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

Product Summary

Green

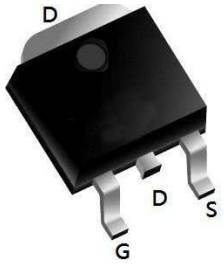
BVDSS	RDSON	ID
-100V	46mΩ	-30A

Description

The XR30P10 is the high cell density trenched P-ch MOSFETs, which provide excellent RDSON and gate charge for most of the synchronous buck converter applications.

The XR30P10 meet the RoHS and Green Product requirement 100% EAS guaranteed with full function reliability approved.

TO252-3L Pin Configuration



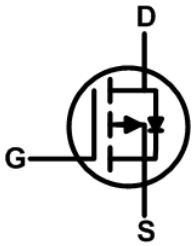


Table 1. Absolute Maximum Ratings (T_A=25℃ unless otherwise noted)

Symbol	Parameter	Limit	Unit
V_{DS}	Drain-Source Voltage (V_{GS}=0V)	-100	V
V_{GS}	Gate-Source Voltage (V_{DS}=0V)	±20	V
I_D	Drain Current-Continuous(T_C=25℃)	-30	A
	Drain Current-Continuous(T_C=100℃)	-21	A
$I_{DM\ (pluse)}$	Drain Current-Continuous@ Current-Pulsed (Note 1)	-120	A
P_D	Maximum Power Dissipation(T_C=25℃)	107	W
	Maximum Power Dissipation(T_C=100℃)	53	W
E_{AS}	Avalanche energy (Note 2)	361	mJ
T_J, T_{STG}	Operating Junction and Storage Temperature Range	-55 To 175	℃

Table 2. Thermal Characteristic

Symbol	Parameter	Typ	Max	Unit
$R_{\theta JC}$	Thermal Resistance, Junction-to-Case		1.4	℃/W

Table 3. Electrical Characteristics (T_J=25℃ unless otherwise noted)

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
On/Off States						
BV_{DSS}	Drain-Source Breakdown Voltage	V_{GS}=0V I_D=-250μA	-100	-127		V
I_{DSS}	Zero Gate Voltage Drain Current	V_{DS}=-100V, V_{GS}=0V			-1	μA
I_{GSS}	Gate-Body Leakage Current	V_{GS}=±20V, V_{DS}=0V			±100	nA
$V_{GS(th)}$	Gate Threshold Voltage	V_{DS}=V_{GS}, I_D=-250μA	-1	-1.8	-2.5	V
g_{FS}	Forward Transconductance	V_{DS}=-5V, I_D=-15A		50		S
$R_{DS(ON)}$	Drain-Source On-State Resistance	V_{GS}=-10V, I_D=-15A		46	57.5	mΩ
		V_{GS}=-4.5V, I_D=-10A		48	63	mΩ
Dynamic Characteristics						
C_{iss}	Input Capacitance	V_{DS}=-25V, V_{GS}=0V, f=1.0MHz		8056		pF
C_{oss}	Output Capacitance			195		pF
C_{rss}	Reverse Transfer Capacitance			70		pF
Switching Parameters						
$t_{d(on)}$	Turn-on Delay Time	V_{GS}=-10V, V_{DS}=-50V, R_L=3.3Ω, R_{GEN}=9.1Ω		13		nS
t_r	Turn-on Rise Time			64		nS
$t_{d(off)}$	Turn-Off Delay Time			36		nS
t_f	Turn-Off Fall Time			52		nS
Q_g	Total Gate Charge	V_{GS}=-10V, V_{DS}=-50V, I_D=-10A		147		nC
Q_{gs}	Gate-Source Charge			17		nC
Q_{gd}	Gate-Drain Charge			31		nC
Source-Drain Diode Characteristics						
I_{SD}	Source-Drain Current (Body Diode)				-30	A
V_{SD}	Forward on Voltage (Note 3)	V_{GS}=0V, I_S=-15A			-1.2	V
t_{rr}	Reverse Recovery Time	I_F=-15A, di/dt=100A/μs		72		ns
Q_{rr}	Reverse Recovery Charge	I_F=-15A, di/dt=100A/μs		120		nC

Notes 1.Repetitive Rating: Pulse width limited by maximum junction temperature.
Notes 2.E_{AS} condition: T_J=25℃,V_{DD}=50V,V_G=-10V, Rg=25Ω, L=0.5mH.
Notes 3.Repetitive Rating: Pulse width limited by maximum junction temperature.

