

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

Product Summary



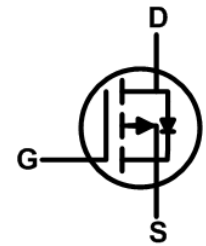
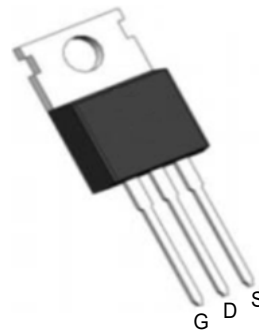
BVDSS	RDSON	ID
-100V	47 mΩ	-30A

Description

The XR30P10HT 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 XR30P10HT meet the RoHS and Green Product requirement 100% EAS guaranteed with full function reliability approved.

TO220 Pin Configuration



Absolute Maximum Ratings

Symbol	Parameter	Rating	Units
V_{DS}	Drain-Source Voltage	-100	V
V_{GS}	Gate-Source Voltage	± 20	V
$I_D@T_C=25^\circ C$	Continuous Drain Current, $V_{GS} @ 10V^{1,6}$	-30	A
$I_D@T_C=100^\circ C$	Continuous Drain Current, $V_{GS} @ 10V^{1,6}$	-14	A
I_{DM}	Pulsed Drain Current ²	-120	A
EAS	Single Pulse Avalanche Energy ³	361	mJ
I_{AS}	Avalanche Current	---	A
$P_D@T_C=25^\circ C$	Total Power Dissipation ⁴	53	W
T_{STG}	Storage Temperature Range	-55 to 150	$^\circ C$
T_J	Operating Junction Temperature Range	-55 to 150	$^\circ C$

Thermal Data

Symbol	Parameter	Typ.	Max.	Unit
$R_{\theta JA}$	Thermal Resistance Junction-Ambient ¹	---	---	$^\circ C/W$
$R_{\theta JC}$	Thermal Resistance Junction-Case ¹	---	1.4	$^\circ C/W$

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

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
BV _{DSS}	Drain-Source Breakdown Voltage	V _{GS} =0V, I _D =-250uA	-100	---	---	V
ΔBV _{DSS} /ΔT _J	BV _{DSS} Temperature Coefficient	Reference to 25°C, I _D =1mA	---	---	---	V/ °C
R _{DS(ON)}	Static Drain-Source On-Resistance ²	V _{GS} =-10V, I _D =-15A	---	47	70	mΩ
		V _{GS} =-4.5V, I _D =-10A	---	---	---	
		V _{GS} =-2.5V, I _D =-5A	---	---	---	
V _{GS(th)}	Gate Threshold Voltage	V _{GS} =V _{DS} , I _D =-250uA	-2	-2.8	-4	V
ΔV _{GS(th)}	V _{GS(th)} Temperature Coefficient		---	---	---	mV/ °C
I _{DSS}	Drain-Source Leakage Current	V _{DS} =-100V, V _{GS} =0V, T _J =25°C	---	---	-1	uA
		V _{DS} =-100V, V _{GS} =0V, T _J =100°C	---	---	-100	
I _{GSS}	Gate-Source Leakage Current	V _{GS} =±20V, V _{DS} =0V	---	---	±100	nA
g _{fs}	Forward Transconductance	V _{DS} =-5V, I _D =-15A	---	50	---	S
Q _g	Total Gate Charge	V _{DS} =-50V, V _{GS} =-10V, I _D =-10A	---	74	---	nC
Q _{gs}	Gate-Source Charge		---	9	---	
Q _{gd}	Gate-Drain Charge		---	16	---	
T _{d(on)}	Turn-On Delay Time	V _{DD} =-50V, V _{GS} =-10V, R _G =9.1Ω	---	7	---	ns
T _r	Rise Time		---	33	---	
T _{d(off)}	Turn-Off Delay Time		---	19	---	
T _f	Fall Time		---	28	---	
C _{iss}	Input Capacitance	V _{DS} =-25V, V _{GS} =0V, f=1MHz	---	4020	---	pF
C _{oss}	Output Capacitance		---	101	---	
C _{rss}	Reverse Transfer Capacitance		---	36	---	

Diode Characteristics

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
I _S	Continuous Source Current ^{1,4}	V _G =V _D =0V, Force Current	---	---	-30	A
I _{SM}	Pulsed Source Current ^{2,4}		---	---	-120	A
V _{SD}	Diode Forward Voltage ²	V _{GS} =0V, I _S =-1A, T _J =25°C	---	---	-1.2	V
t _{rr}	Reverse Recovery Time	I _F =-15A, di/dt=100A/μs	---	37	---	ns
Q _{rr}	Reverse Recovery Charge	μs, T _J =25°C	---	60	---	nC

Note :

1 The data is tested by surface mounted on a 1 inch² FR-4 board with 2OZ copper.

2 The data is tested by pulsed pulse width ≤ 300us duty cycle ≤ 2%

3 The EAS data shows Max. Rating at the test condition as V_{RM} × D × V_{DD}=50V, V_G=-10V, R_G=25Ω, L=0.5mH.

4 The power dissipation is limited by 150°C junction temperature

5 The data is theoretically the same as I_{DM} and I_{OMA} in real applications it should be limited by total power dissipation.

