AD30P03S-Q1

P-Channel Enhancement Mode Power MOSFET

Product Summary

$V_{(BR)DSS}$	$R_{DS(on)MAX}$	I_D
-30V	20mΩ@-10V	-30A
	30mΩ@-4.5V	

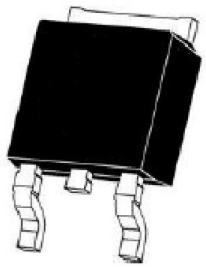
Feature

- 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
- Suffix “-Q1” for AEC-Q101

Application

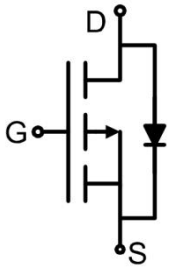
- High side switch for full bridge converte
- DC/DC converter for LCD displa

Package

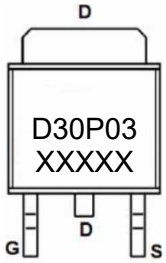


TO-252AB

Circuit diagram



Marking



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

Parameter	Symbol	Value	Unit
Drain-Source Voltage	V_{DS}	-30	V
Gate-Source Voltage	V_{GS}	±20	V
Continuous Drain Current	I_D	-30	A
Pulsed Drain Current	I_{DM}	-120	A
Power Dissipation	P_D	34	W
Thermal Resistance,Junction-to-Case	$R_{\theta JC}$	3.67	℃/W
Single pulse avalanche energy	E_{AS}	64	mJ
Junction Temperature	T_J	150	℃
Storage Temperature	T_{STG}	-55 ~ +150	℃

Electrical characteristics (T_J=25 °C, 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	-30			V
Zero gate voltage drain current	I_{DSS}	V_{DS} =-30V,V_{GS} = 0V			-1	μA
Gate-body leakage current	I_{GSS}	V_{GS} =±20V, V_{DS} = 0V			±100	nA
Gate threshold voltage	$V_{GS(th)}$	V_{DS} =V_{GS}, I_D =-250μA	-1.0		-2.5	V
Drain-source on-resistance[1]	$R_{DS(on)}$	V_{GS} =-10V, I_D =-20A			20	mΩ
		V_{GS} =-4.5V, I_D =-20A			30	
Dynamic characteristics[2]						
Input Capacitance	C_{iss}	V_{DS} =-15V,V_{GS} =0V,f =1MHz		1572		pF
Output Capacitance	C_{oss}			176		
Reverse Transfer Capacitance	C_{rss}			147		
Total Gate Charge	Q_g	V_{DS} =-15V,V_{GS} =-10V, I_D =-5A		29.2		nC
Gate-Source Charge	Q_{gs}			5.9		
Gate-Drain Charge	Q_{gd}			4.6		
Turn-on delay time	$t_{d(on)}$	V_{DD}=-150V,V_{GS}=-10V, I_D =-1A,R_{GEN}=6.0Ω		4.8		nS
Turn-on rise time	t_r			18.7		
Turn-off delay time	$t_{d(off)}$			53		
Turn-off fall time	t_f			33		
Source-Drain Diode characteristics						
Diode Forward Current[1]	I_S				-30	A
Diode Forward voltage	V_{DS}	V_{GS} =0V, I_S=-20A			-1.2	V
Reverse Recovery Time	t_{rr}	TJ = 25°C, IF =-10A di/dt = 100A/μs [1]		3		nS
Reverse Recovery Charge	Q_{rr}			11		nC

Notes:

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

2) Guaranteed by design, not subject to production testing.

