AD25P15ES-Q1

P-Channel Enhancement Mode Power MOSFET

Product Summary

$V_{(BR)DSS}$	$R_{DS(on)MAX}$	I_D
-145V	150mΩ@-10V	-25A
	160mΩ@-4.5V	

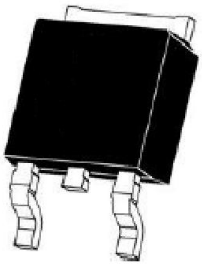
Feature

- 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

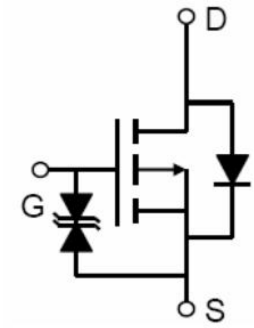
- Power switching application
- Hard switched and high frequency circuits
- Uninterruptible power supply

Package

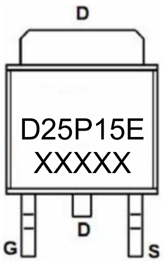


TO-252AB

Circuit diagram



Marking



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

Parameter	Symbol	Value	Unit
Drain-Source Voltage	V_{DS}	-145	V
Gate-Source Voltage	V_{GS}	±20	V
Continuous Drain Current	I_D	-25	A
Pulsed Drain Current	I_{DM}	-140	A
Power Dissipation	P_D	160	W
Thermal Resistance,Junction-to-Case	$R_{\theta JC}$	0.8	℃/W
Junction Temperature	T_J	150	℃
Storage Temperature	T_{STG}	-55 ~ +150	℃

Electrical characteristics (T_A=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	-145			V
Zero gate voltage drain current	I_{DSS}	V_{DS} =-145V,V_{GS} = 0V			-1	μA
Gate-body leakage current	I_{GSS}	V_{GS} =±20V, V_{DS} = 0V			±10	μA
Gate threshold voltage	$V_{GS(th)}$	V_{DS} =V_{GS}, I_D =-250μA	-1.5		-3	V
Drain-source on-resistance[1]	$R_{DS(on)}$	V_{GS} =-10V, I_D =-20A		123	150	mΩ
		V_{GS} =-4.5V, I_D =-20A		133	160	mΩ
Forward transconductance[1]	g_{FS}	V_{DS} =-5V, I_D =-20A	5			S
Dynamic characteristics[2]						
Input Capacitance	C_{iss}	V_{DS} =-75V,V_{GS} =0V,f =1MHz		7650		pF
Output Capacitance	C_{oss}			148		
Reverse Transfer Capacitance	C_{rss}			130		
Total Gate Charge	Q_g	V_{DS} =-75V,V_{GS} =-10V, ID =-20A		137		nC
Gate-Source Charge	Q_{gs}			25		
Gate-Drain Charge	Q_{gd}			28		
Turn-on delay time	$t_{d(on)}$	V_{DD}=-75V,V_{GS}=-10V, I_D =-20A,R_{GEN}=9.1Ω		17		nS
Turn-on rise time	t_r			80		
Turn-off delay time	$t_{d(off)}$			45		
Turn-off fall time	t_f			65		
Source-Drain Diode characteristics						
Diode Forward Current[1]	I_S				-25	A
Diode Forward voltage	V_{DS}	V_{GS} =0V, I_S=-25A			-1.2	V
Reverse Recovery Time	t_{rr}	TJ = 25°C, IF =-25A di/dt = 100A/μs [1]		90		nS
Reverse Recovery Charge	Q_{rr}			105		nC

Notes:

