

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

Product Summary

RoHS

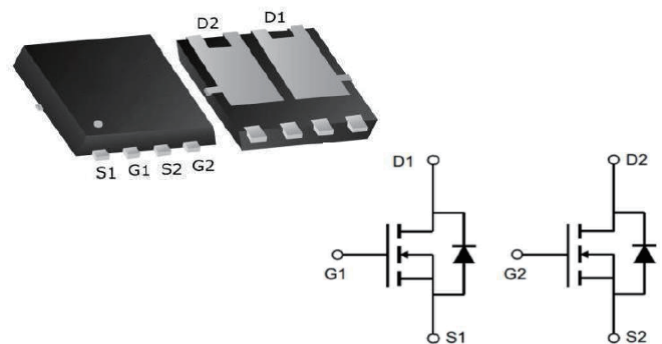
BVDSS	RDS(on)	ID
30V	10mΩ	30A

Description

The 302 is the high cell density trench N-ch MOSFETs, which provide excellent $R_{DS(on)}$ and gate charge for most of the synchronous buck converter applications.

The 302 meet the RoHS and Green Product, requirement 100% EAS guaranteed with full function reliability approved.

PDFN3X3-8 Pin Configuration



Absolute Maximum Ratings

Symbol	Parameter	Rating	Units
V_{DS}	Drain-Source Voltage	30	V
V_{GS}	Gate-Source Voltage	± 20	V
$I_D @ T_A = 25^\circ C$	Continuous Drain Current, $V_{GS} @ 10V^1$	30	A
$I_D @ T_A = 70^\circ C$	Continuous Drain Current, $V_{GS} @ 10V^1$	18	A
I_{DM}	Pulsed Drain Current ²	50	A
EAS	Single Pulse Avalanche Energy ³	24.2	mJ
I_{AS}	Avalanche Current	22	A
$P_D @ T_A = 25^\circ C$	Total Power Dissipation ⁴	1.5	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	---	85	$^\circ C/W$

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

Symbol	Parameter	Test Condition	Min.	Typ.	Max.	Units
$V_{(BR)DSS}$	Drain-Source Breakdown Voltage	$V_{GS}=0V, I_D=250\mu A$	30	-	-	V
I_{DSS}	Zero Gate Voltage Drain Current	$V_{DS}=30V, V_{GS}=0V,$	-	-	1	μA
I_{GSS}	Gate to Body Leakage Current	$V_{DS}=0V, V_{GS}=\pm 20V$	-	-	± 100	nA
$V_{GS(th)}$	Gate Threshold Voltage	$V_{DS}=V_{GS}, I_D=250\mu A$	1	1.5	2.5	V
$R_{DS(on)}$	Static Drain-Source on-Resistance note ³	$V_{GS}=10V, I_D=10A$	-	10	14	m Ω
		$V_{GS}=4.5V, I_D=5A$	-	18	25	
C_{iss}	Input Capacitance	$V_{DS}=15V, V_{GS}=0V, f=1.0MHz$	-	614	-	pF
C_{oss}	Output Capacitance		-	118	-	pF
C_{rss}	Reverse Transfer Capacitance		-	98	-	pF
Q_g	Total Gate Charge	$V_{DS}=15V, I_D=11A, V_{GS}=10V$	-	16	-	nC
Q_{gs}	Gate-Source Charge		-	2.7	-	nC
Q_{gd}	Gate-Drain("Miller") Charge		-	4.5	-	nC
$t_{d(on)}$	Turn-on Delay Time	$V_{DS}=15V, R_L=1.35\Omega, R_{GEN}=3\Omega,$ $V_{GS}=10V$	-	6	-	ns
t_r	Turn-on Rise Time		-	10	-	ns
$t_{d(off)}$	Turn-off Delay Time		-	30	-	ns
t_f	Turn-off Fall Time		-	6.5	-	ns
I_S	Maximum Continuous Drain to Source Diode Forward Current	$V_{GS}=0V, I_S=15A$	-	-	30	A
I_{SM}	Maximum Pulsed Drain to Source Diode Forward Current		-	-	60	A
V_{SD}	Drain to Source Diode Forward Voltage	$V_{GS}=0V, I_S=15A$	-	-	1.2	V
t_{rr}	Body Diode Reverse Recovery Time	$I_F=11A, di/dt=500A/\mu s$	-	7	-	ns
Q_{rr}	Body Diode Reverse Recovery Charge		-	10	-	nC

