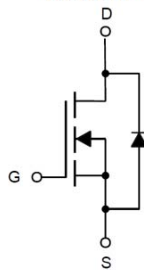


Top View

Bottom View

TO-252



D	90A
$R_{DS(on)}$ (at $V_{GS}=10V$)	4.5m
$R_{DS(on)}$ (at $V_{GS}=4.5V$)	8.0m
100% EAS Tested	
100% V_{DS} Tested	

General Description

- Low $R_{DS(on)}$ & FOM
- Extremely low switching loss
- Excellent stability and uniformity
- Fast switching and soft recovery
- Moisture Sensitivity Level 1
- Part no. with suffix "Q" means AEC-Q101 qualified

Applications

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

Absolute Maximum Ratings ($T_A=25$ unless otherwise noted)

Parameter		Symbol	Limit	Unit
Drain-source Voltage		V_{DS}	60	V
Gate-source Voltage		V_{GS}	± 20	V
Drain Current	$T_A=25$	I_D	20	A
	$T_A=100$		14	
	$T_C=25$		90	
	$T_C=100$		64	
Pulsed Drain Current ^A		I_{DM}	360	A
Avalanche energy ^B		EAS	144	mJ
Total Power Dissipation ^C	$T_A=25$	P_D	3	W
	$T_A=100$		1.5	
	$T_C=25$		125	
	$T_C=100$		62	
Junction and Storage Temperature Range		T_J, T_{STG}	-55 +175	



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Thermal resistance

Parameter		Symbol	Typ	Max	Units
Thermal Resistance Junction-to-Ambient ^D	Steady-State	R_{JA}	35	42	/W
Thermal Resistance Junction-to-Case	Steady-State	R_{JC}	1	1.2	

Ordering Information (Example)

PREFERRED P/N	PACKING CODE	Marking	MINIMUM PACKAGE(pcs)	INNER BOX QUANTITY(pcs)	OUTER CARTON QUANTITY(pcs)	DELIVERY MODE
YJD90G06AQ	F1	YJD90G06A	2500	/	25000	13"Reel

A. Repetitive rating; pulse width limited by max. junction temperature.

B. $T_J=25$, $V_{DD}=40V$, $V_G=10V$, $R_G=25$, $L=1mH$, $I_{AS}=17A$.

C. P_q is based on max. junction temperature, using junction-case thermal resistance.

D. The value of R_{JA} is measured with the device mounted on the minimum recommend pad size, in the still air environment with $T_A=25$.
The maximum allowed junction temperature of 175 . The value in any given application depends on the user's specific board design.



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Electrical Characteristics (T_J=25 unless otherwise noted)

Parameter	Symbol	Conditions	Min	Typ	Max	Units
Static Parameter						
Drain-Source Breakdown Voltage	BV _{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	V _{GS(th)}	V _{DS} = V _{GS} , I _D =250μA	1.0	1.7	2.5	V
Static Drain-Source On-Resistance	R _{DS(on)}	V _{GS} =10V, I _D =20A		3.6	4.5	m
		V _{GS} =4.5V, I _D =10A		5.3	8	
Diode Forward Voltage	V _{SD}	I _S =20A, V _{GS} =0V		0.85	1.2	V
Maximum Body-Diode Continuous Current	I _S				90	A
Gate resistance	R _G	f=1MHz		1.5		
Dynamic Parameters						
Input Capacitance	C _{iss}	V _{DS} =25V, V _{GS} =0V, f=1MHz	-	1775	-	pF
Output Capacitance	C _{oss}		-	760	-	
Reverse Transfer Capacitance	C _{rss}		-	56	-	
Switching Parameters						
Total Gate Charge	Q _g	V _{GS} =10V, V _{DS} =30V, I _D =30A	-	38.5	-	nC
Gate-Source Charge	Q _{gs}		-	9	-	
Gate-Drain Charge	Q _{gd}		-	8.2	-	
Reverse Recovery Charge	Q _{rr}	I _F =20A, di/dt=100A/us	-	31.5	-	nC
Reverse Recovery Time	t _{rr}		-	37	-	ns
Turn-on Delay Time	t _{D(on)}	V _{GS} =10V, V _{DD} =30V, I _{DS} =10A, R _G =3	-	14.2	-	ns
Turn-on Rise Time	t _r		-	54.6	-	
Turn-off Delay Time	t _{D(off)}		-	28	-	
Turn-off fall Time	t _f		-	10.5	-	



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Typical Electrical and Thermal Characteristics Diagrams

