{rss}		-	105	-	
Switching Characteristics[4]						
Total Gate Charge	Q_g	V_{GS}= 4.5V, V_{DS}= 10V, I_D= 5A	-	10.5	-	nC
Gate-Source Charge	Q_{gs}		-	2	-	
Gate-Drain Charge	Q_{gd}		-	2.5	-	
Turn-On Time	$t_{d(on)}$	V_{GEN}= 5V, V_{DD} = 10V, I_D = 5A,R_G= 3Ω,	-	10	-	ns
Rise Time	t_r		-	20	-	
Turn-Off Time	$t_{d(off)}$		-	32	-	
Fall Time	t_f		-	12	-	
Source-Drain Diode Characteristics						
Body Diode Voltage[3]	V_{SD}	I_S=4A, V_{GS} = 0V	-	-	1.2	V
Continuous Source Current	I_S		-	-	30	A

Notes:

1. Repetitive rating, pulse width limited by junction temperature $T_{J(MAX)}$=150°C.
2. 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.
3. Pulse Test: Pulse width≤300μs, duty cycle≤2%.
4. This value is guaranteed by design hence it is not included in the production test.

Typical Characteristics

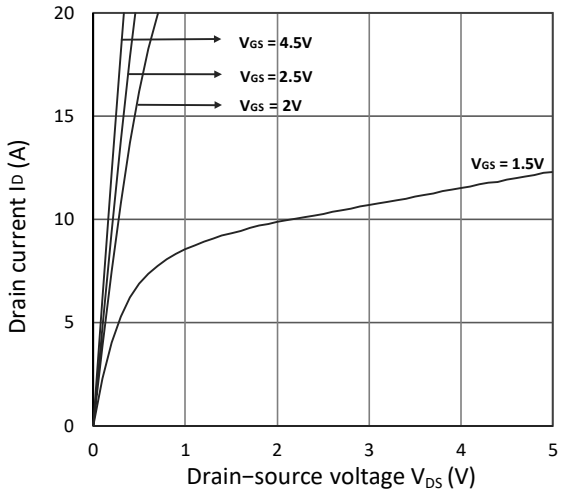


Figure 1. Output Characteristics

