AP03500BR

30V P-Channel MOSFET

Features

- Advanced high cell density Trench technology
- Super Low Gate Charge
- Excellent CdV/dt effect decline
- Green Device Available
- ESD Protected 2KV Embedded

Applications

- High Frequency Point-of-Load,Synchronous Buck Converter
- Networking DC-DC Power System
- Load Switch

Product Summary

V_{DS}	-30	V
I_D	-50	A
$R_{DS(ON)}$ (at V_{GS}=-10V)	9.5	mΩ
$R_{DS(ON)}$ (at V_{GS}=-4.5V)	16	mΩ

DFN3X3-8L Top View

Top View

S [1 ●]   [8] D
S [2]   [7] D
S [3]   [6] D
G [4]   [5] D
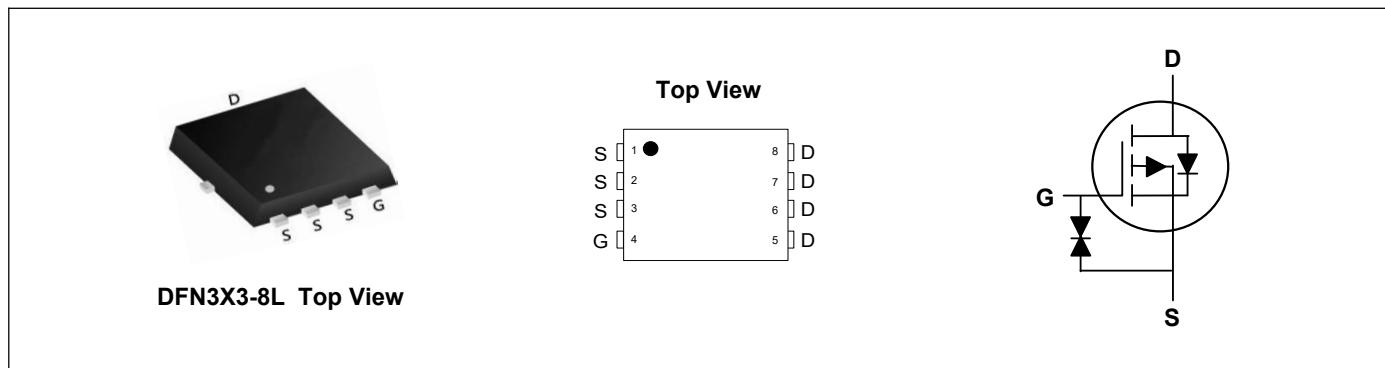
Absolute Maximum Ratings(T_A=25℃, unless otherwise noted)

Parameter	Symbol	Rating	Units
Drain-Source Voltage	V_{DS}	-30	V
Gate-Source Voltage	V_{GS}	±25	V
Continuous Drain Current[1]	I_D@T_C=25℃	-50	A
Continuous Drain Current[1]	I_D@T_C=100℃	-31	A
Continuous Drain Current[1]	I_D@T_A=25℃	-17.1	A
Continuous Drain Current[1]	I_D@T_A=70℃	-13.7	A
Pulsed Drain Current[2]	I_{DM}	-200	A
Single Pulse Avalanche Energy[3]	EAS	72	mJ
Avalanche Current	I_{AS}	38	A
Total Power Dissipation[3]	P_D@T_C=25℃	35.7	W
Total Power Dissipation[3]	P_D@T_C=100℃	14.3	W
Total Power Dissipation[3]	P_D@T_A=25℃	4.2	W
Total Power Dissipation[3]	P_D@T_A=70℃	2.7	W
Storage Temperature Range	T_{STG}	-55 to 150	℃
Operating Junction Temperature Range	T_J	-55 to 150	℃

Thermal Characteristics

Parameter	Symbol	Typ	Max	Unit
Thermal Resistance Junction-Ambient[1]	$R_{θJC}$	---	75	℃/W
Thermal Resistance Junction-Case[1]	$R_{θJC}$	---	3.5	℃/W