Typical Electrical And Thermal Characteristics (Curves)

Figure 1. Output Characteristics

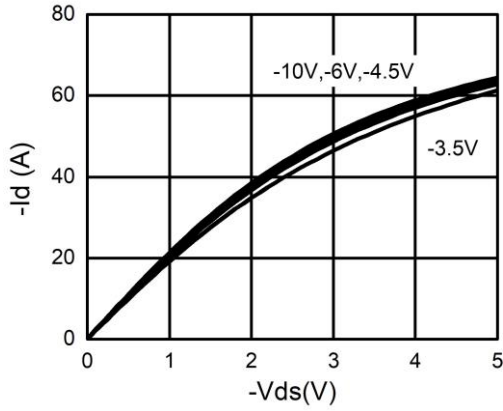


Figure 2. Transfer Characteristics

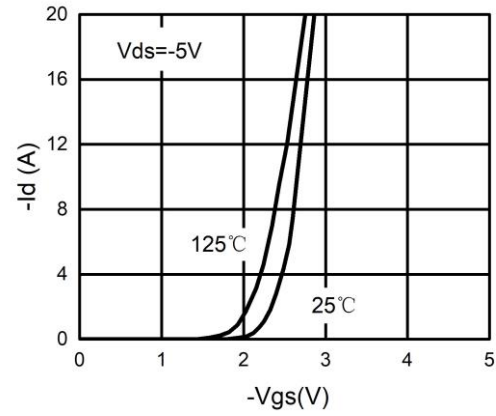


Figure 3. Power Dissipation

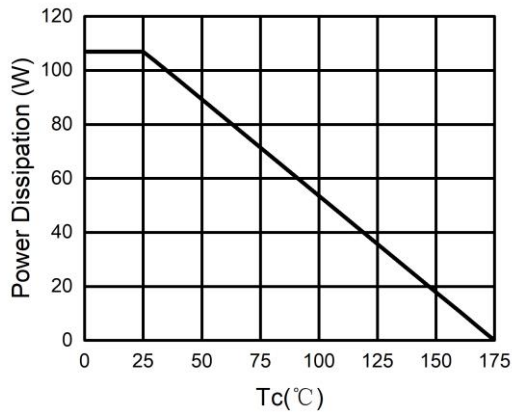


Figure 4. Drain Current

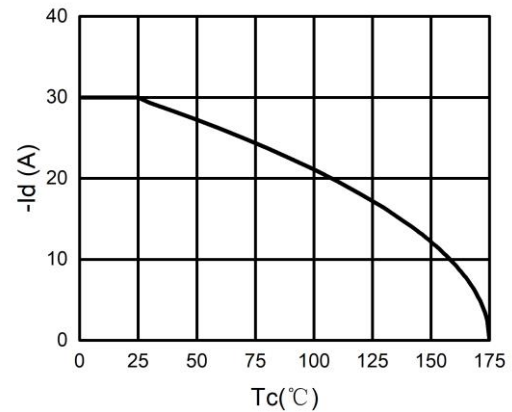


Figure 5. BV_{DSS} vs Junction Temperature

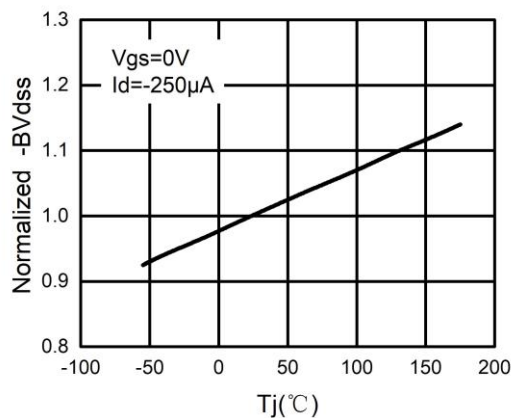


