

P-Ch 20V Fast Switching MOSFETs

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

Product Summary



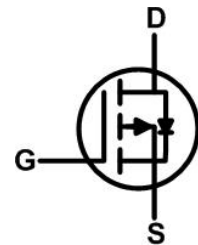
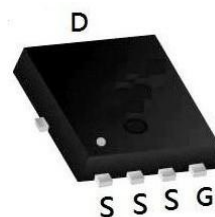
BVDSS	RDSON	ID
-20V	6.6mΩ	-55A

Description

The XR55P02D 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 XR55P02D meet the RoHS and Green Product requirement 100% EAS guaranteed with full function reliability approved.

PDFN3333-8L Pin Configuration



Absolute Maximum Ratings ($T_C=25^{\circ}\text{C}$ unless otherwise specified)

Symbol	Parameter		Max.	Units
V_{DSS}	Drain-Source Voltage		-20	V
V_{GSS}	Gate-Source Voltage		± 12	V
I_D	Continuous Drain Current	$T_C = 25^{\circ}\text{C}$	55	A
		$T_C = 100^{\circ}\text{C}$	-39	
I_{DM}	Pulsed Drain Current ^{note1}		-240	A
P_D	Power Dissipation	$T_C = 25^{\circ}\text{C}$	70	W
$R_{\theta JC}$	Thermal Resistance, Junction to Ambient		2.1	$^{\circ}\text{C/W}$
T_J, T_{STG}	Operating and Storage Temperature Range		-55 to +175	$^{\circ}\text{C}$

Electrical Characteristics ($T_J=25^\circ\text{C}$ unless otherwise specified)

Symbol	Parameter	Test Condition	Min.	Typ.	Max.	Units
Off Characteristic						
V _{(BR)DSS}	Drain-Source Breakdown Voltage	V _{GS} =0V, I _D = -250μA	-20	-	-	V
I _{DSS}	Zero Gate Voltage Drain Current	V _{DS} = -20V, V _{GS} = 0V,	-	-	-1	μA
I _{GSS}	Gate to Body Leakage Current	V _{DS} =0V, V _{GS} = ±12V	-	-	±100	nA
On Characteristics						
V _{GS(th)}	Gate Threshold Voltage	V _{DS} = V _{GS} , I _D = -250μA	-0.4	-0.85	-1.2	V
R _{DS(on)}	Static Drain-Source on-Resistance note3	V _{GS} =-4.5V, I _D =-15A	-	6.6	8.5	mΩ
		V _{GS} =-2.5V, I _D =-12A	-	8	12	
Dynamic Characteristics						
C _{iss}	Input Capacitance	V _{DS} =-10V, V _{GS} =0V, f = 1.0MHz	-	4590	-	pF
C _{oss}	Output Capacitance		-	505	-	pF
C _{rss}	Reverse Transfer Capacitance		-	440	-	pF
Q _g	Total Gate Charge	V _{DS} =-10V, I _D =-15A, V _{GS} =-4.5V	-	46	-	nC
Q _{gs}	Gate-Source Charge		-	7.3	-	nC
Q _{gd}	Gate-Drain(“Miller”) Charge		-	10	-	nC
Switching Characteristics						
t _{d(on)}	Turn-on Delay Time	V _{DD} =-10V, I _D =-14A, R _{GEN} =2.7Ω, V _{GS} =-10V	-	8	-	ns
t _r	Turn-on Rise Time		-	59	-	ns
t _{d(off)}	Turn-off Delay Time		-	111	-	ns
t _f	Turn-off Fall Time		-	43	-	ns
Drain-Source Diode Characteristics and Maximum Ratings						
I _S	Maximum Continuous Drain to Source Diode Forward Current		-	-	-55	A
I _{SM}	Maximum Pulsed Drain to Source Diode Forward Current		-	-	-240	A
V _{SD}	Drain to Source Diode Forward Voltage	V _{GS} = 0V, I _S =-20A	-	-	-1.2	V
t _{rr}	Reverse Recovery Time	T _J =25℃, I _{SD} =-15A,	-	18	-	ns
Q _{rr}	Reverse Recovery Charge	V _{GS} =0V di/dt=-100A/μs	-	7.7	-	nC

Notes:1. Repetitive Rating: Pulse Width Limited by Maximum Junction Temperature

2. EAS condition: $T_J=25^\circ\text{C}, V_{DD}=-10V, V_G=-10V, R_G=5.9\Omega, L=0.5mh, I_{AS}=-13.2A$ 3. Pulse Test: Pulse Width $\leq 300\mu s$, Duty Cycle $\leq 0.5\%$