Thermal Data

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
I_S	Continuous Source Current ^{1,5}	$V_G=V_D=0V$, Force Current	---	---	30	A
V_{SD}	Diode Forward Voltage ²	$V_{GS}=0V, I_S=1A, T_J=25^\circ C$	---	---	1	V
t_{rr}	Reverse Recovery Time	$I_F=8A, di/dt=100A/\mu s, T_J=25^\circ C$	---	8	---	nS
Q_{rr}	Reverse Recovery Charge		---	2.9	---	nC

Typical Performance Characteristics

Figure1: Output Characteristics

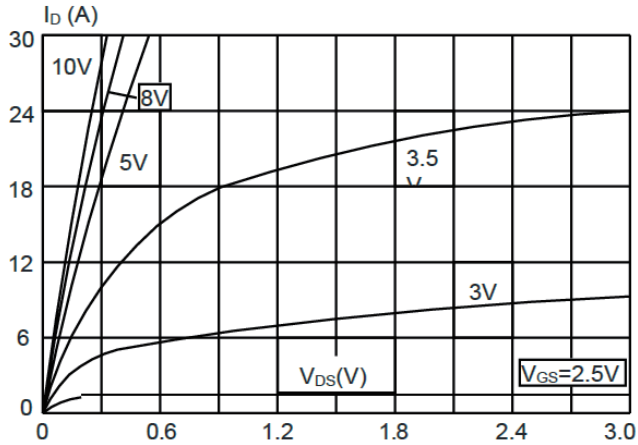


Figure 2: Typical Transfer Characteristics

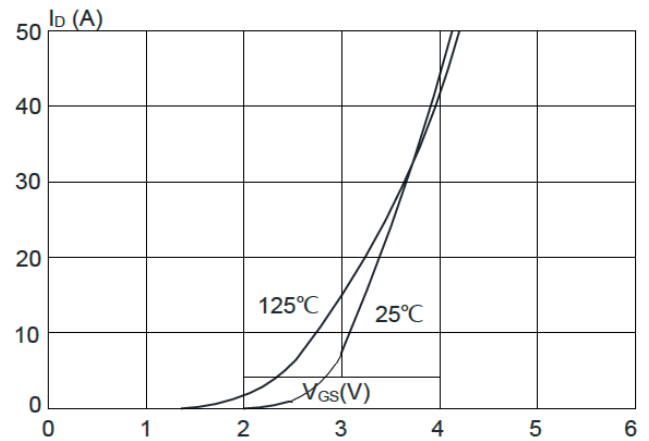


Figure 3: On-resistance vs. Drain Current

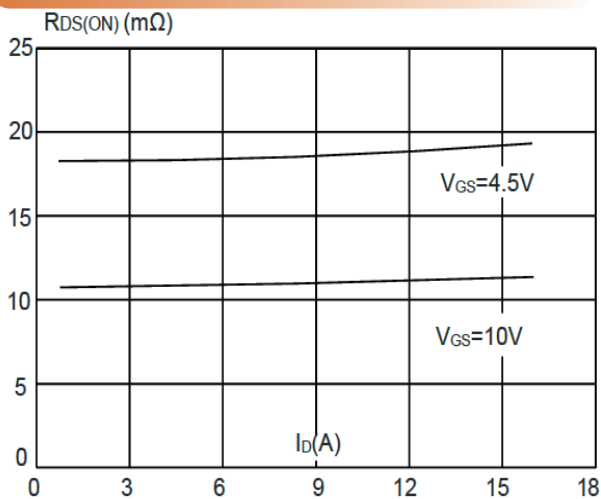


Figure 4: Body Diode Characteristics

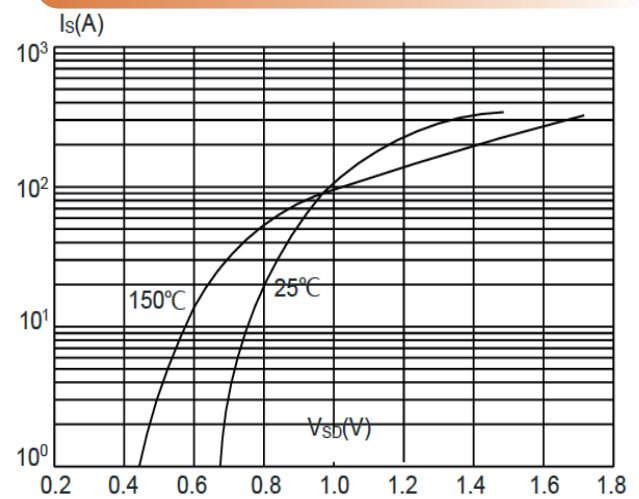


Figure 5: Gate Charge Characteristics

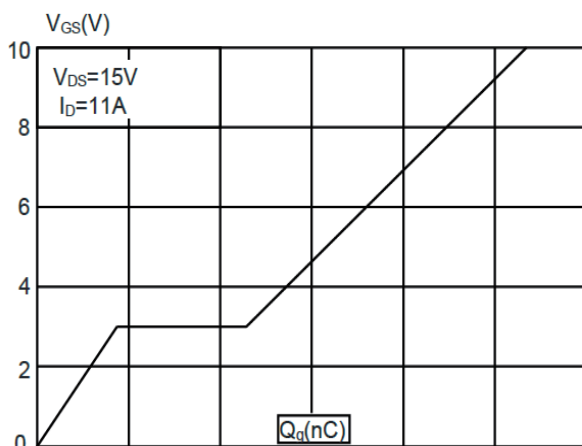
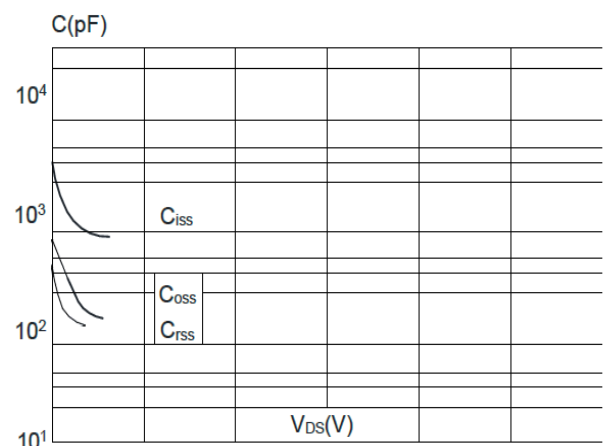


