AD12P06S

P-Channel Enhancement Mode Power MOSFET

Product Summary

$V_{(BR)DSS}$	$R_{DS(on)MAX}$	I_D
-60V	100mΩ@-10V	-12A
	125mΩ@-4.5V	

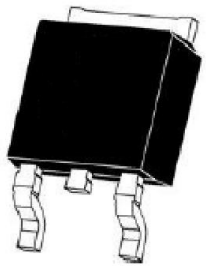
Feature

- High density cell design for ultra low Rdson
- Fully characterized avalanche voltage and current
- Good stability and uniformity with high E_{AS}
- Excellent package for good heat dissipation

Application

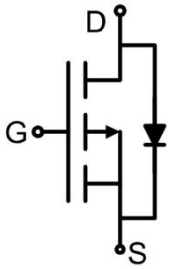
- High side switch for full bridge converter
- DC/DC converters for LCD display

Package



TO-252AB

Circuit diagram



Marking

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Absolute maximum ratings (T_C=25℃ unless otherwise noted)

Parameter	Symbol	Value	Unit
Drain-Source Voltage	V_{DS}	-60	V
Gate-Source Voltage	V_{GS}	±20	V
Continuous Drain Current	I_D	-12	A
Continuous Drain Current(T_C=100℃)	I_D(100℃)	-8.5	A
Pulsed Drain Current	I_{DM}	-30	A
Power Dissipation	P_D	60	W
Avalanche energy[4)]	E_{AS}	50	mJ
Thermal Resistance,Junction-to-Case[1)]	$R_{\theta JC}$	2.5	℃/W
Junction Temperature	T_J	175	℃
Storage Temperature	T_{STG}	-55 ~ +175	℃

Electrical characteristics (T_C=25 ℃ unless otherwise noted)

Parameter	Symbol	Test Condition	Min.	Typ.	Max.	Unit
Static Characteristics						
Drain-source breakdown voltage	$V_{(BR)DSS}$	V_{GS} = 0V, I_D =-250μA	-60			V
Zero gate voltage drain current	I_{DSS}	V_{DS} =-60V,V_{GS} = 0V			-1	μA
Gate-body leakage current	I_{GSS}	V_{GS} =±20V, V_{DS} = 0V			±100	nA
Gate threshold voltage[2)]	$V_{GS(th)}$	V_{DS} =V_{GS}, I_D =-250μA	-1.0	-1.5	-2.2	V
Drain-source on-resistance[2)]	$R_{DS(on)}$	V_{GS} =-10V, I_D =-12A		84	100	mΩ
		V_{GS} =-4.5V, I_D =-8A		100	125	
Forward Transconductance[2)]	g_{FS}	V_{GS} =-5V, I_D =-12A		10		S
Dynamic characteristics[3)]						
Input Capacitance	C_{iss}	V_{DS} =-30V,V_{GS} =0V,f =1MHz		1630.7		pF
Output Capacitance	C_{oss}			90.6		
Reverse Transfer Capacitance	C_{rss}			77.3		
Total Gate Charge	Q_g	V_{DS} =-30V,V_{GS} =-10V, I_D =-12A		37.6		nC
Gate-Source Charge	Q_{gs}			4.3		
Gate-Drain Charge	Q_{gd}			7.2		
Turn-on delay time	$t_{d(on)}$	V_{DD}=-30V,V_{GS} =-10V, R_L=1.5Ω,R_G=3Ω		11		nS
Turn-on rise time	t_r			14		
Turn-off delay time	$t_{d(off)}$			33		
Turn-off fall time	t_f			13		
Source-Drain Diode characteristics						
Diode Forward voltage[2)]	V_{SD}	V_{GS} =0V, I_S=-12A			-1.2	V
Diode Forward Current[1)]	I_S				-12	A
Reverse Recovery Time	t_{rr}	T_J=25℃,I_F=-12A, di/dt=-100A/μs[2)]		35		nS
Reverse Recovery Charge	Q_{rr}			38		nC

Notes:

1) Surface Mounted on FR4 Board, t ≤ 10 sec.