Typical Performance Characteristics

Figure 1: Output Characteristics

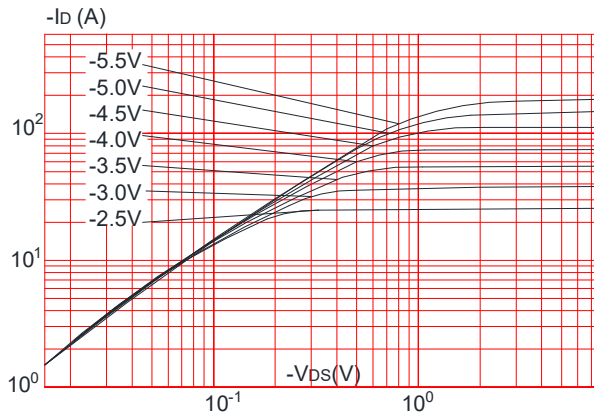


Figure 2: Typical Transfer Characteristics

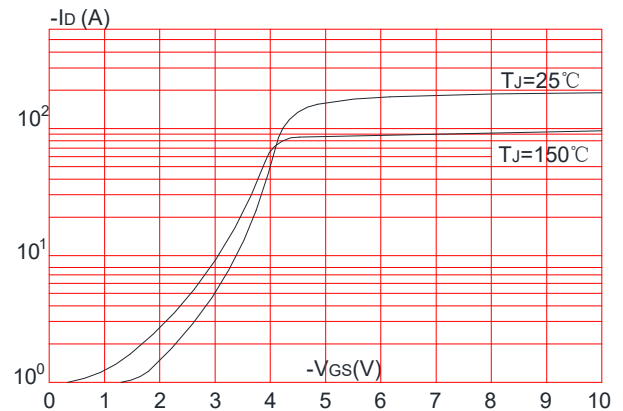


Figure 3: On-resistance vs. Drain Current

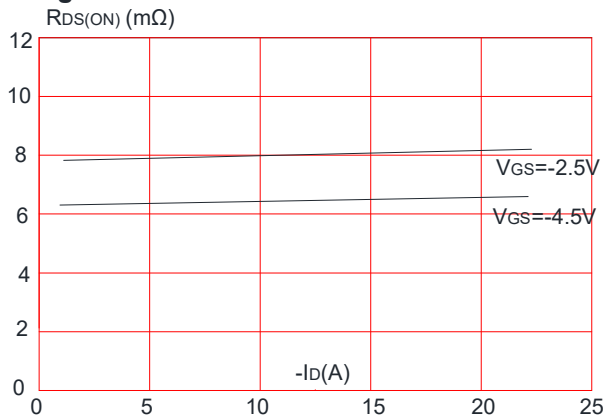


Figure 4: Body Diode Characteristics

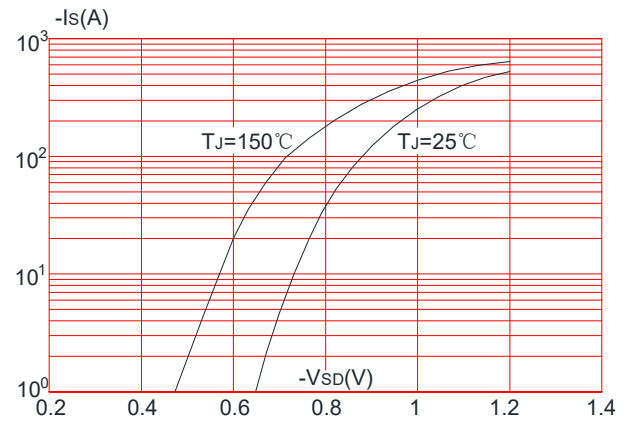


Figure 5: Gate Charge Characteristics

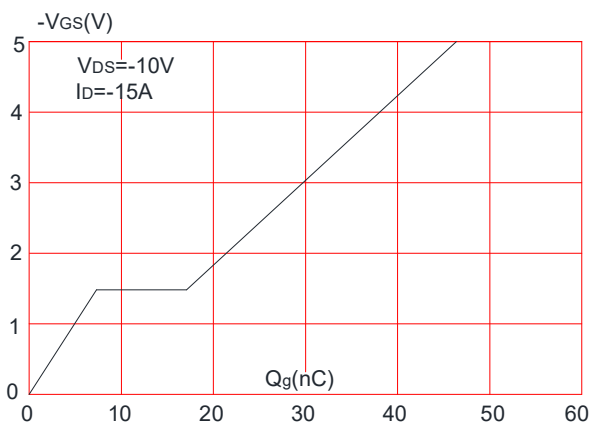


Figure 6: Capacitance Characteristics