Typical Electrical And Thermal Characteristics (Curves)

Figure 1. Output Characteristics

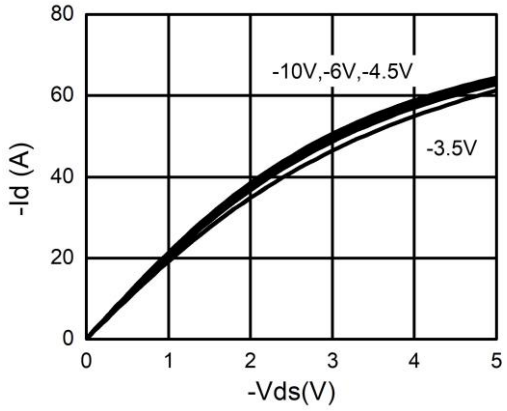


Figure 2. Transfer Characteristics

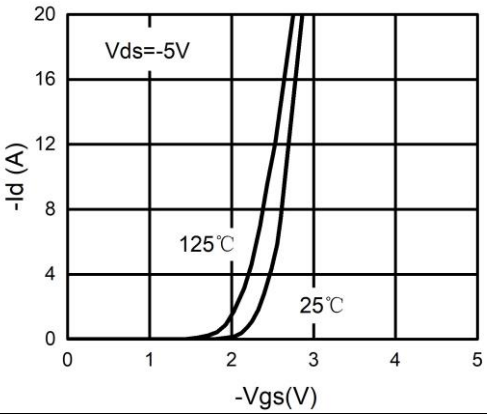


Figure 3. Power Dissipation

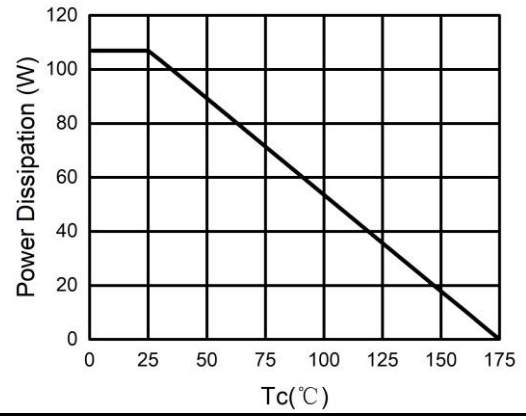


Figure 4. Drain Current

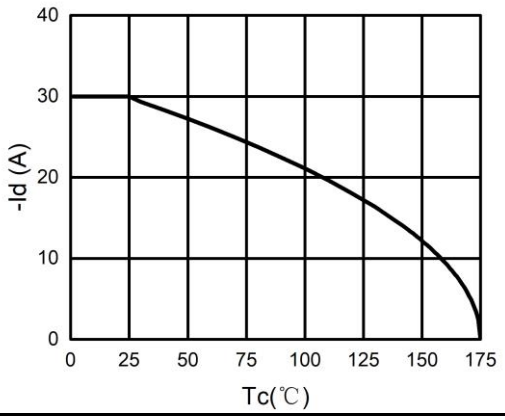


Figure 5. BV_{DSS} vs Junction Temperature

