

General Features

- Low Gate Charge
- Advanced Trench Technology
- Provide Excellent RDS(ON)
- High Power and Current Handling Capability

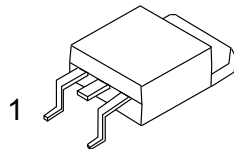
Application

- Load Switch
- PWM applications
- Power management

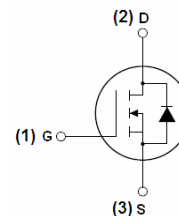
Product Summary



VDS	30	V
RDS(on), Typ. @ VGS=10 V	3.0	mΩ
ID	90	A



TO-252



N-channel

Absolute Maximum Ratings (T_A =25°C unless otherwise noted)

Parameter	Symbol	Maximum	Units
Drain-Source Voltage	V _{DS}	30	V
Gate-Source Voltage	V _{GS}	±20	V
Continuous Drain Current ^B	I _D	T _C =25°C	90
		T _C =100°C	46
Pulsed Drain Current ^A	I _{DM}	255	A
Avalanche Current ^A	I _S	90	A
Single Pulse Avalanche Energy L =0.3mH ^A	E _{AS}	135	mJ
Power Dissipation ^C	P _D	T _C =25°C	65
		T _C =100°C	32
Junction and Storage Temperature Range	T _J , T _{STG}	-55 to 175	°C
Thermal Characteristics			
Parameter	Symbol	Maximum	Units
Maximum Junction-to-Case	R _{θJC}	2.3	°C/W
Maximum Junction-to-Ambient	R _{θJA}	100	

Electrical Characteristics($T_J = 25^\circ\text{C}$ unless otherwise noted)							
Symbol	Parameter	Conditions	Value			Units	
			Min	Typ	Max		
STATIC PARAMETERS							
BV_{DSS}	Drain-Source Breakdown Voltage	$I_D = 250\mu\text{A}, V_{GS} = 0\text{V}$	30	--	--	V	
I_{DSS}	Zero Gate Voltage Drain Current	$V_{DS} = 30\text{V}, V_{GS} = 0\text{V}$	$T_J = 25^\circ\text{C}$	--	--	1	μA
			$T_J = 125^\circ\text{C}$	--	--	25	
I_{GSS}	Gate-Body Leakage Current	$V_{DS} = 0\text{V}, V_{GS} = \pm 20\text{V}$	--	--	± 100	nA	
$V_{GS(th)}$	Gate Threshold Voltage	$V_{DS} = V_{GS}, I_D = 250\mu\text{A}$	1	1.7	2.4	V	
$R_{DS(on)}$	Static Drain-Source On-Resistance	$V_{GS} = 10\text{V}, I_D = 30\text{A}$	--	3.0	4.5	$\text{m}\Omega$	
		$V_{GS} = 4.5\text{V}, I_D = 30\text{A}$	--	4.8	6.5	$\text{m}\Omega$	
g_{FS}	Forward Transconductance	$V_{DS} = 10\text{V}, I_D = 20\text{A}$	16	--	--	S	
V_{SD}	Diode Forward Voltage	$I_S = 30\text{A}, V_{GS} = 0\text{V}$	--	--	1	V	
I_S	Maximum Body-Diode Continuous Current ^B		--	--	90	A	
DYNAMIC PARAMETERS							
C_{iss}	Input Capacitance	$V_{GS} = 0\text{V}, V_{DS} = 15\text{V}, f = 1\text{MHz}$	--	2120	--	pF	
C_{oss}	Output Capacitance		--	307	--		
C_{rss}	Reverse Transfer Capacitance		--	253	--		
SWITCHING PARAMETERS							
Q_g	Total Gate Charge	$V_{GS} = 10\text{V}, V_{DS} = 15\text{V}, I_D = 30\text{A}$	--	40	--	nC	
Q_{gs}	Gate Source Charge		--	5.4	--		
Q_{gd}	Gate Drain Charge		--	9.6	--		
$t_{D(on)}$	Turn-On Delay Time	$V_{GS} = 10\text{V}, V_{DS} = 15\text{V}, I_D = 20\text{A}, R_G = 3\Omega$	--	15	--	ns	
t_r	Turn-On Rise Time		--	32	--		
$t_{D(off)}$	Turn-Off Delay Time		--	15	--		
t_f	Turn-Off Fall Time		--	12	--		
t_{rr}	Body Diode Reverse Recovery Time	$I_F = 30\text{A}, di/dt = 100\text{A}/\mu\text{s}$	--	23	--	ns	
Q_{rr}	Body Diode Reverse Recovery Charge		--	48	--	nC	

A. Single pulse width limited by maximum junction temperature.

B. The maximum current rating is package limited.

C. The power dissipation P_D is based on $T_{J(MAX)} = 175^\circ\text{C}$, using junction-to-case thermal resistance, and is more useful in setting the upper dissipation limit for cases where additional heatsinking is used.