Figure 6. $R_{DS(ON)}$ vs Junction Temperature

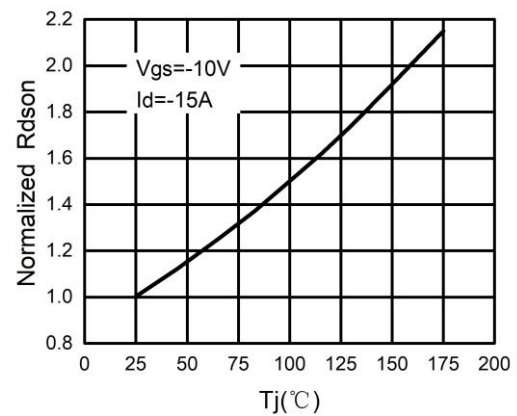


Figure 7. Gate Charge Waveforms

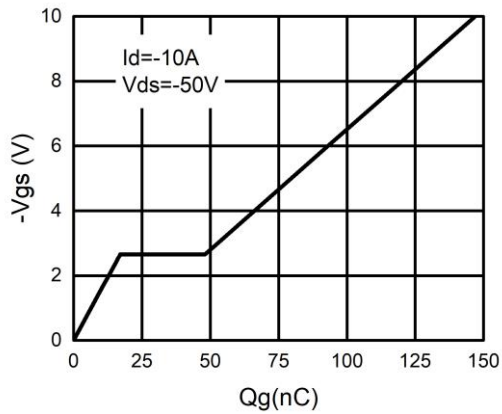


Figure 8. Capacitance

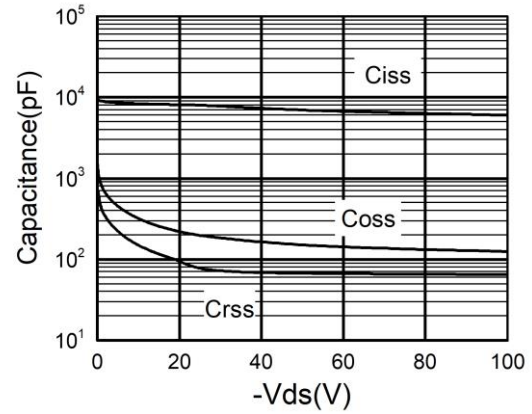


Figure 9. Body-Diode Characteristics

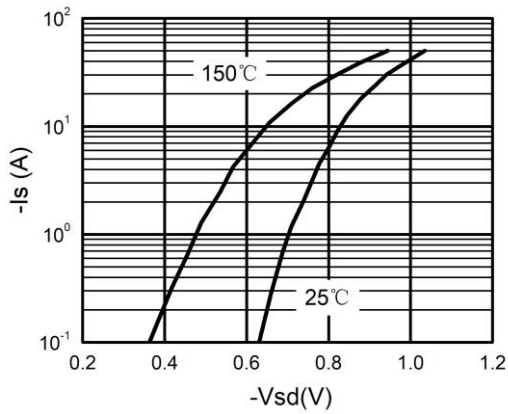
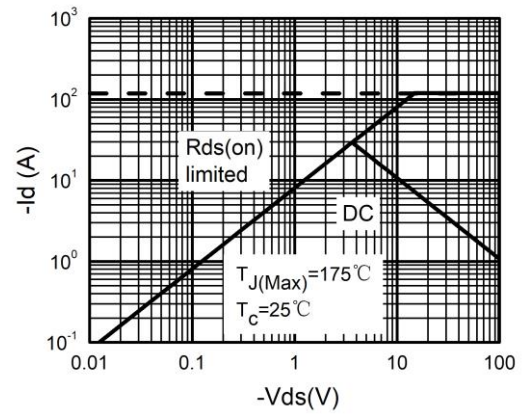


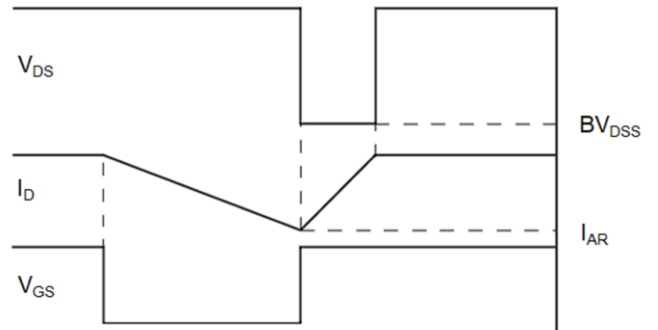
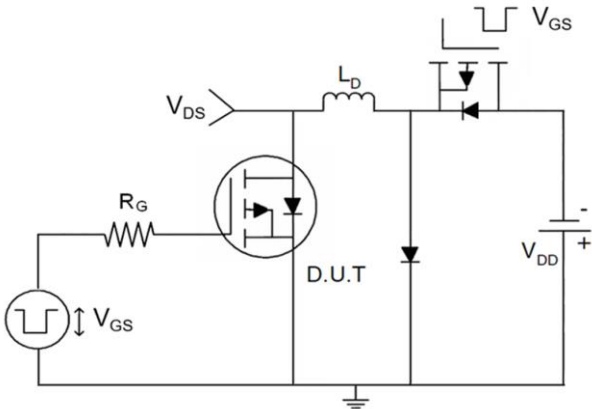
Figure 10. Maximum Safe Operating Area