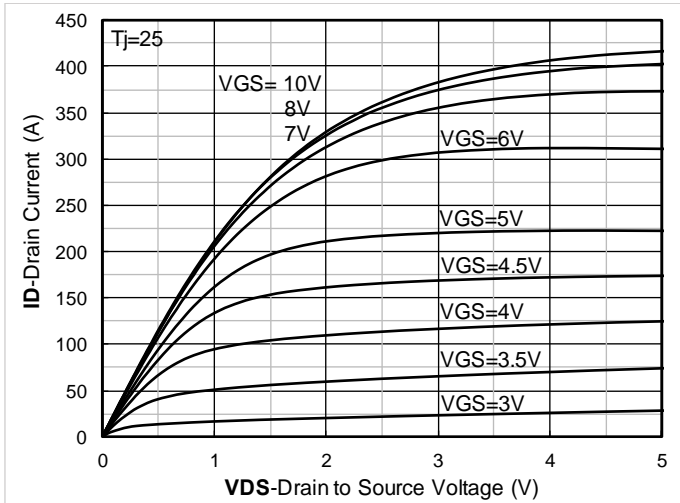


Figure 1. Output Characteristics

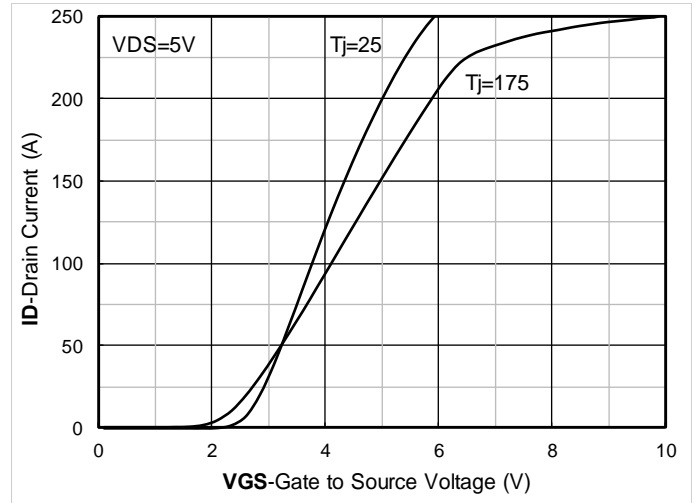


Figure 2. Transfer Characteristics

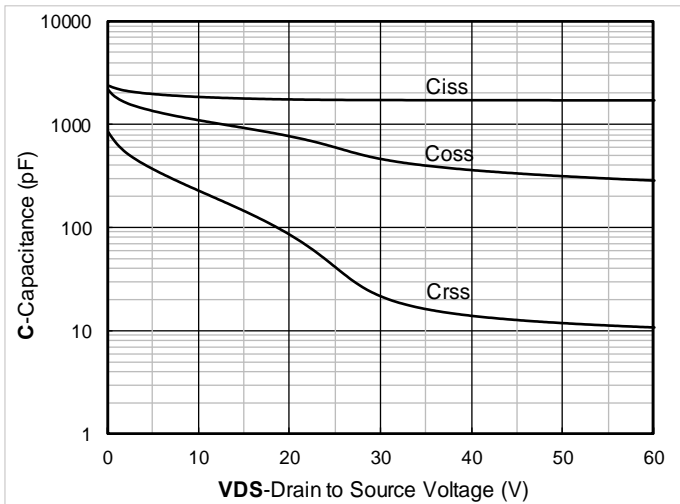


Figure 3. Capacitance Characteristics

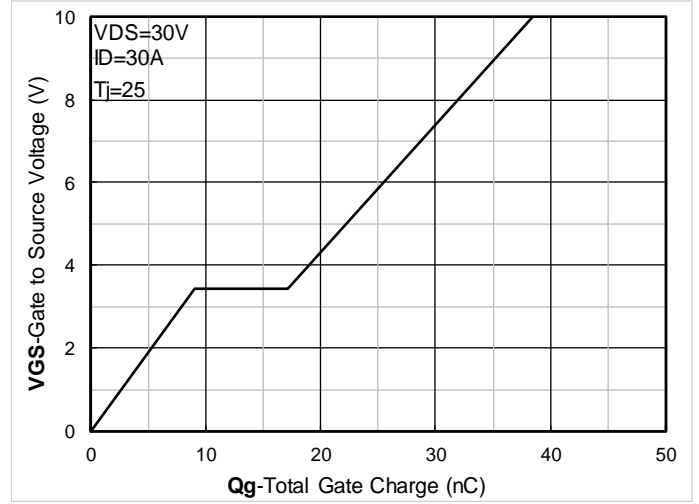