2) Pulse Test: Pulse Width ≤ 300μs, Duty Cycle ≤ 2%.

3) Guaranteed by design, not subject to production

4) EAS condition: Tj=25℃,V_{DD}=-20V,V_G=-10V,L=1mH,Rg=25Ω

Typical Characteristics

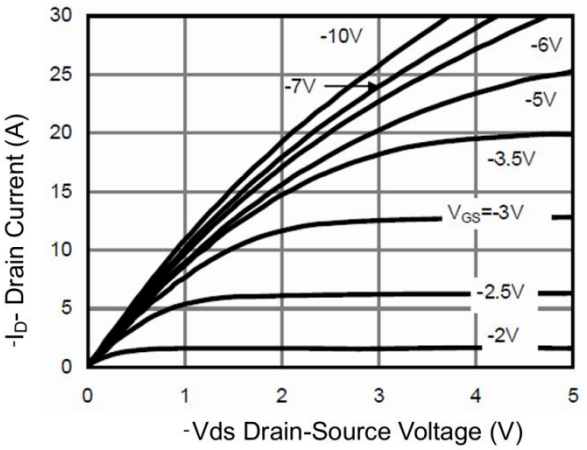


Figure 1 Output Characteristics

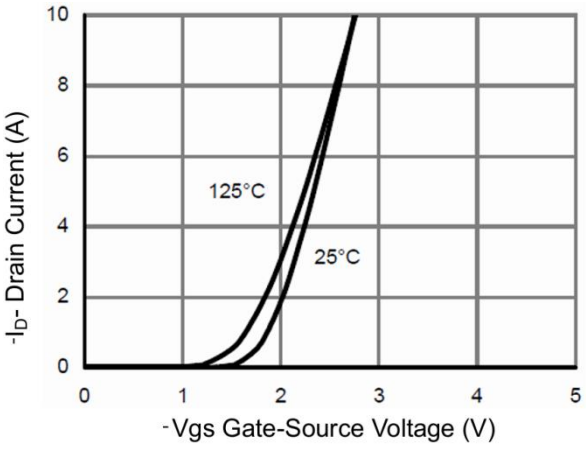


Figure 2 Transfer Characteristics

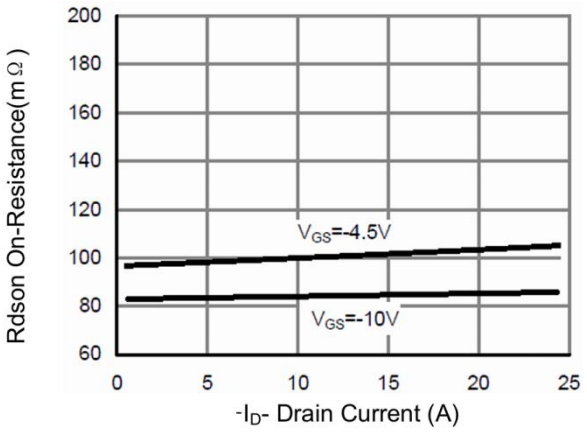


Figure 3 Rdson- Drain Current