Electrical Characteristics (T_J=25℃, unless otherwise noted)

| Parameter	Symbol	Conditions	Min	Typ	Max	Unit
Drain-Source Breakdown Voltage	BV_{DSS}	V_{GS}=0V , I_D=-250uA	-30	---	---	V
Static Drain-Source On-Resistance[2]	$R_{DS(ON)}$	V_{GS}=-10V , I_D=-17.1A	---	7.5	9.5	mΩ
		V_{GS}=-4.5V , I_D=-10A	---	12	16	mΩ
Gate Threshold Voltage	$V_{GS(th)}$	V_{GS}=V_{DS} , I_D =-250uA	-1.3	-1.8	-2.3	V
Drain-Source Leakage Current	I_{DSS}	V_{DS}=-24V, V_{GS}=0V, T_J=25℃	---	---	-1	uA
		V_{DS}=-24V, V_{GS}=0V, T_J=85℃	---	---	-30	uA
Gate-Source Leakage Current	I_{GSS}	V_{GS}=±20V , V_{DS}=0V	---	---	±10	uA
Gate Resistance	R_g	V_{DS}=0V , V_{GS}=0V , f=1MHz	---	8	---	Ω
Total Gate Charge	Q_g	V_{DS}=-15V , V_{GS}=-10V , I_D=-17.1A	---	45	---	nC
Gate-Source Charge	Q_{gs}		---	5	---	
Gate-Drain Charge	Q_{gd}		---	12.7	---	
Turn-On Delay Time	$T_{d(on)}$	V_{DD}=-15V , V_{GS}=-10V , R_G=6Ω, R_L=15Ω,I_D=-1A	---	12	---	ns
Rise Time	T_r		---	14	---	
Turn-Off Delay Time	$T_{d(off)}$		---	98	---	
Fall Time	T_f		---	60	---	
Input Capacitance	C_{iss}	V_{DS}=-15V, V_{GS}=0V, f=1MHz	---	2110	---	pF
Output Capacitance	C_{oss}		---	450	---	
Reverse Transfer Capacitance	C_{rss}		---	330	---	

Drain-Source Diode Characteristics

Parameter	Symbol	Conditions	Min	Typ	Max	Unit
Continuous Source Current[1]	I_S	T_C=25℃	---	---	-5	A
Diode Forward Voltage[2]	V_{SD}	V_{GS}=0V , I_S=-1A , T_J=25℃	---	-0.7	-1.0	V
Reverse Recovery Time	t_{rr}	I_F=-17.1A ,di/dt=100A/µs, T_J=25℃	---	24	---	nS
Reverse Recovery Charge	Q_{rr}		---	16	---	nC

Note:

1.The data tested by surface mounted on a 1 inch[2] FR-4 board with 2OZ copper.