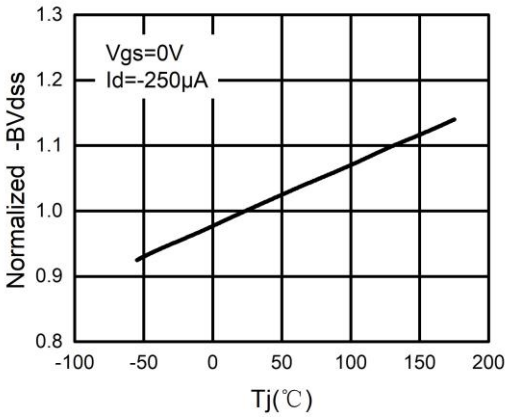


Figure 6. $R_{DS(ON)}$ vs Junction Temperature

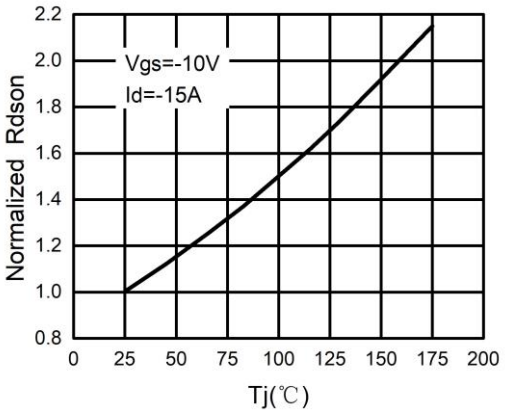


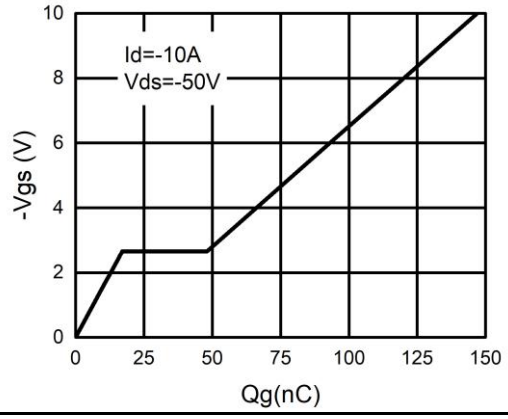
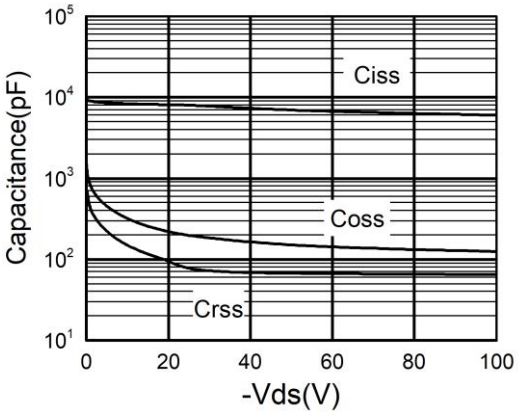
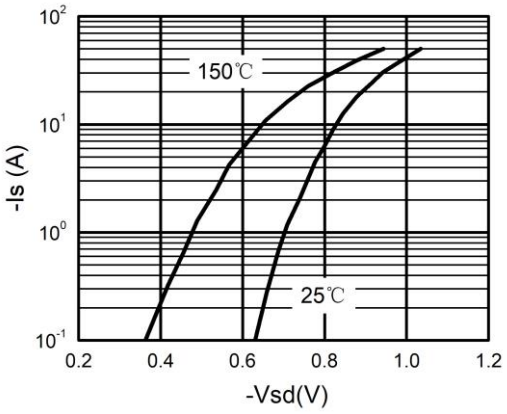
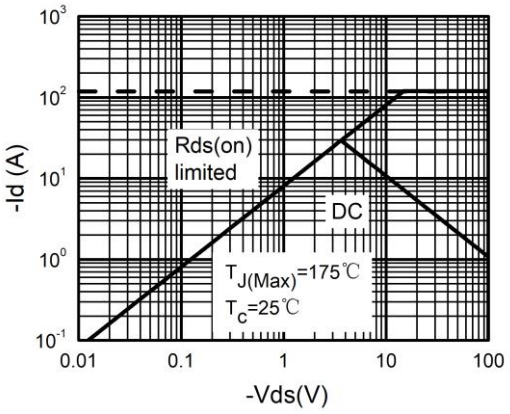
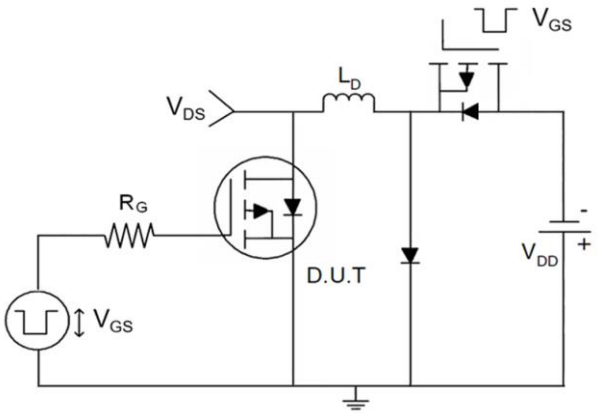
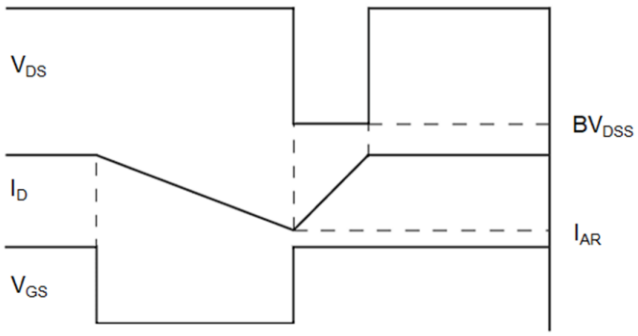
Figure 7. Gate Charge Waveforms	Figure 8. Capacitance
	