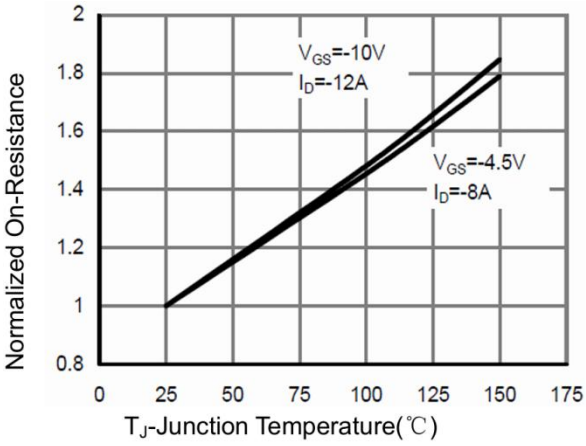


Figure 4 Rdson-Junction Temperature

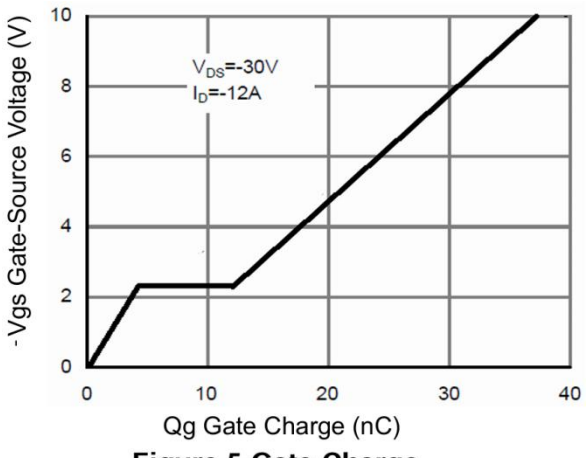


Figure 5 Gate Charge

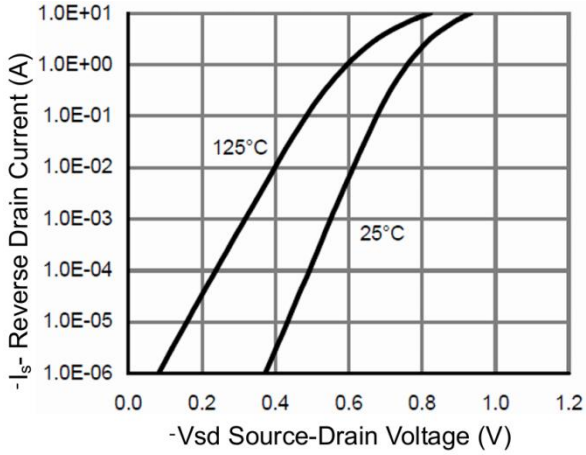


Figure 6 Source- Drain Diode Forward

Typical Characteristics

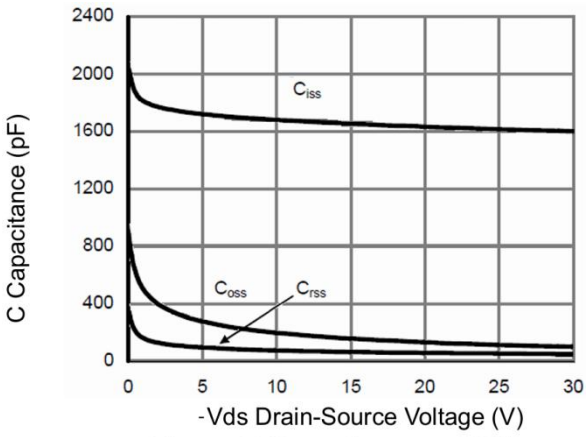


Figure 7 Capacitance vs Vds

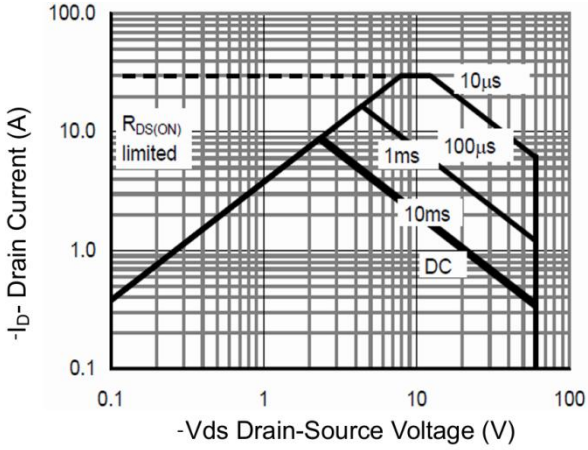


Figure 8 Safe Operation Area