2.The data tested by pulsed , pulse width ≦ 300us , duty cycle ≦ 2%

3.The power dissipation is limited by 150℃ junction temperature

Typical Characteristics

Power Dissipation

Drain Current

Safe Operation Area

Thermal Transient Impedance

Output Characteristics

Drain-Source On Resistance

Gate-Source On Resistance

Gate Threshold Voltage

Drain-Source On Resistance

Source-Drain Diode Forward

Capacitance

Gate Charge

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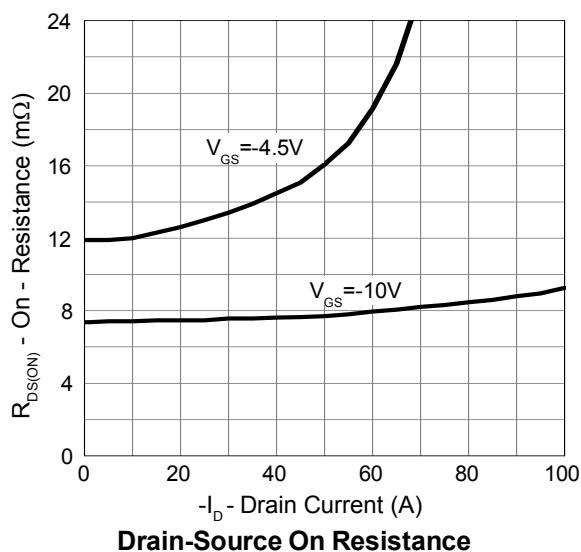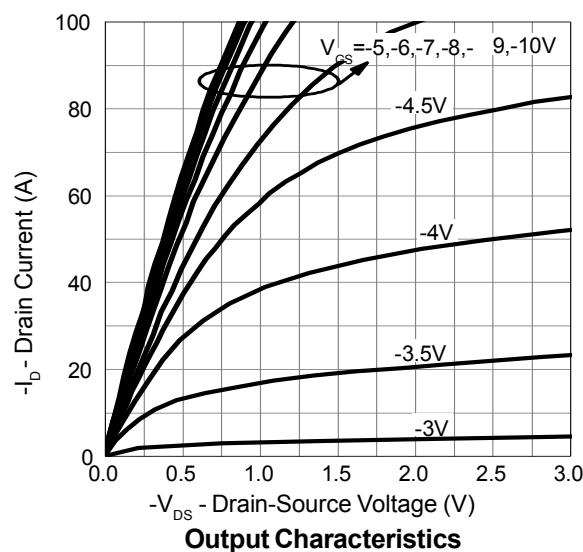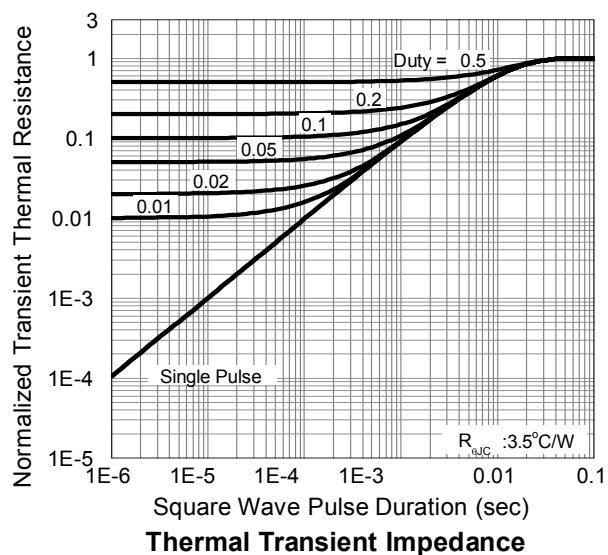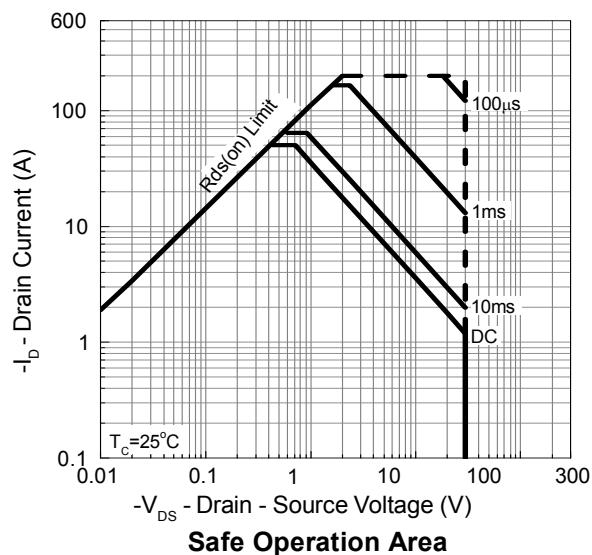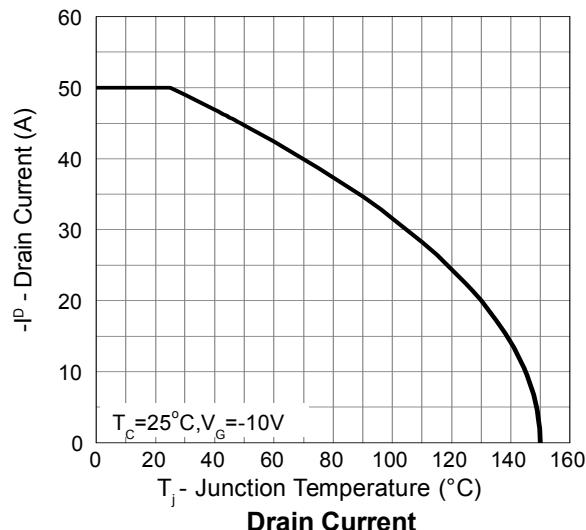