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

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

Typical Characteristics

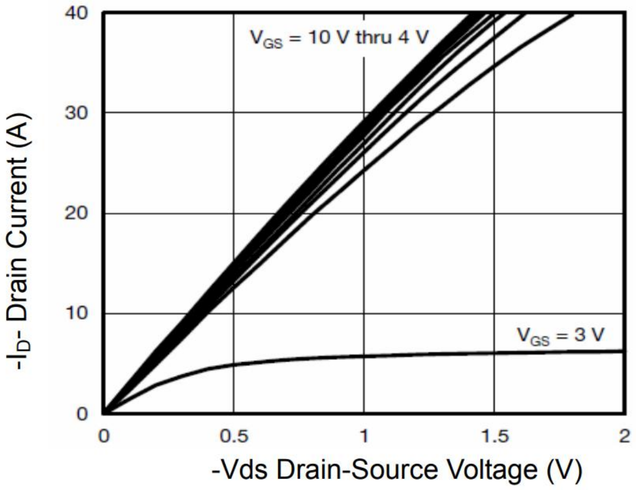


Figure 1 Output Characteristics

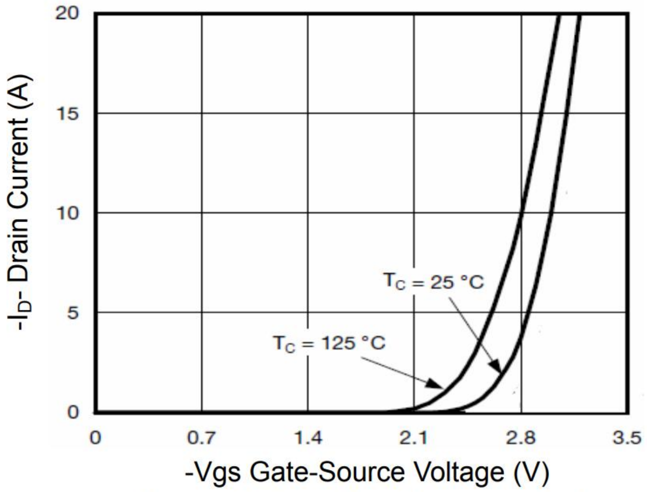


Figure 2 Transfer Characteristics

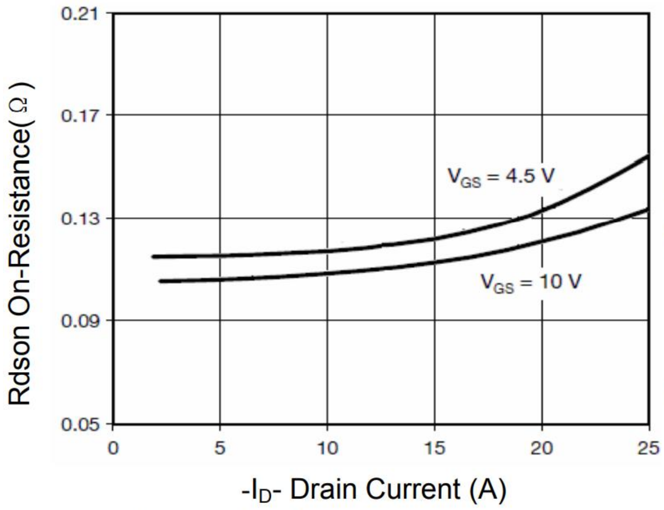


Figure 3 Rdson- Drain Current