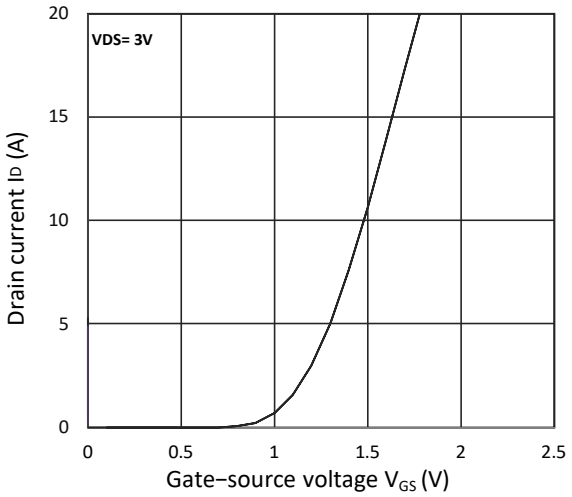


Figure 2. Transfer Characteristics

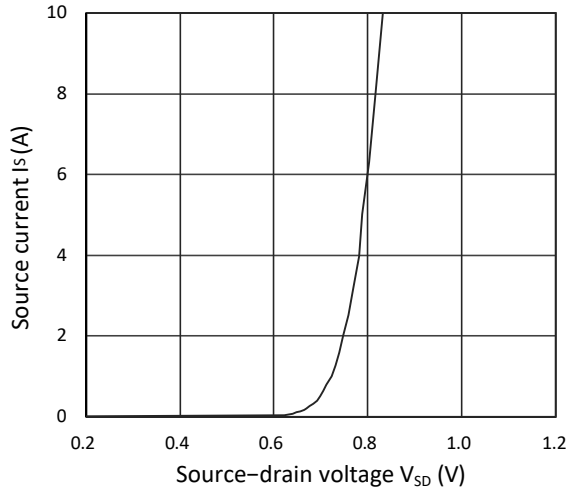


Figure 3. Forward Characteristics of Reverse

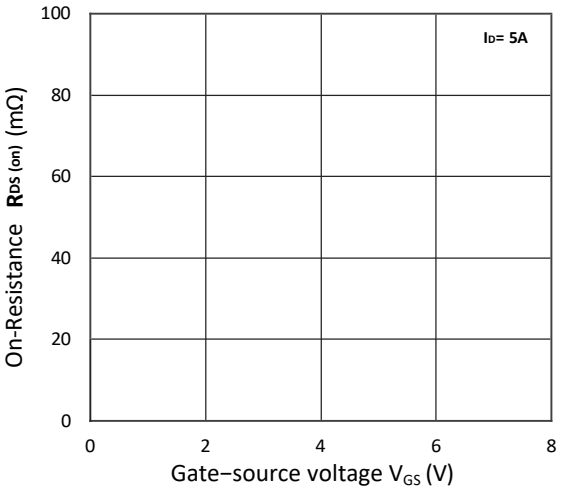


Figure 4. $R_{DS(ON)}$ vs. V_{GS}

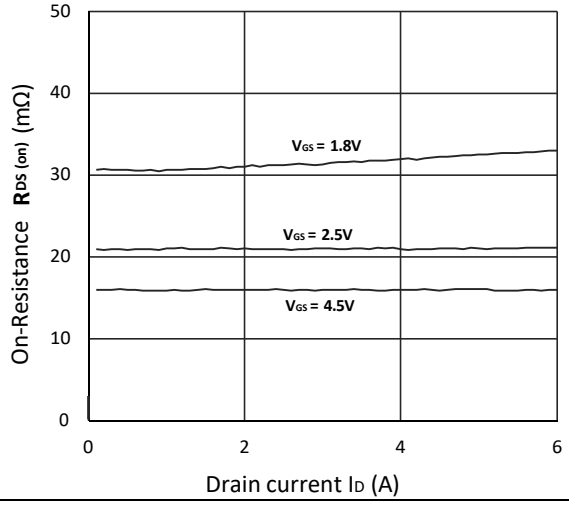


Figure 5. $R_{DS(ON)}$ vs. I_D

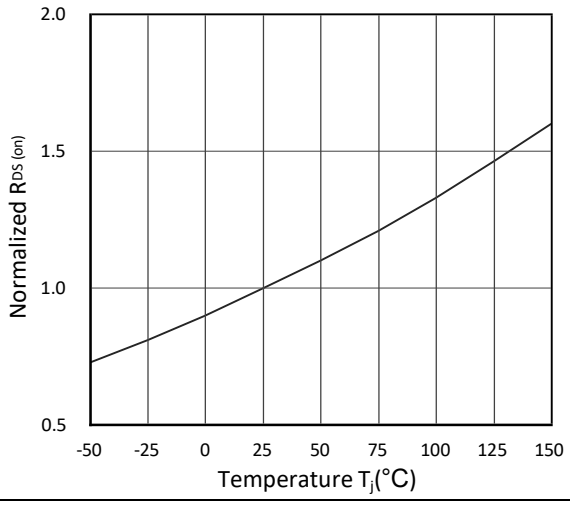


Figure 6. Normalized $R_{DS(on)}$ vs. Temperature

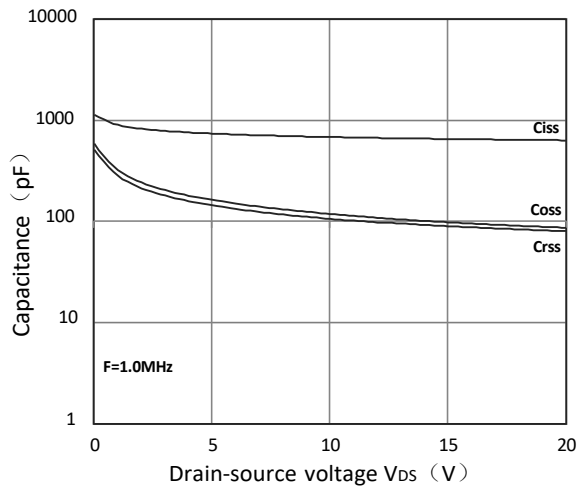


Figure 7. Capacitance Characteristics

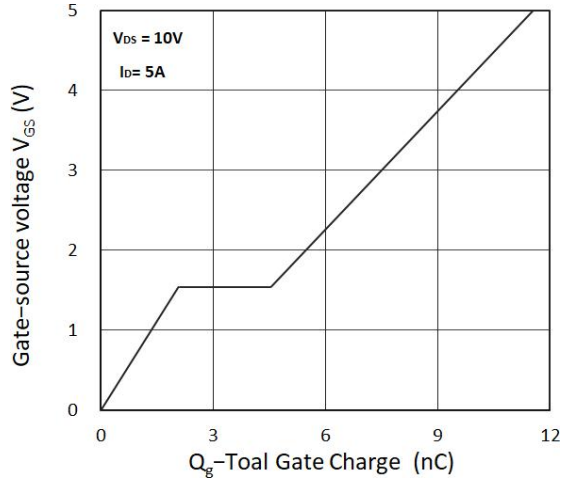
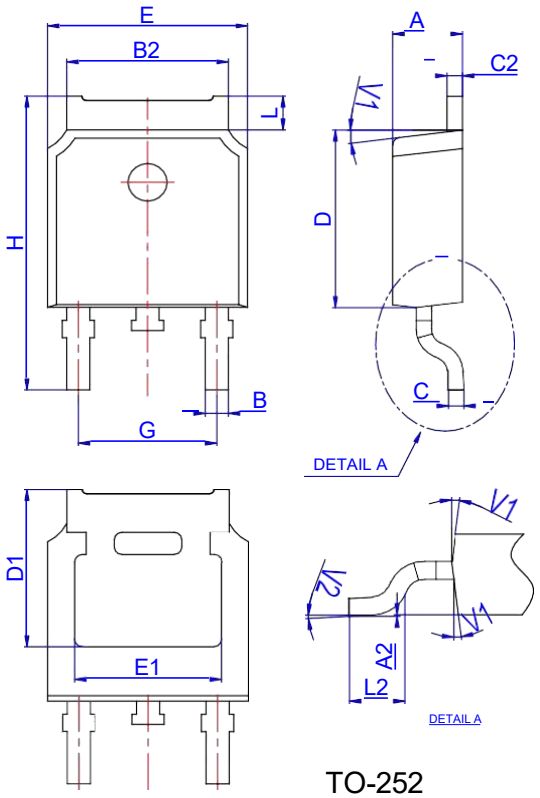


Figure 8. Gate Charge Characteristics

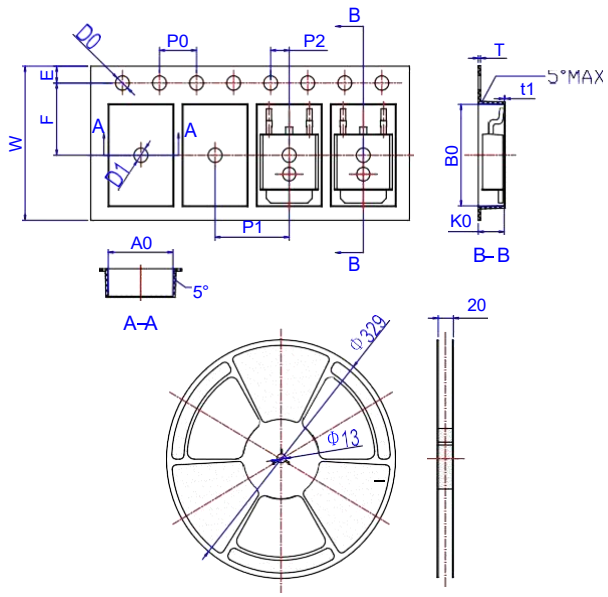
Package Mechanical Data-TO-252-4R



TO-252

Ref.	Dimensions					
	Millimeters			Inches		
	Min.	Typ.	Max.	Min.	Typ.	Max.
A	2.10		2.50	0.083		0.098
A2	0		0.10	0		0.004
B	0.66		0.86	0.026		0.034
B2	5.18		5.48	0.202		0.216