Typical Characteristics

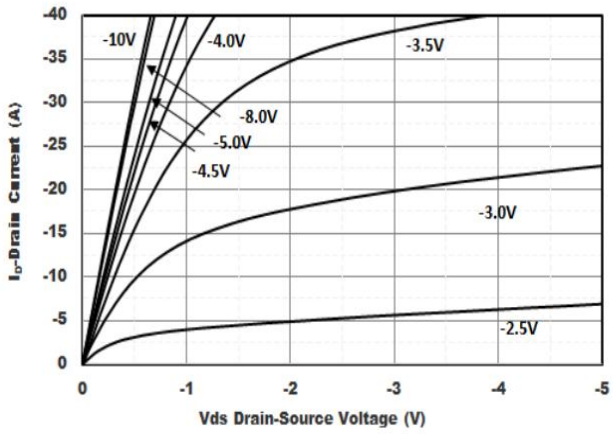


Figure1. Output Characteristics

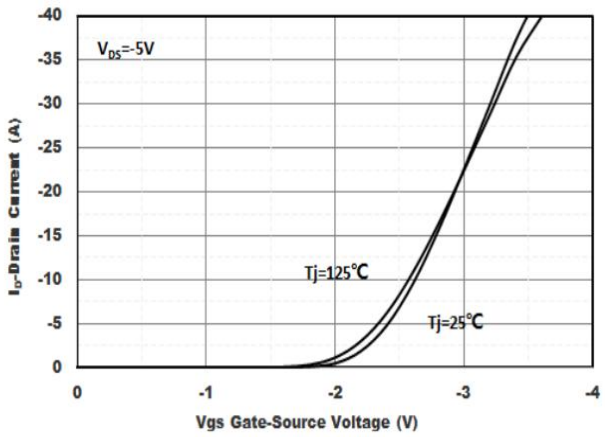


Figure2. Transfer Characteristics

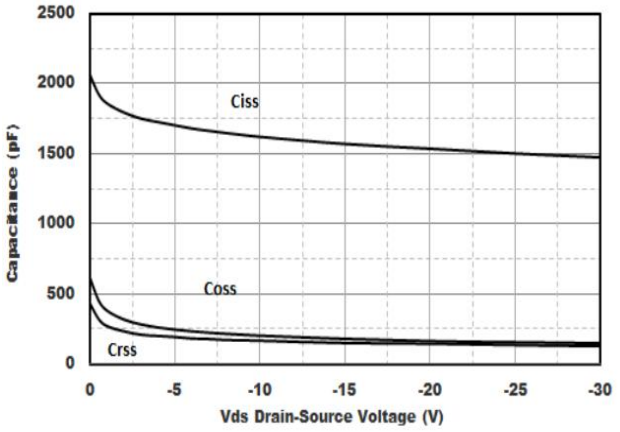


Figure3. Capacitance Characteristics

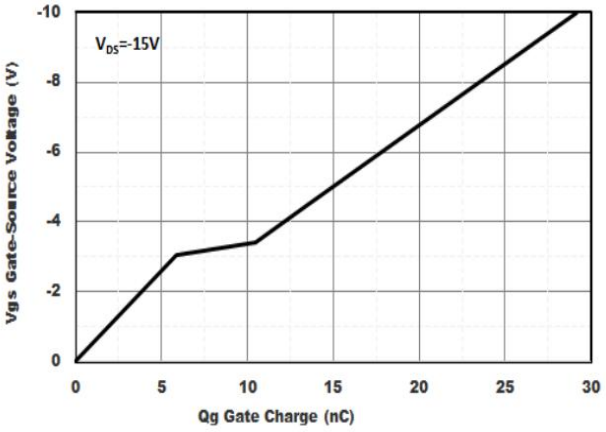


Figure4. Gate Charge

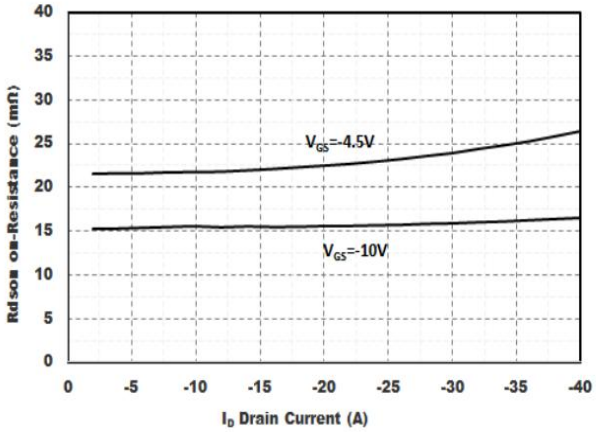


Figure5. Drain-Source on Resistance