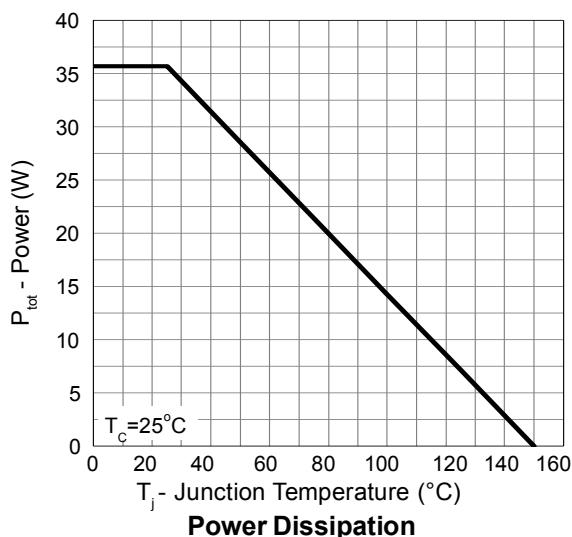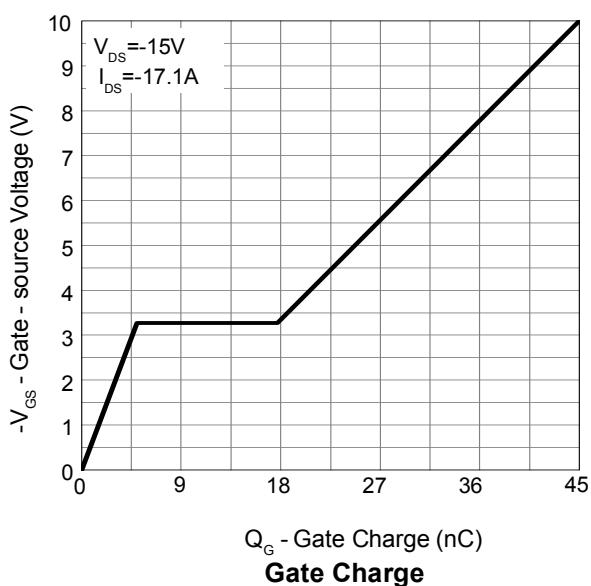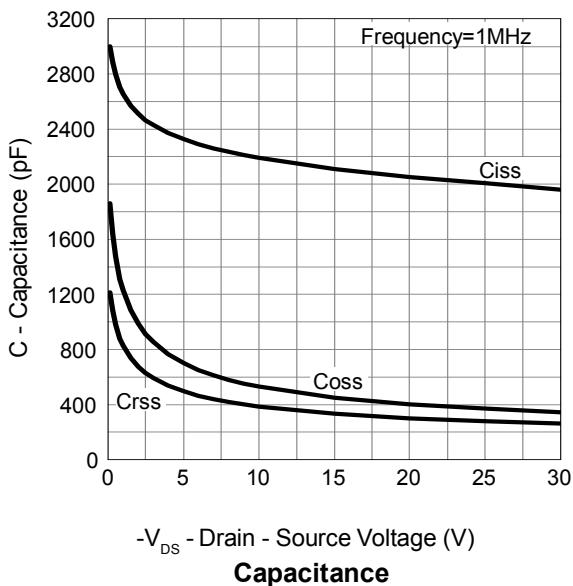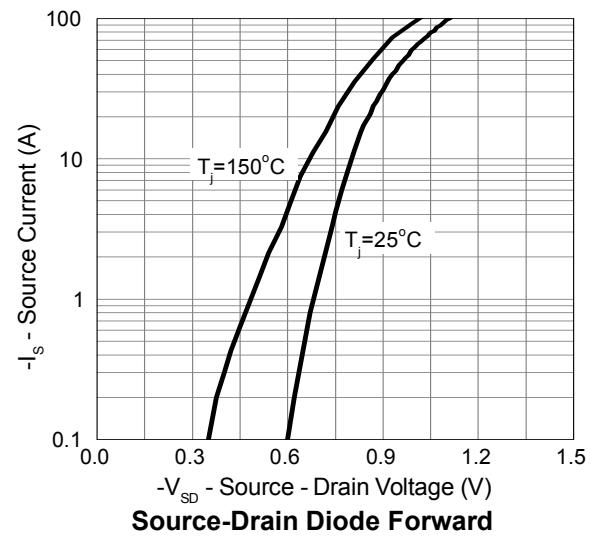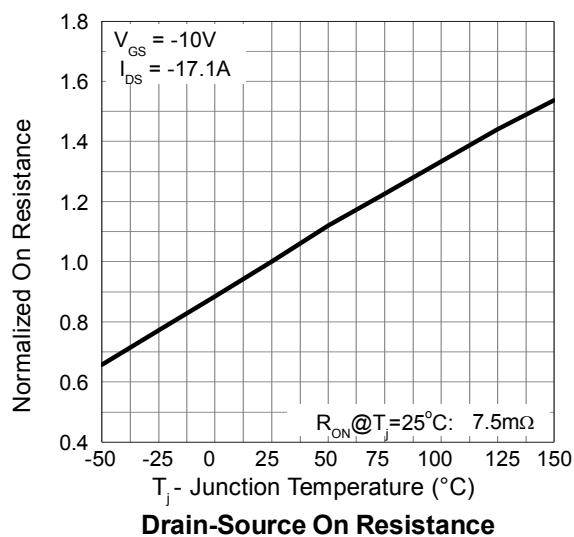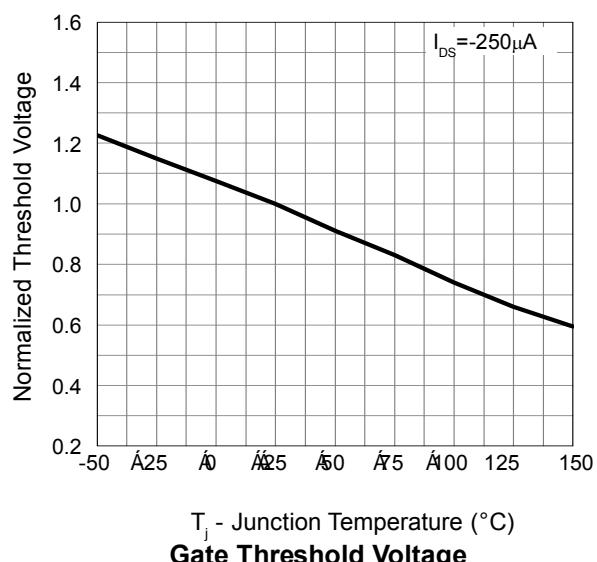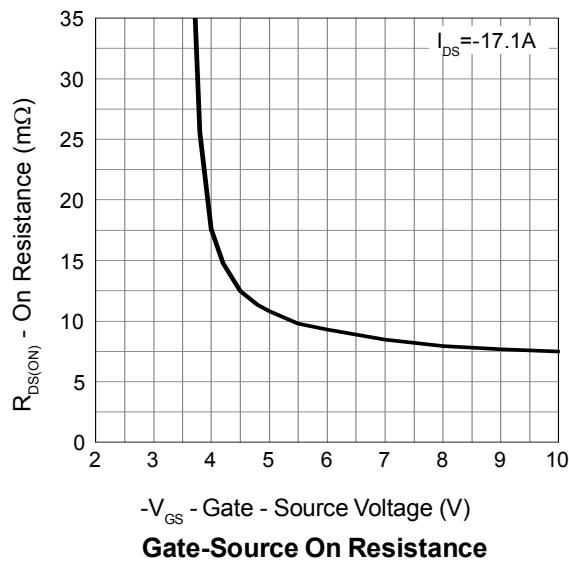
DFN3X3-8L Package Outline Dimensions