Figure 4. Gate Charge

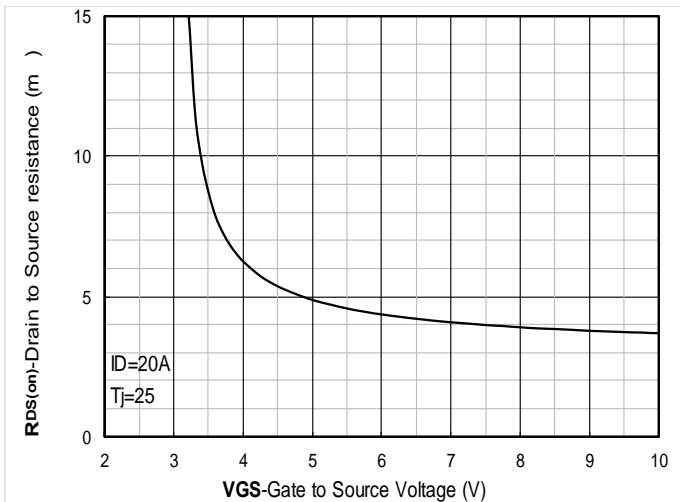


Figure 5. On-Resistance vs Gate to Source Voltage

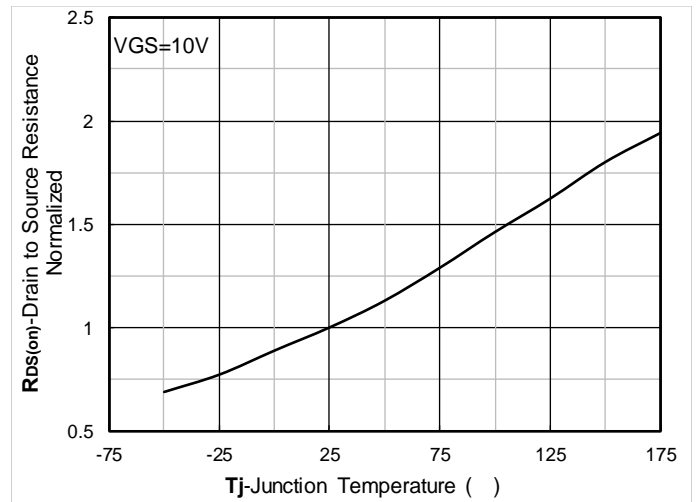


Figure 6. Normalized On-Resistance



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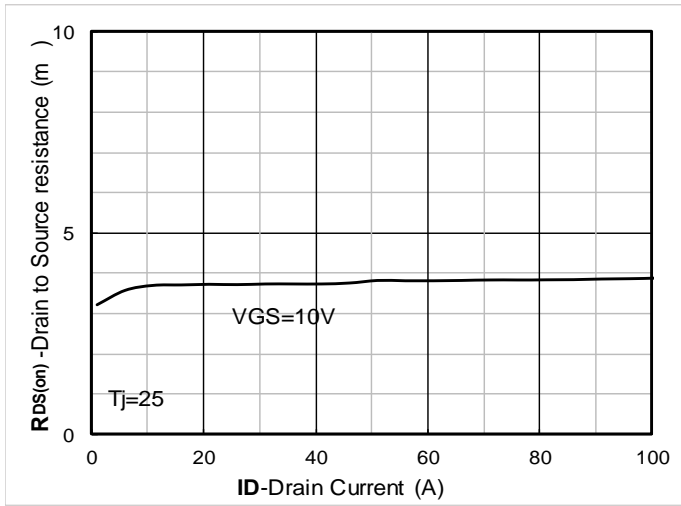