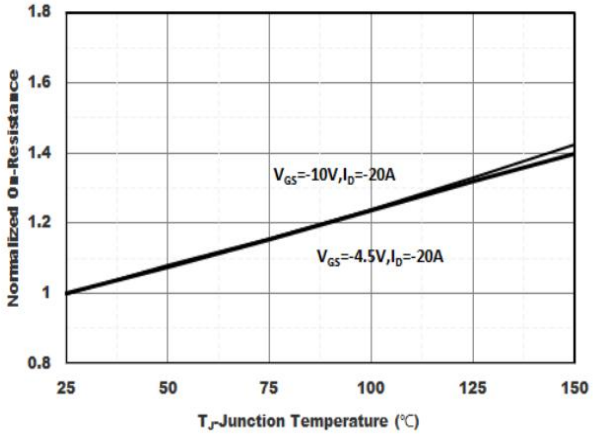


Figure6. Drain-Source on Resistance

Typical Characteristics

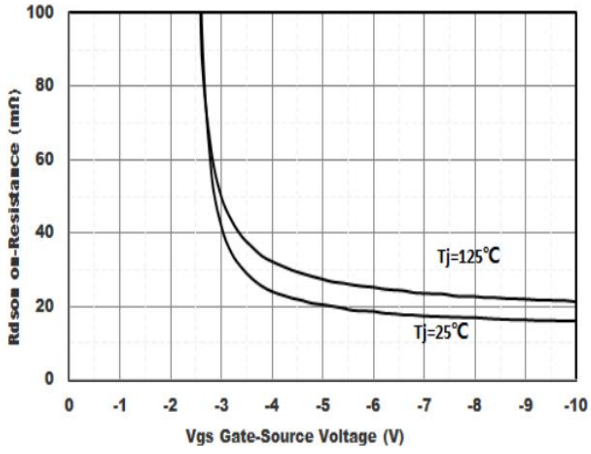


Figure7. On-Resistance vs V_{GS}

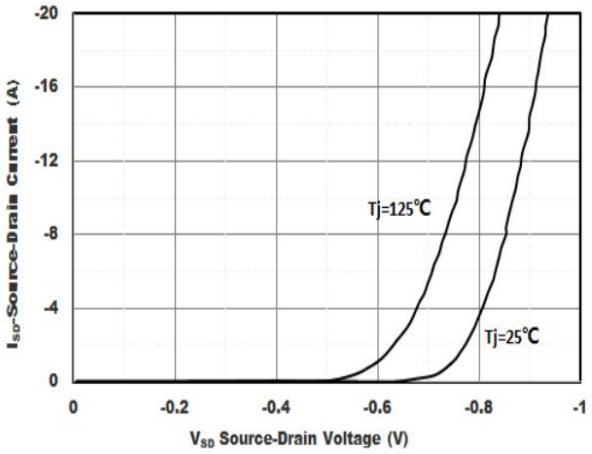


Figure8. Drain current vs. Case Temperature

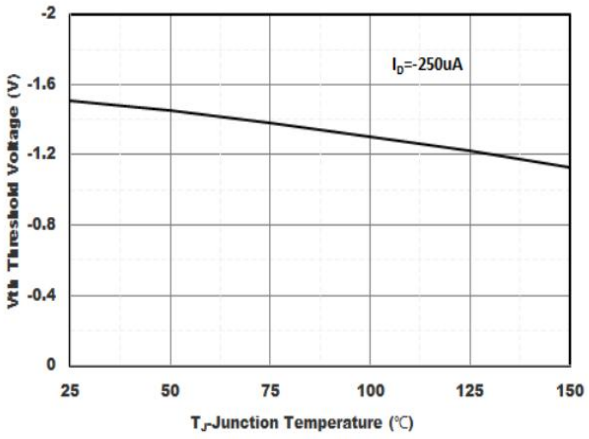


Figure9. Threshold Voltage vs Temperature

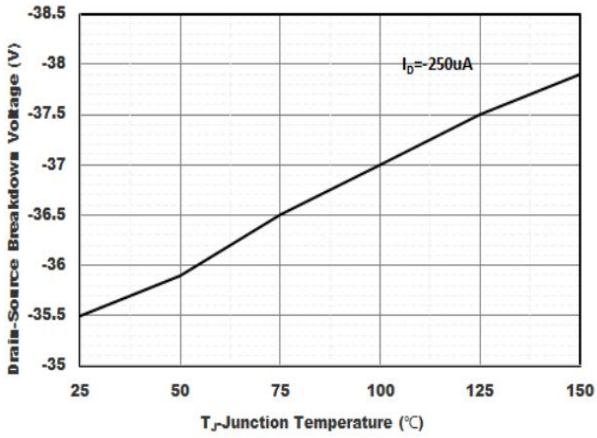