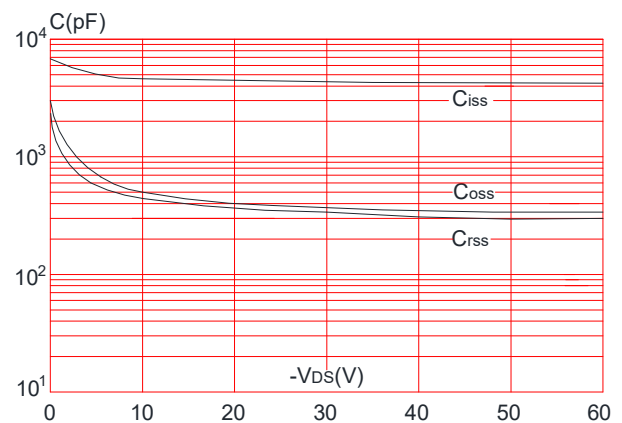


Figure 7: Normalized Breakdown Voltage vs. Junction Temperature

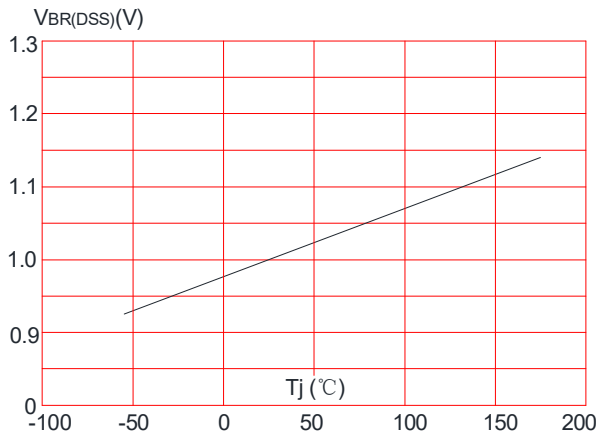


Figure 8: Normalized on Resistance vs. Junction Temperature

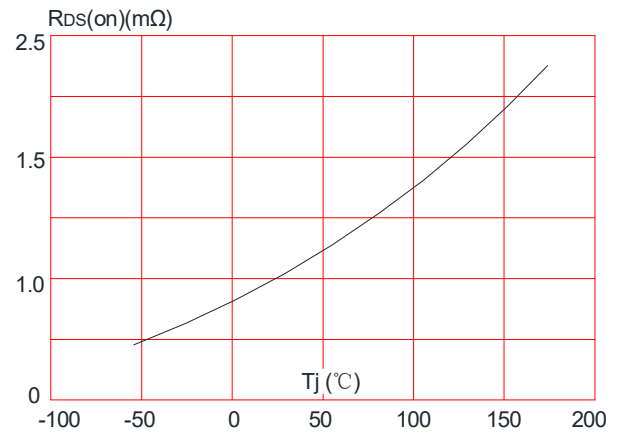


Figure 9: Maximum Safe Operating Area

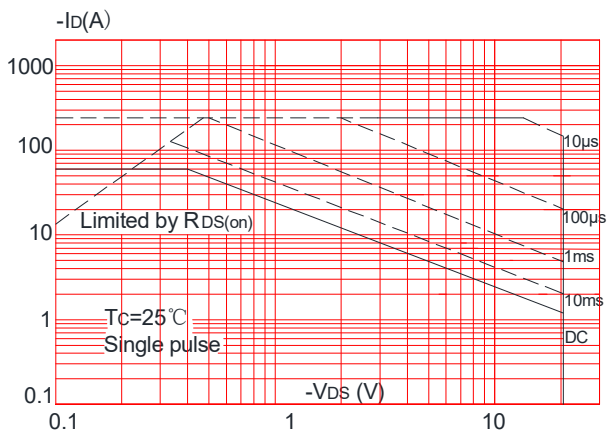


Figure 10: Maximum Continuous Drain Current vs. Case Temperature

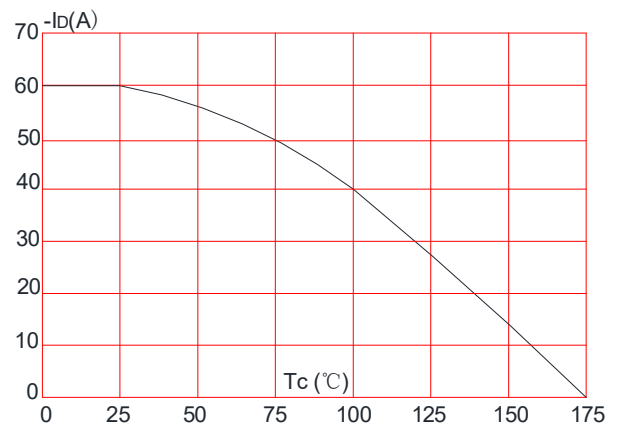
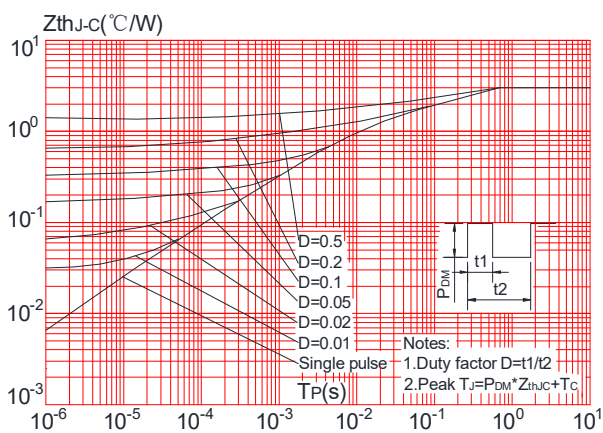