Figure 9. Body-Diode Characteristics	Figure 10. Maximum Safe Operating Area
	

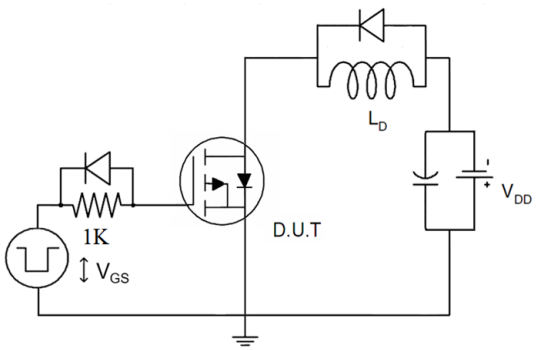
Test Circuit

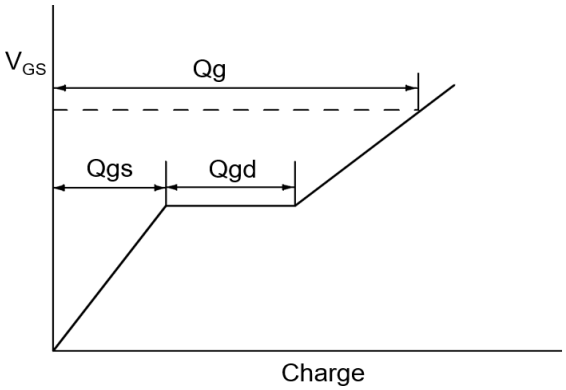
1) E_{AS} Test Circuits



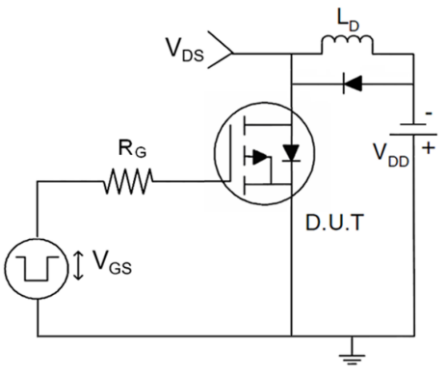


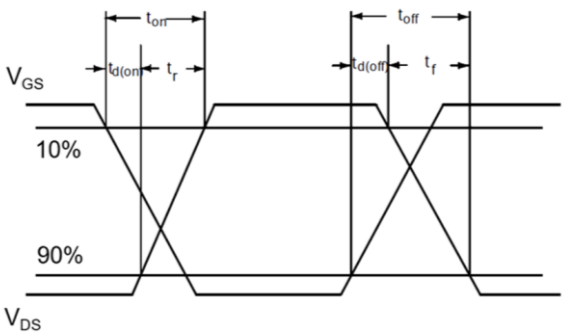
2) Gate Charge Test Circuit



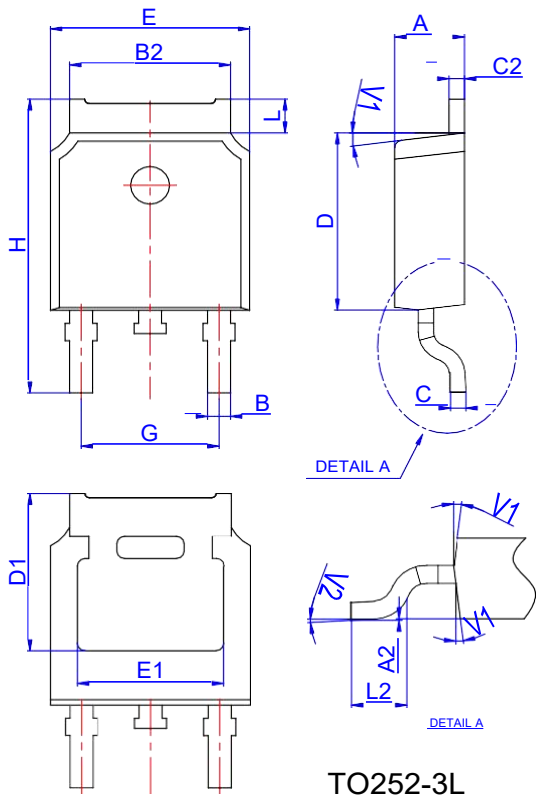


3) Switch Time Test Circuit





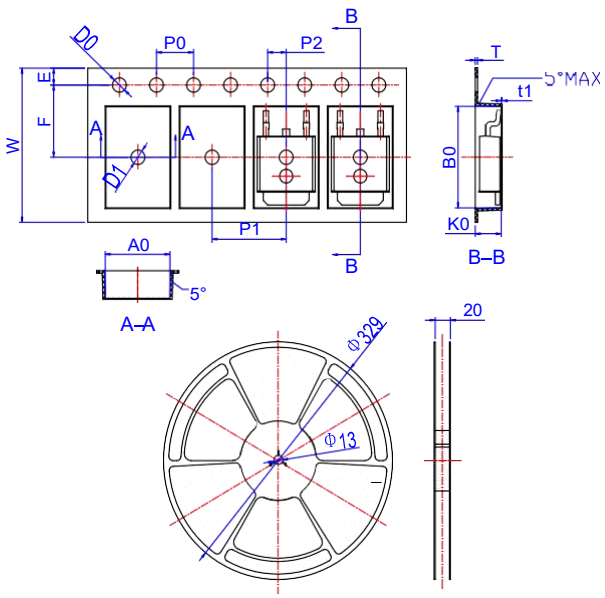
Package Mechanical Data-TO252-3L



TO252-3L

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 Spectification-TO252-3L



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