Figure 7. RDS(on) VS Drain Current

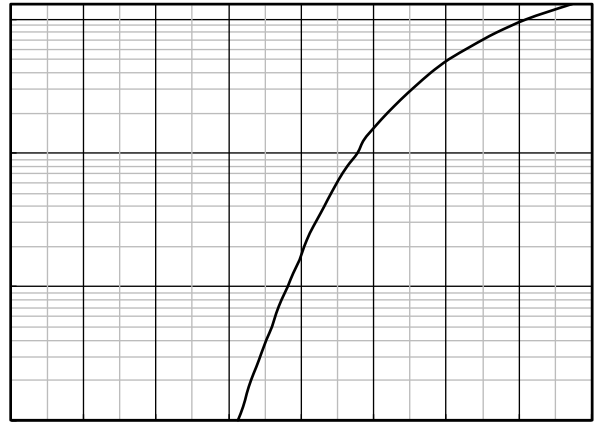


Figure 8. Forward characteristics of reverse diode

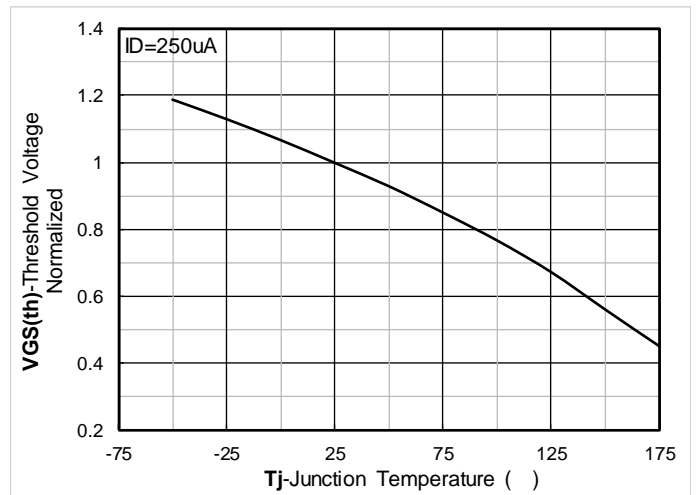


Figure 9. Normalized breakdown voltage

Figure 10. Normalized Threshold voltage

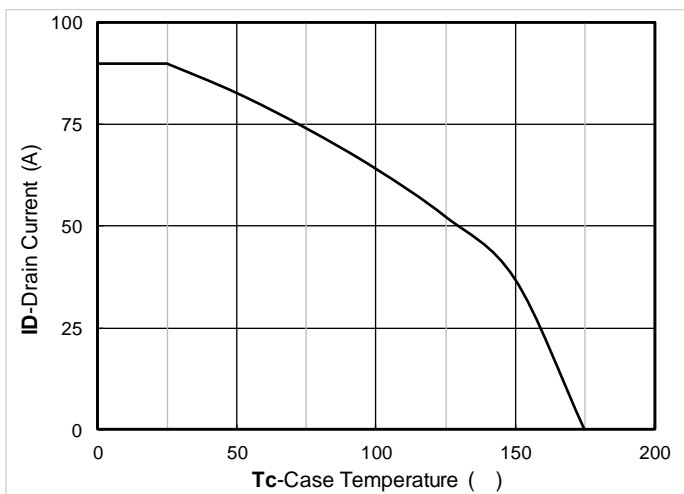


Figure 11. Current dissipation

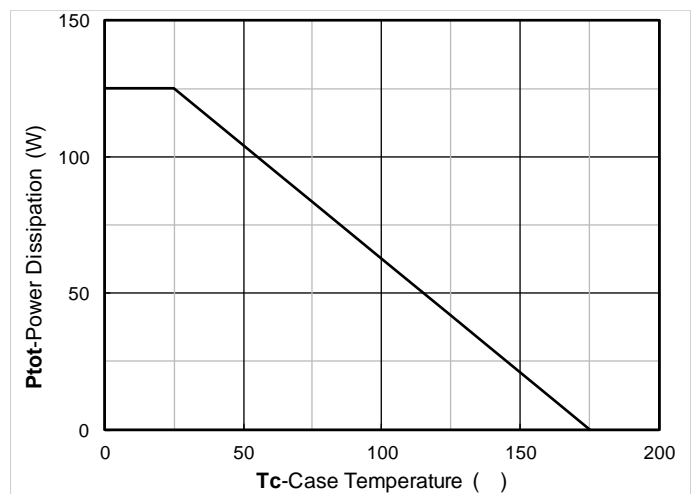


Figure 12. Power dissipation



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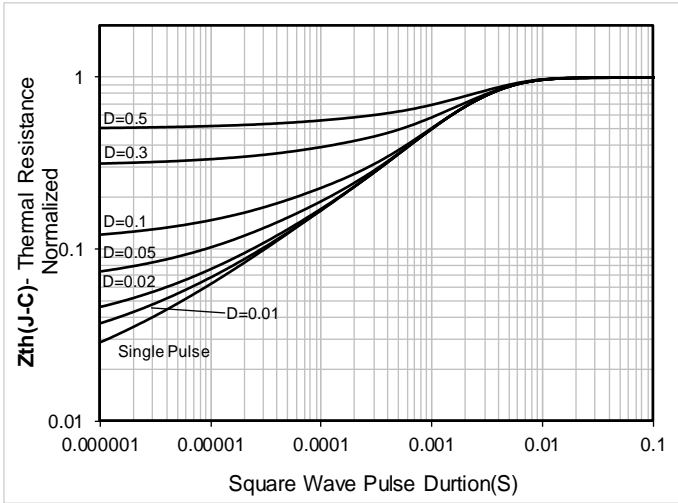