Figure 6: Capacitance Characteristics



Typical Performance Characteristics

Figure 7: Normalized Breakdown Voltage

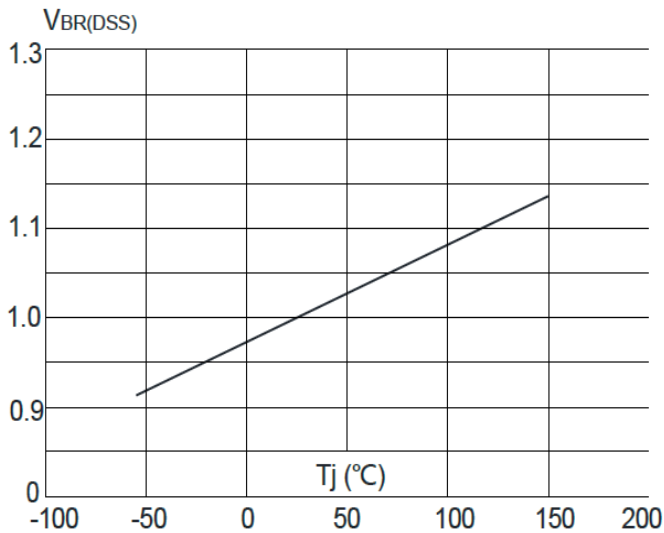


Figure 8: Normalized on Resistance vs. Junction Temperature

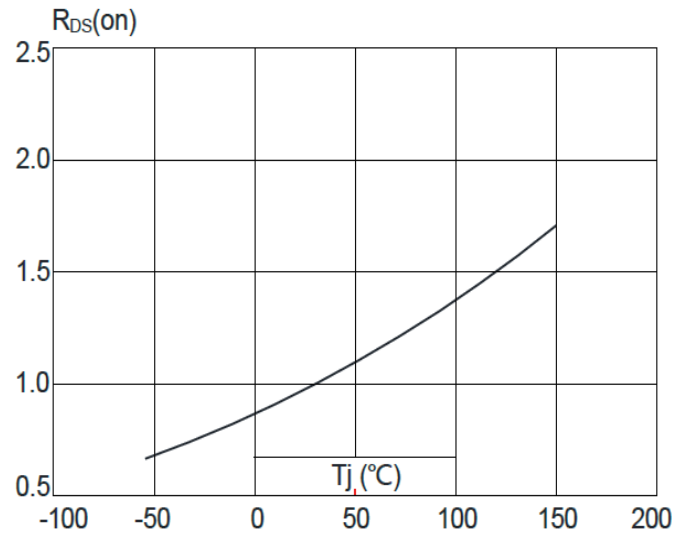


Figure 9: Maximum Safe Operating Area

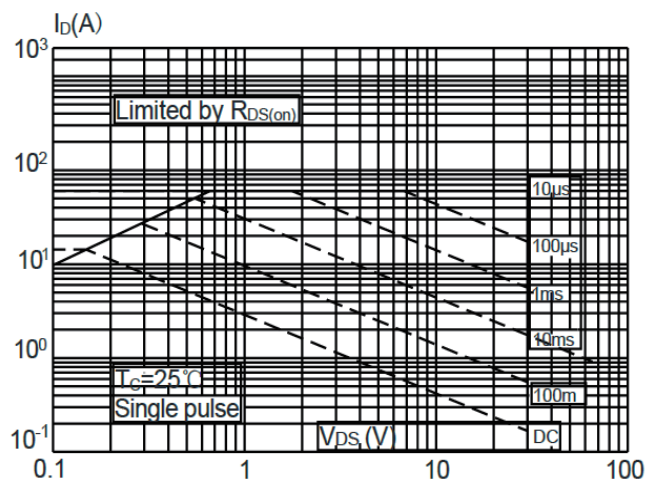


Figure 10: Maximum Continuous Drain Current vs. Temperature

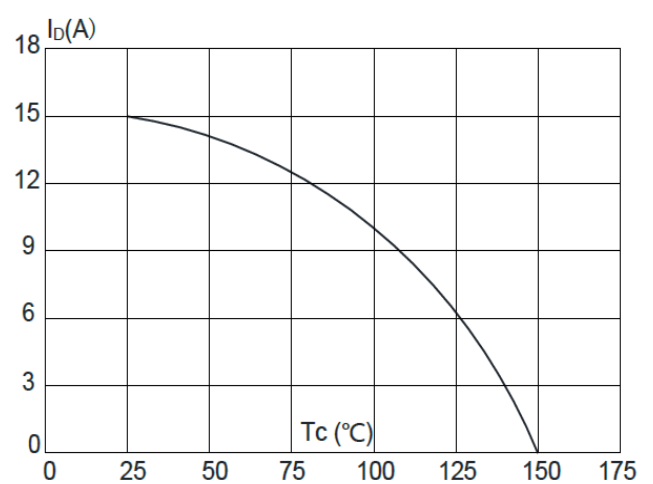
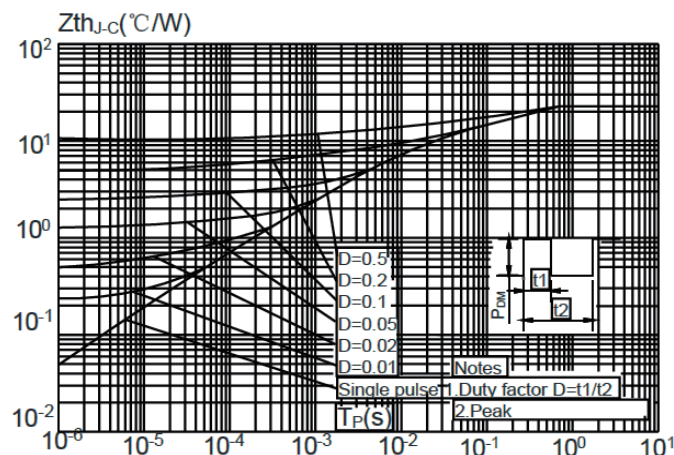
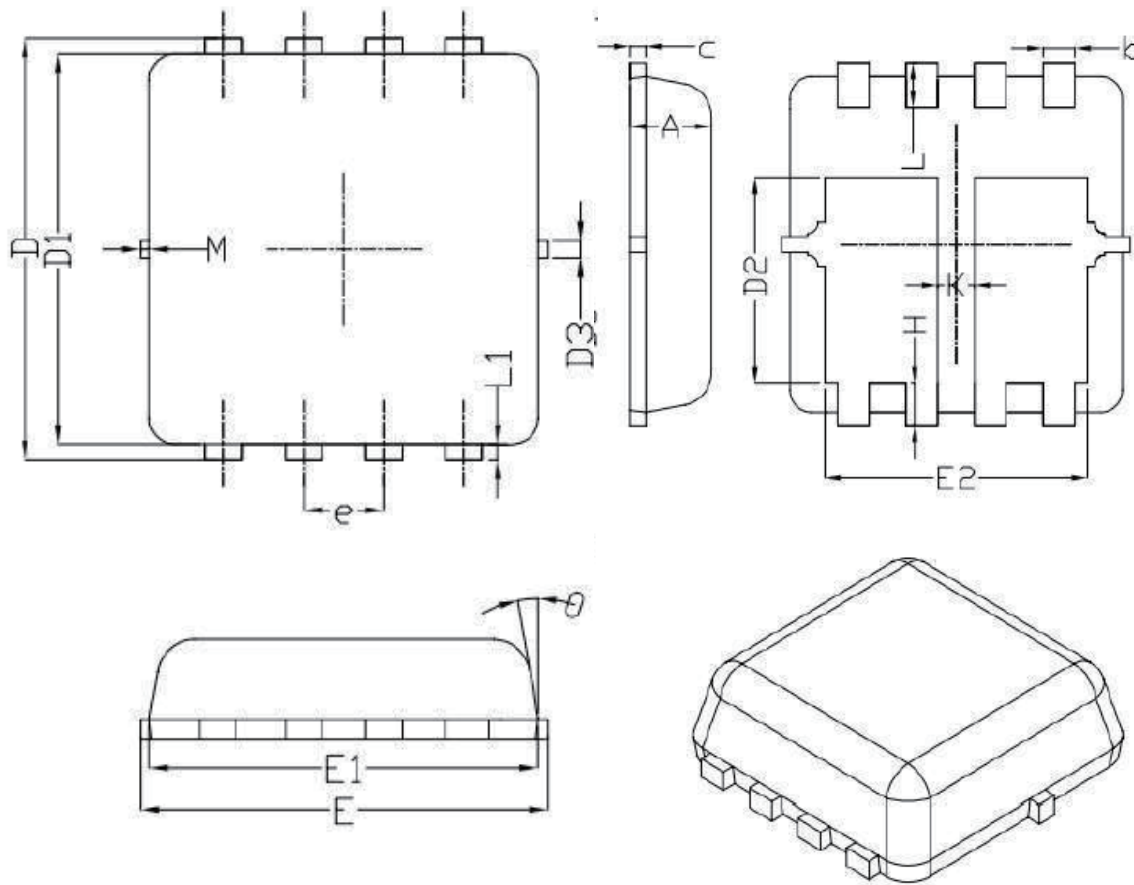


Figure.11: Maximum Effective Transient Thermal Impedance



Dual PDFN3X 3 Package Outline Data



Symbol	Dimensions (unit: mm)		
	Min	Typ	Max
A	0.7	0.75	0.8
b	0.25	0.3	0.35
c	0.1	0.15	0.25
D	3.25	3.35	3.45
D1	3	3.1	3.2
D2	1.78	1.88	1.98
D3	--	0.13	--
E	3.2	3.3	3.4
E1	3	3.15	3.2
E2	2.39	2.49	2.59
e	0.65 BSC		
H	0.3	0.39	0.5
L	0.3	0.4	0.5
L1	--	0.13	--
K	0.3	--	--
θ	--	10°	12°
M	*	*	0.15
* Not Specified			

Notes:

- 1.Refer to JEDEC MO-240 variation CA.
- 2.Dimensions "D1" and "E1" do NOT include mold flash protrusions or gate burrs.
- 3.Dimensions "D1" and "E1" include interterminal flash or protrusion.