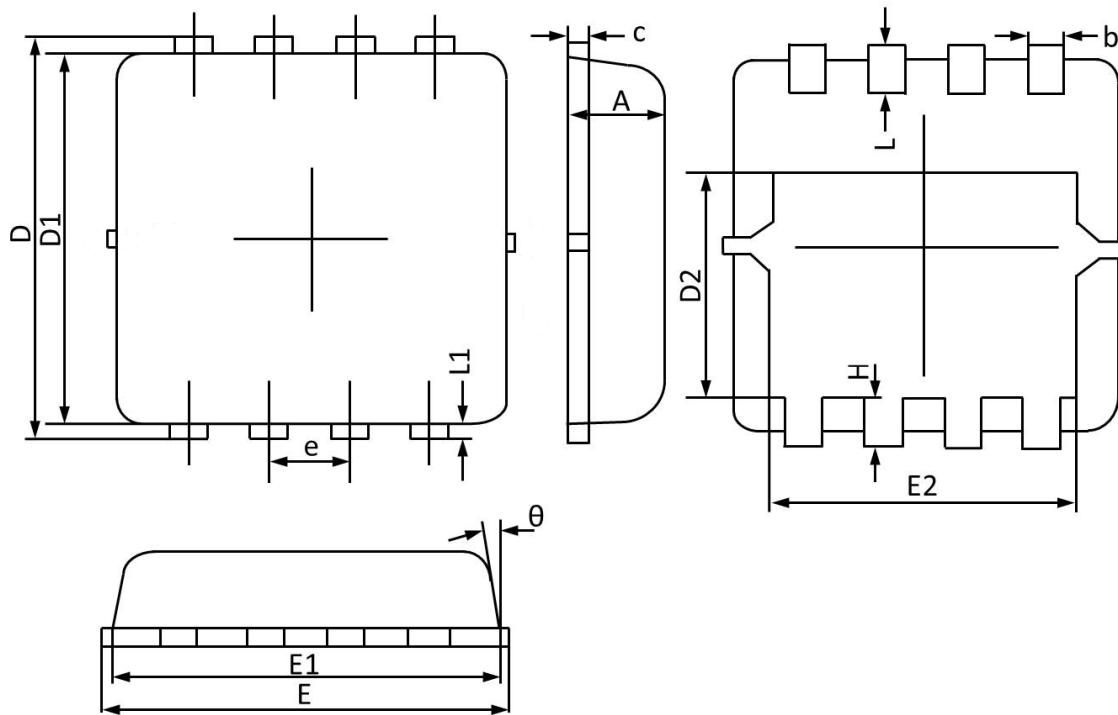
Symbol	Dimensions (unit:mm)			Symbol	Dimensions (unit:mm)		
	Min	Typ	Max		Min	Typ	Max
A	0.70	0.75	0.85	E1	2.90	3.10	3.25
b	0.24	0.30	0.35	E2	2.35	2.50	2.60
c	0.10	0.17	0.25	e	0.65 BSC		
D	3.10	3.30	3.45	H	0.30	0.40	0.50
D1	2.90	3.05	3.20	L	0.30	0.40	0.50
D2	1.45	1.70	1.95	L1	--	0.13	--
E	3.05	3.25	3.40	θ	0°		14°