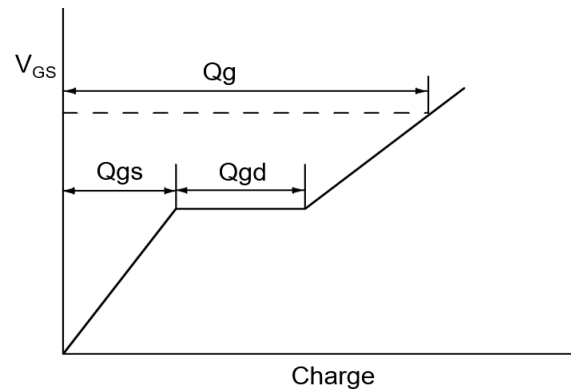
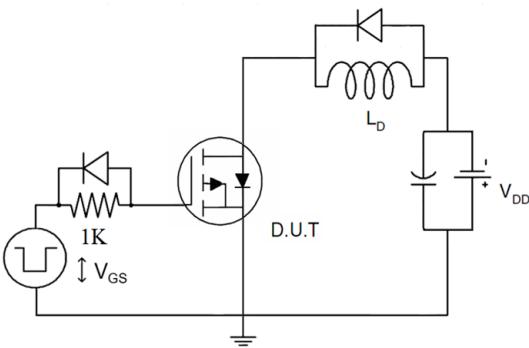
Test Circuit

P-Ch 100V Fast Switching MOSFETs

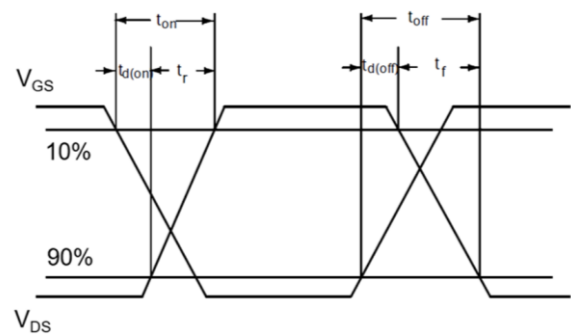
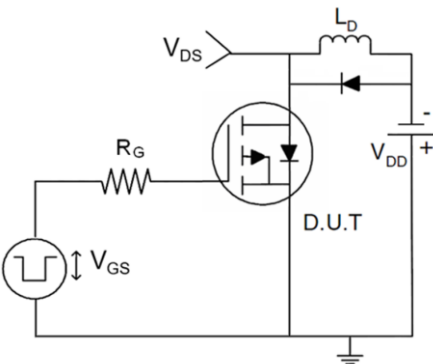
1) E_{AS} Test Circuits



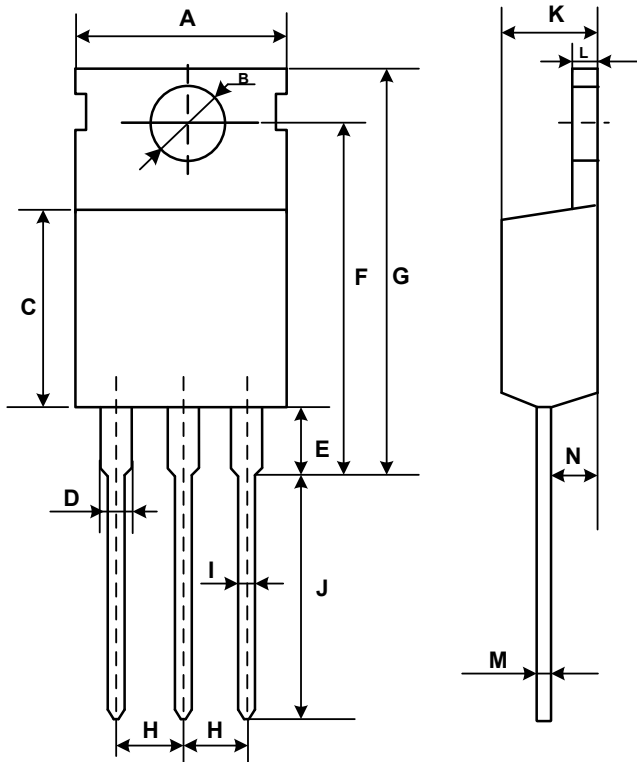
2) Gate Charge Test Circuit



3) Switch Time Test Circuit



Mechanical Dimensions for TO220



COMMON DIMENSIONS

SYMBOL	MM	
	MIN	MAX
A	9.70	10.30
B	3.40	3.80
C	8.80	9.40
D	1.17	1.47
E	2.60	3.50
F	15.10	16.70
G	19.55MAX	
H	2.54REF	
I	0.70	0.95
J	9.35	11.00
K	4.30	4.77
L	1.20	1.45
M	0.40	0.65
N	2.20	2.60