Figure 13. Maximum Transient Thermal Impedance

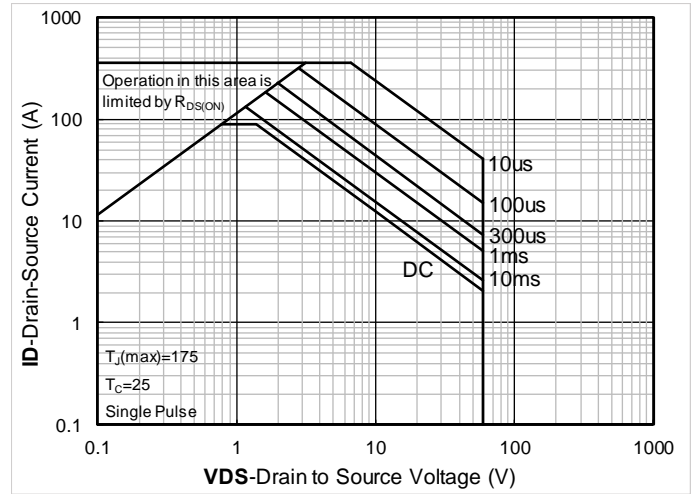


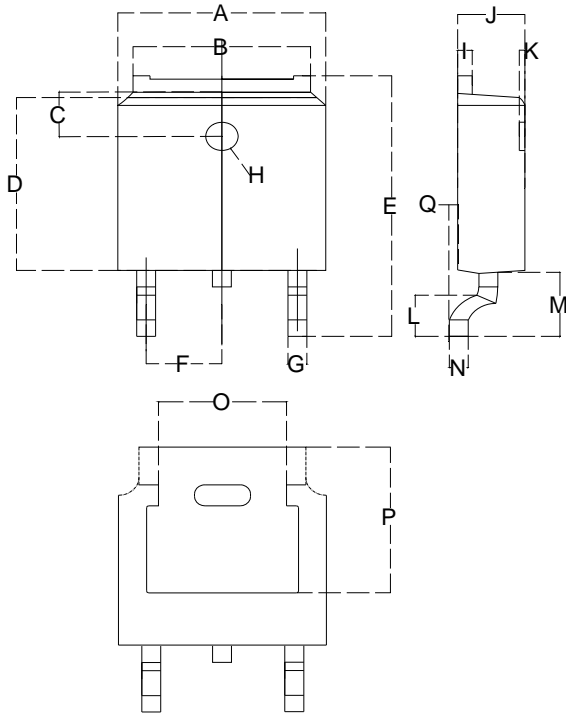
Figure 14. Safe Operation Area



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TO-252 Package information

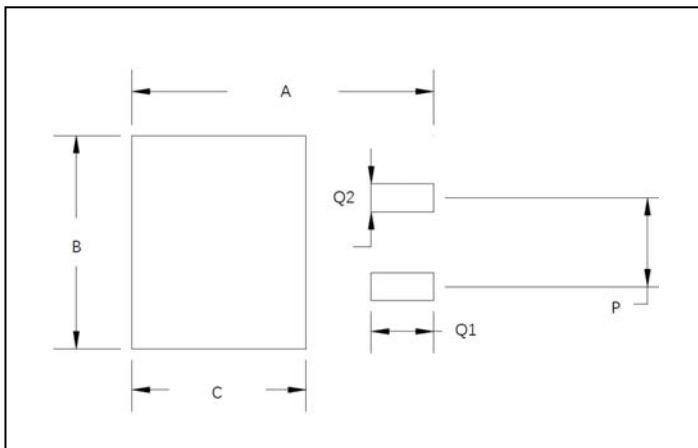
TO-252



TO-252		
Dim	Min	Max
A	6.500	6.700
B	5.100	5.460
C	1.400	1.800
D	6.000	6.200
E	10.000	10.400
F	2.166	2.366
G	0.660	0.860
H	1.050	1.350
I	0.460	0.580
J	2.200	2.400
K	0	0.300
L	0.890	2.290
M	2.730	3.080
N	0.430	0.580
O	4.20	4.95
P	5.15	5.45
Q	0	0.2

Dimensions in millimeters

Suggested Pad Layout



Dim	Millimeters
A	11.4
B	6.74
C	6.23
P	4.56
Q1	2.28
Q2	1.52



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