C	0.40		0.60	0.016		0.024
C2	0.44		0.58	0.017		0.023
D	5.90		6.30	0.232		0.248
D1	5.30REF			0.209REF		
E	6.40		6.80	0.252		0.268
E1	4.63			0.182		
G	4.47		4.67	0.176		0.184
H	9.50		10.70	0.374		0.421
L	1.09		1.21	0.043		0.048
L2	1.35		1.65	0.053		0.065
V1		7°			7°	
V2	0°		6°	0°		6°

Reel Specification-TO-252-4R



Ref.	Dimensions					
	Millimeters			Inches		
	Min.	Typ.	Max.	Min.	Typ.	Max.
W	15.90	16.00	16.10	0.626	0.630	0.634
E	1.65	1.75	1.85	0.065	0.069	0.073
F	7.40	7.50	7.60	0.291	0.295	0.299
D0	1.40	1.50	1.60	0.055	0.059	0.063
D1	1.40	1.50	1.60	0.055	0.059	0.063
P0	3.90	4.00	4.10	0.154	0.157	0.161
P1	7.90	8.00	8.10	0.311	0.315	0.319
P2	1.90	2.00	2.10	0.075	0.079	0.083
A0	6.85	6.90	7.00	0.270	0.271	0.276
B0	10.45	10.50	10.60	0.411	0.413	0.417
K0	2.68	2.78	2.88	0.105	0.109	0.113
T	0.24		0.27	0.009		0.011
t1	0.10			0.004		
10P0	39.80	40.00	40.20	1.567	1.575	1.583