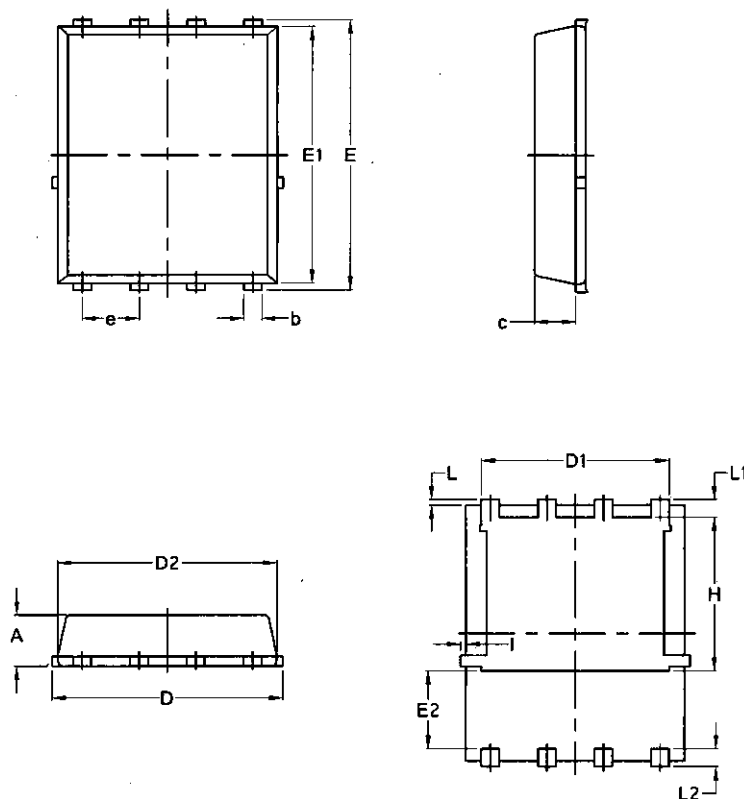


Figure.11: Maximum Effective Transient Thermal Impedance, Junction-to-Case



Package Mechanical Data-PDFN3333-8L-Single



COMMON DIMENSIONS

(UNITS OF MEASURE=MILLIMETER)

SYMBOL	MIN	NOM	MAX
A	0.70	0.80	0.90
A1	0.00	0.03	0.05
b	0.24	0.30	0.35
c	0.10	0.15	0.20
D	3.25	3.32	3.40
D1	3.05	3.15	3.25
D2	2.40	2.50	2.60
E	3.00	3.10	3.20
E1	1.35	1.45	1.55
e	0.65 BSC.		
H	3.20	3.30	3.40
L	0.30	0.40	0.50
L1	0.10	0.15	0.20
L2	1.13 REF.		