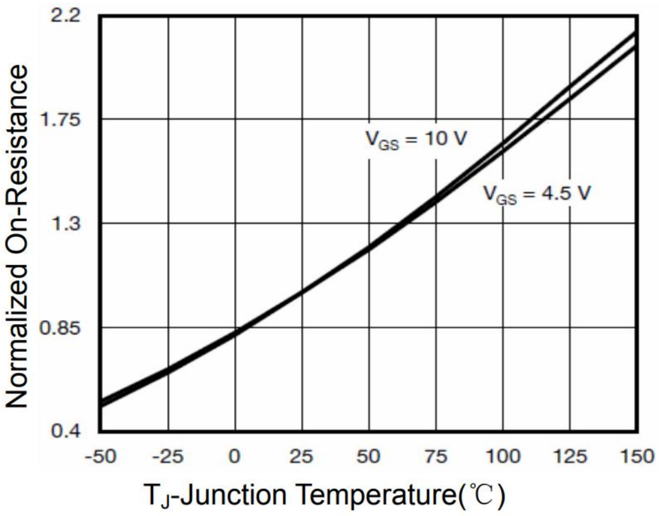


Figure 4 Rdson-JunctionTemperature

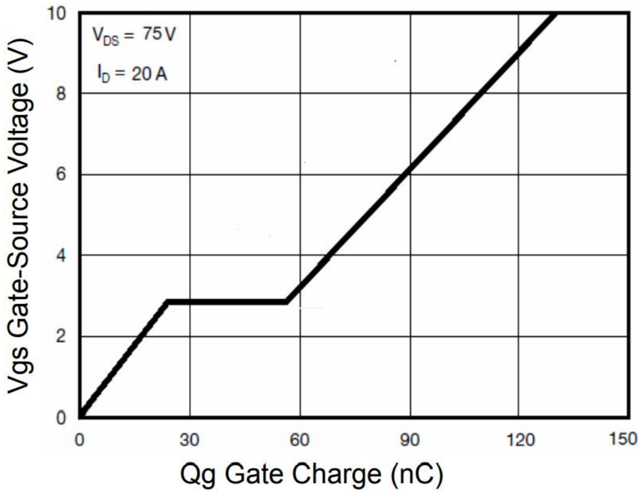


Figure 5 Gate Charge

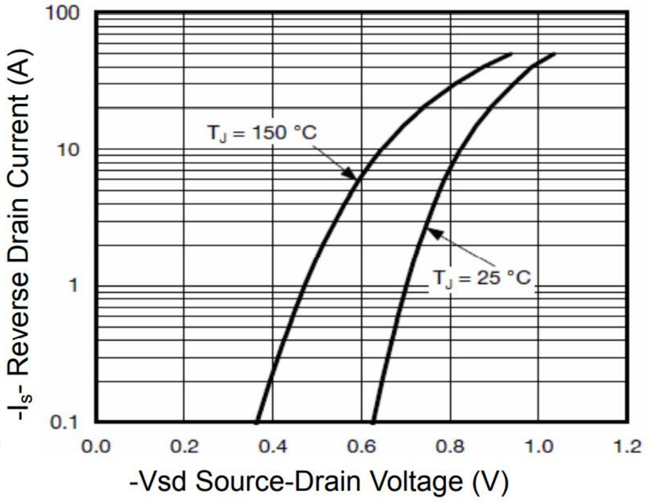


Figure 6 Source- Drain Diode Forward

Typical Characteristics

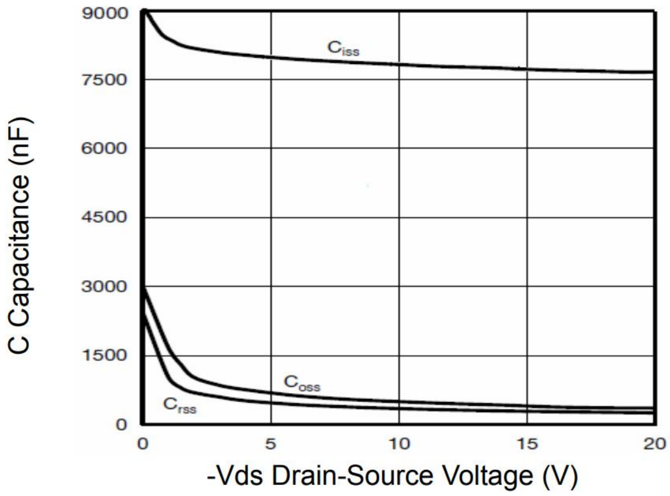


Figure 7 Capacitance vs Vds

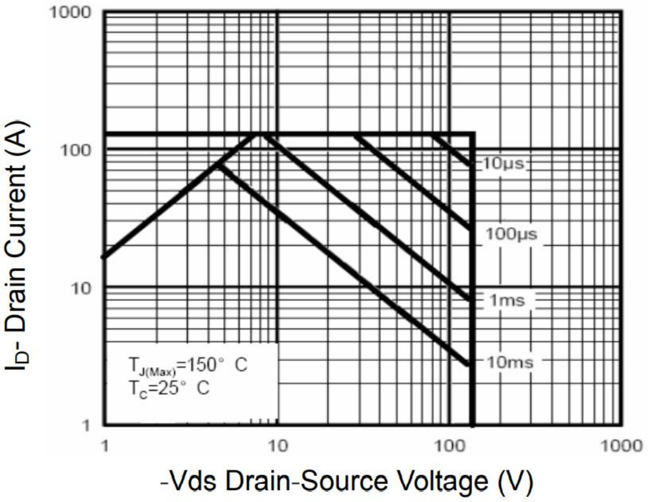


Figure 8 Safe Operation Area