Figure10. Breakdown Voltage vs Temperature

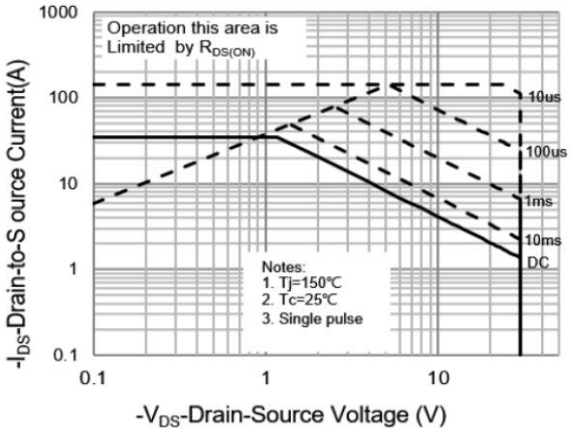


Figure11. Safe Operation Area

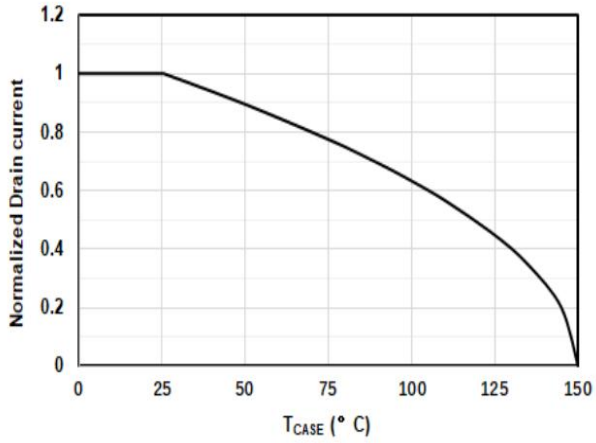


Figure12. Drain current vs. Case Temperature

Typical Characteristics

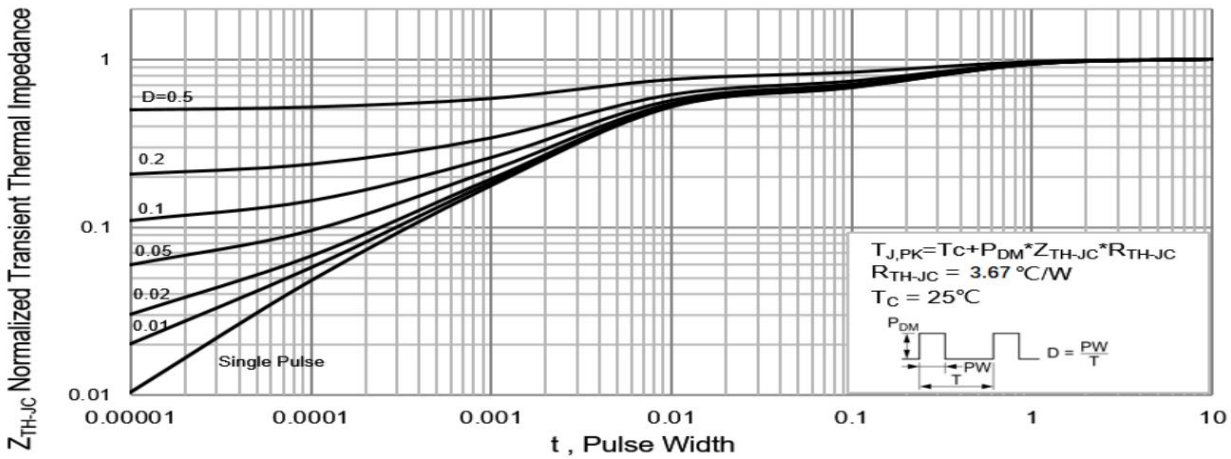
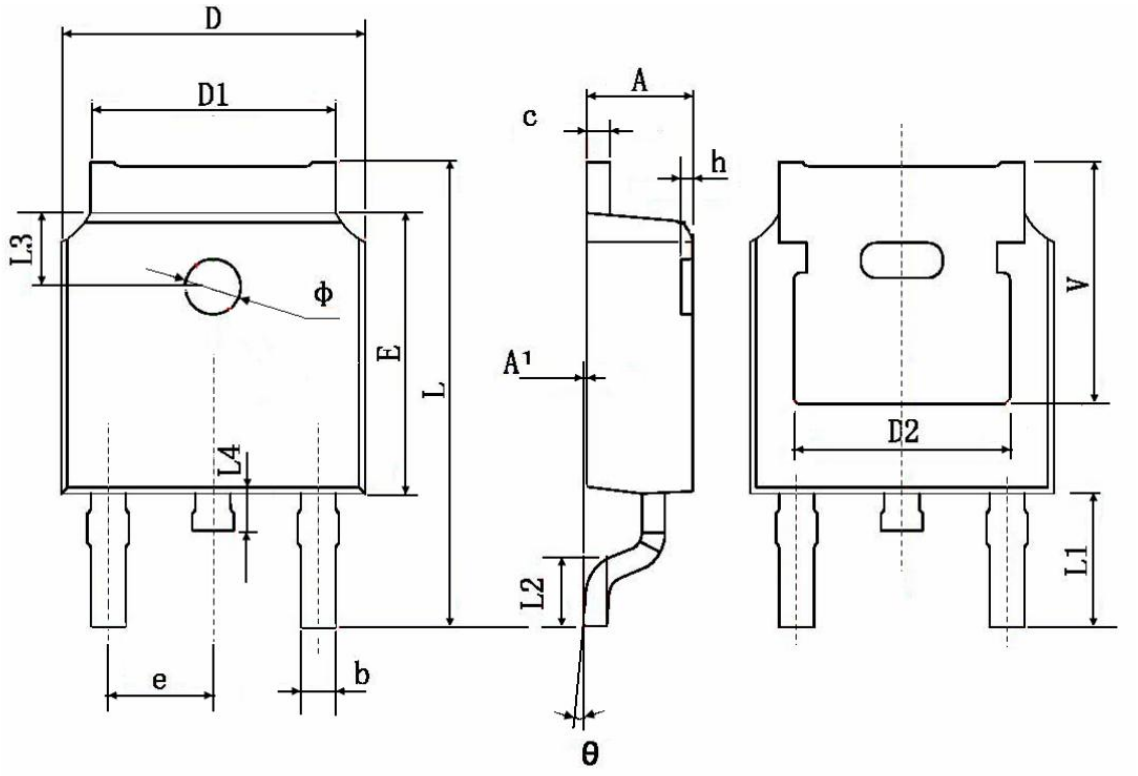


Figure13. Normalized Maximum Transient Thermal Impedance

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	0.200	0.000	0.008
b	0.660	0.860	0.026	0.043
c	0.460	0.580	0.018	0.023
D	6.500	6.700	0.256	0.264
D1	5.150	5.450	0.203	0.215
D2	4.600	4.950	0.181	0.195
E	6.000	6.200	0.236	0.244
e	2.286BSC		0.090BSC	
L	9.700	10.400	0.382	0.409
L1	2.900REF		0.114REF	
L2	1.250	1.750	0.049	0.069
L3	1.400	1.900	0.055	0.075
L4	0.600	1.000	0.024	0.039
θ	0°	10°	0°	10°