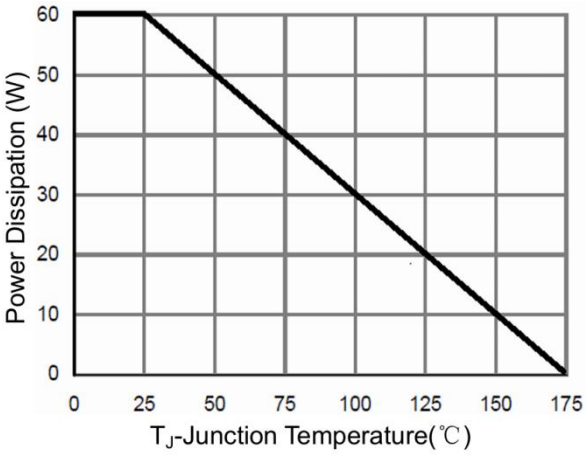


Figure 9 Power De-rating

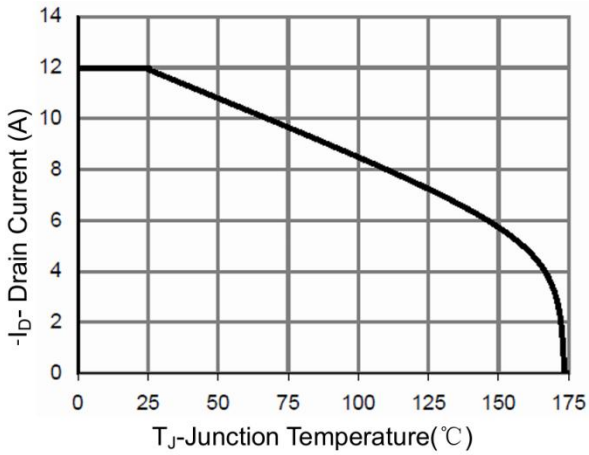


Figure 10 ID Current De-rating

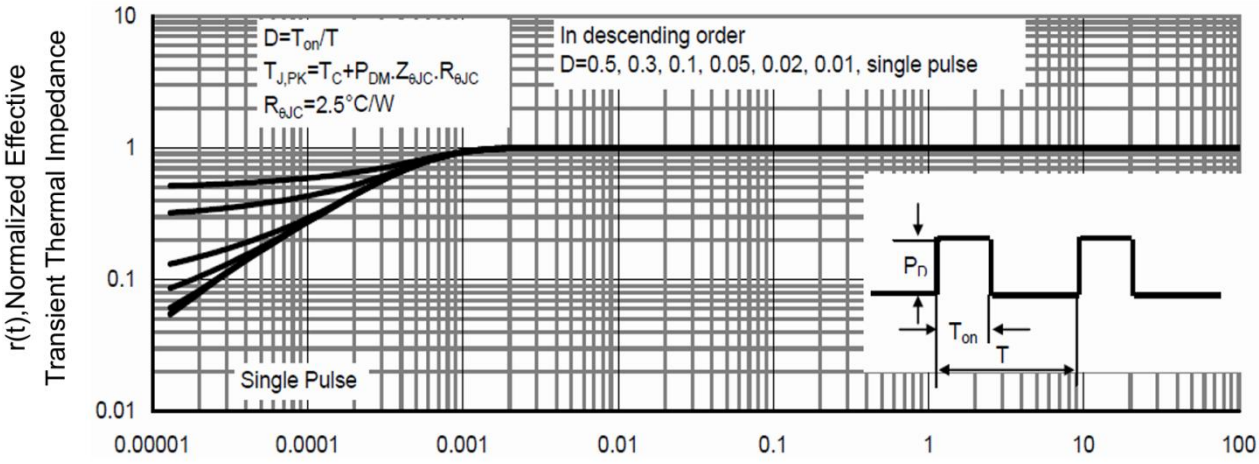
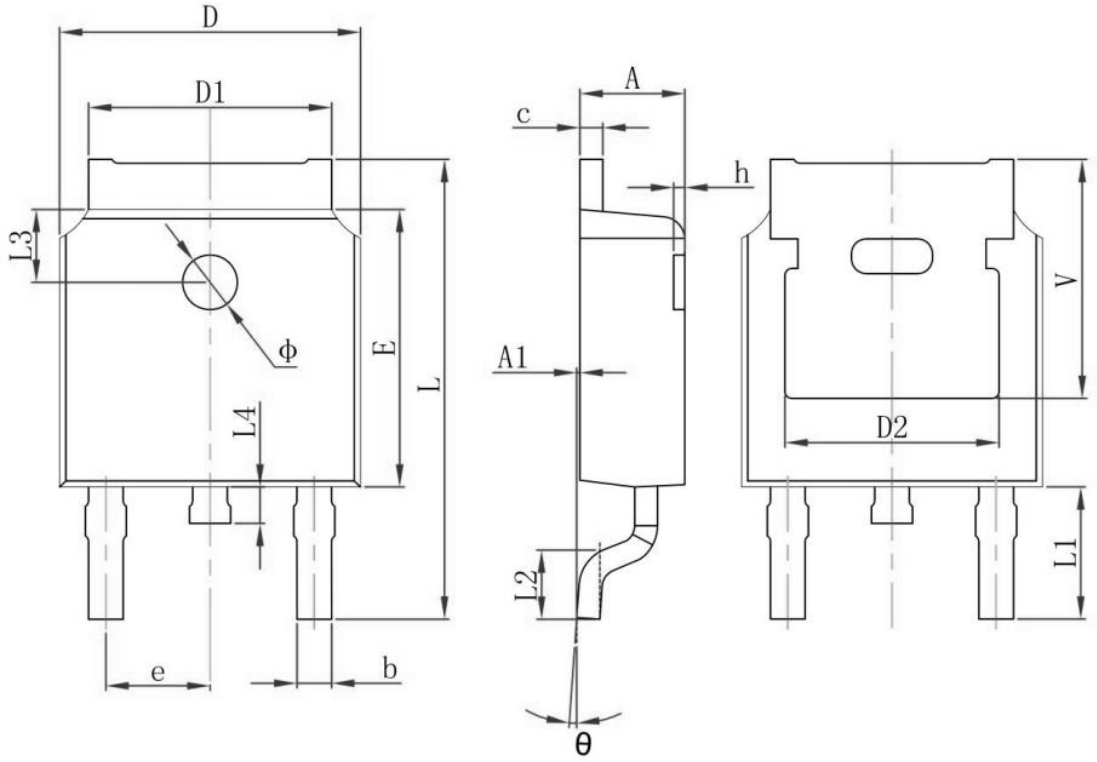


Figure 11 Normalized Maximum Transient Thermal Impedance

TO-252AB Package Information



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	2.200	2.400	0.087	0.094
A1	0.000	0.130	0.000	0.005
b	0.660	0.860	0.026	0.034
c	0.460	0.580	0.018	0.023
D	6.500	6.700	0.256	0.264
D1	5.100	5.500	0.201	0.217
D2	4.830 REF.		0.190 REF.	
E	6.000	6.200	0.236	0.244
e	2.186	2.390	0.086	0.094
h	0.000	0.300	0.000	0.012
L	9.800	10.500	0.386	0.413
L1	2.900 REF.		0.114 REF.	
L2	1.400	1.800	0.055	0.071
L3	1.600 REF.		0.063 REF.	
L4	0.600	1.000	0.024	0.039
V	5.350 REF.		0.211 REF.	
Φ	1.100	1.300	0.043	0.051
θ	0°	8°	0°	8°