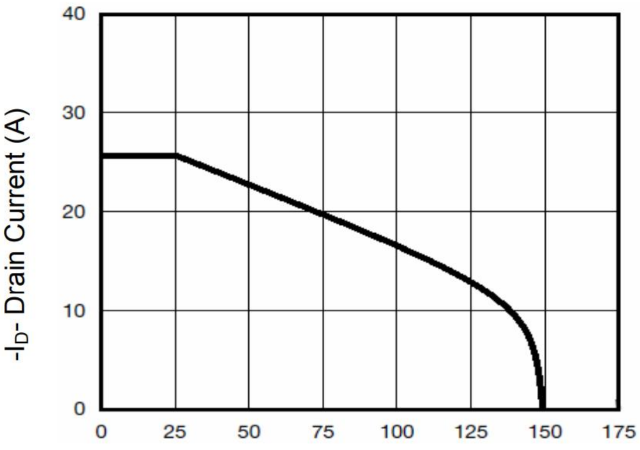


Figure 9 Drain Current vs Case Temperature

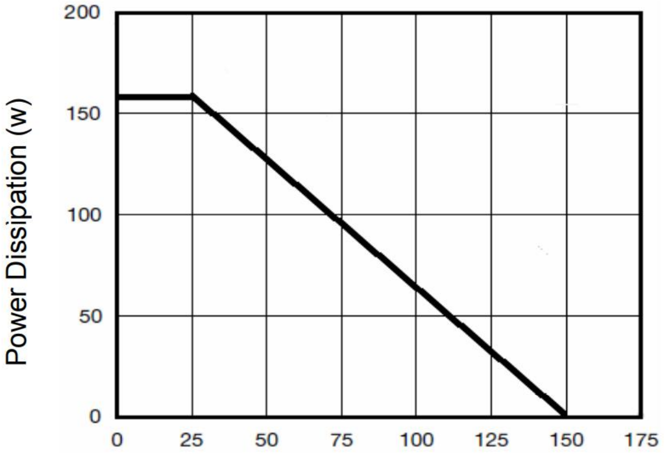


Figure 10 Power De-rating

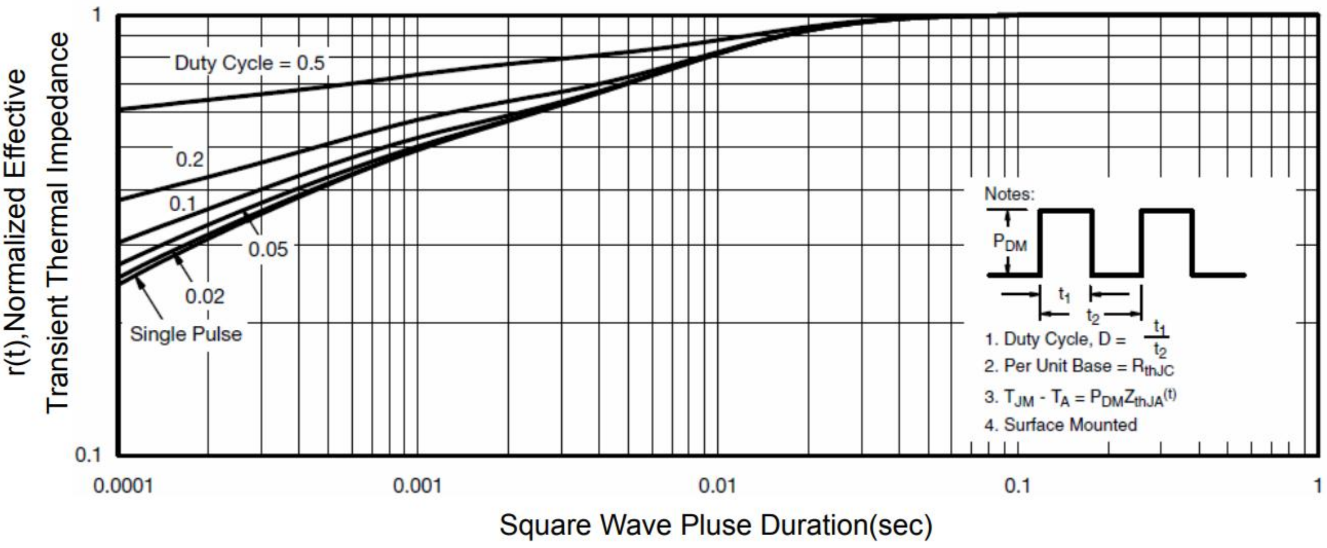
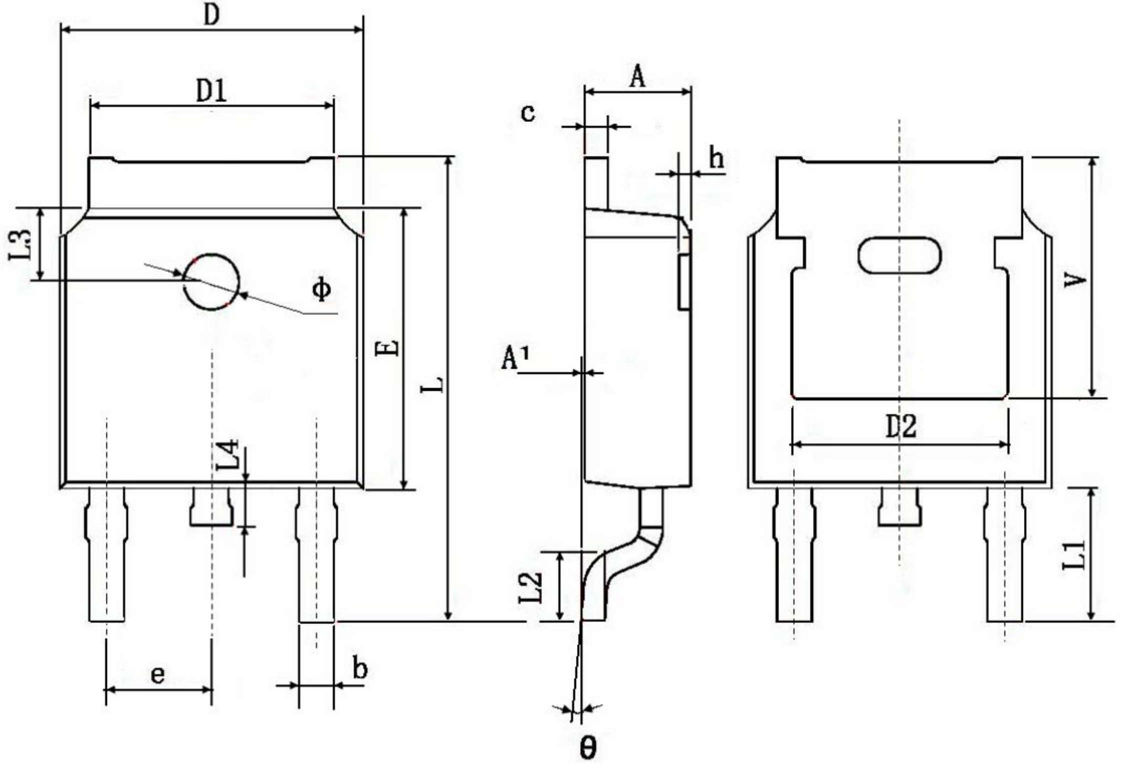


Figure 11 Normalized Maximum Transient Thermal Impedance

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	0.127	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	5.460	0.201	0.215
D2	4.830 TYP.		0.190 TYP.	
E	6.000	6.200	0.236	0.244
e	2.186	2.386	0.086	0.094
L	9.800	10.400	0.386	0.409
L1	2.900 TYP.		0.114 TYP.	
L2	1.400	1.700	0.055	0.067
L3	1.600 TYP.		0.063 TYP.	
L4	0.600	1.000	0.024	0.039
Φ	1.100	1.300	0.043	0.051
θ	0°	8°	0°	8°
h	0.000	0.300	0.000	0.012
V	5.350 TYP.		0.211 TYP.	