Typical Characteristics $T_J = 25^\circ\text{C}$, unless otherwise noted

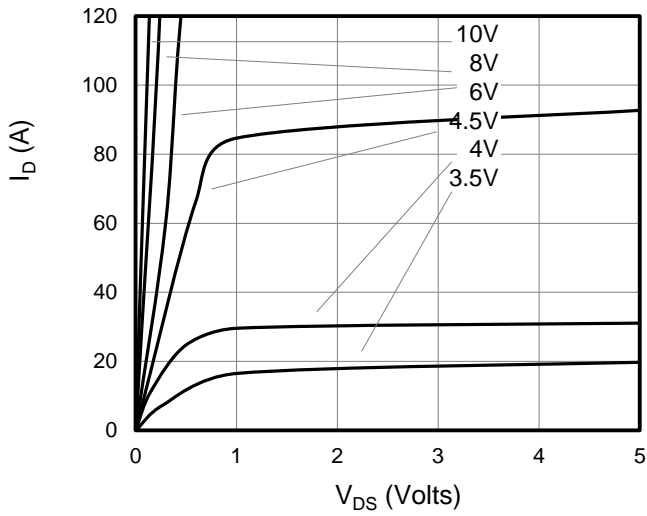


Figure 1: On-Region Characteristics

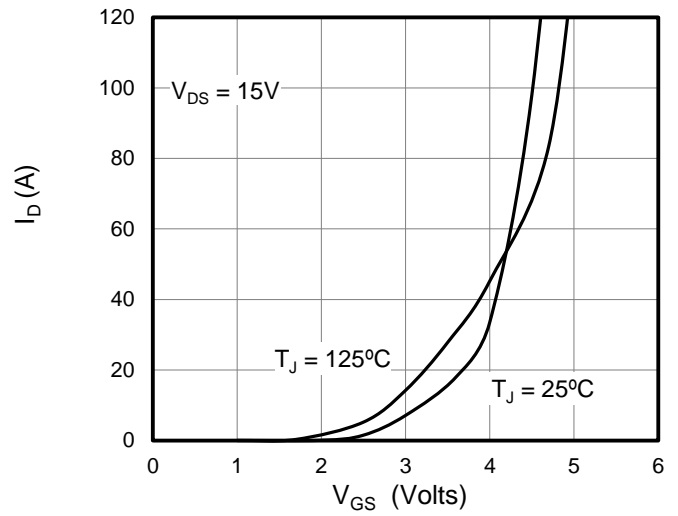


Figure 2: Transfer Characteristics

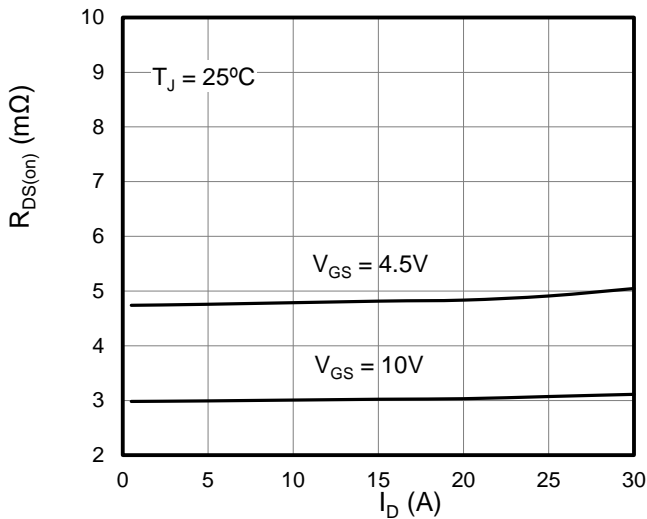


Figure 3: On-Resistance vs. Drain Current

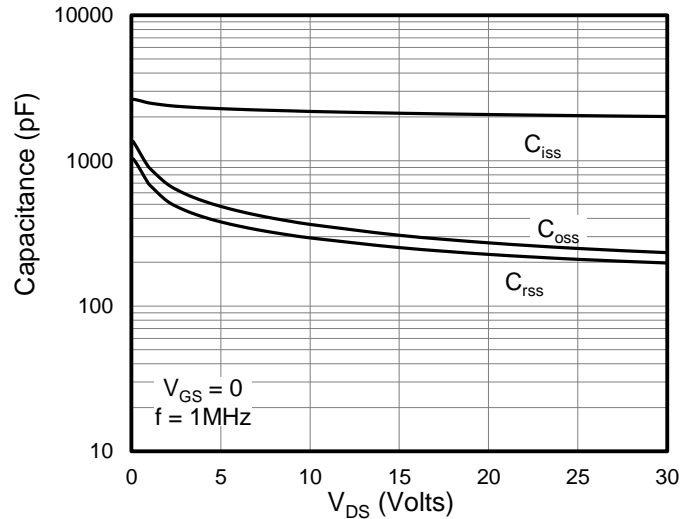


Figure 4: Capacitance Characteristics

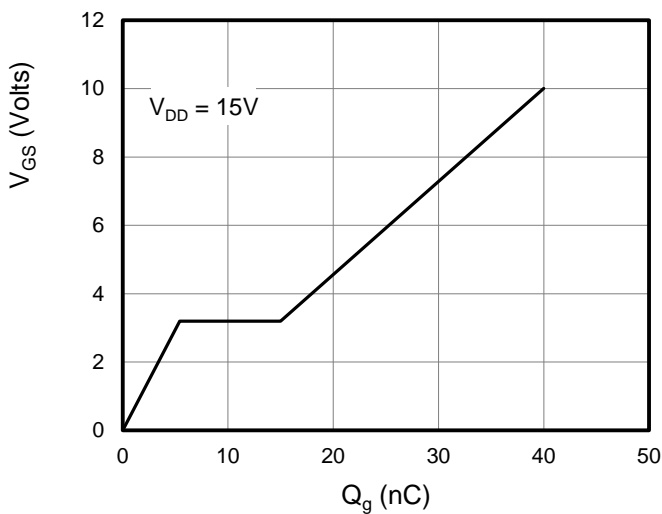


Figure 5: Gate Charge Characteristics

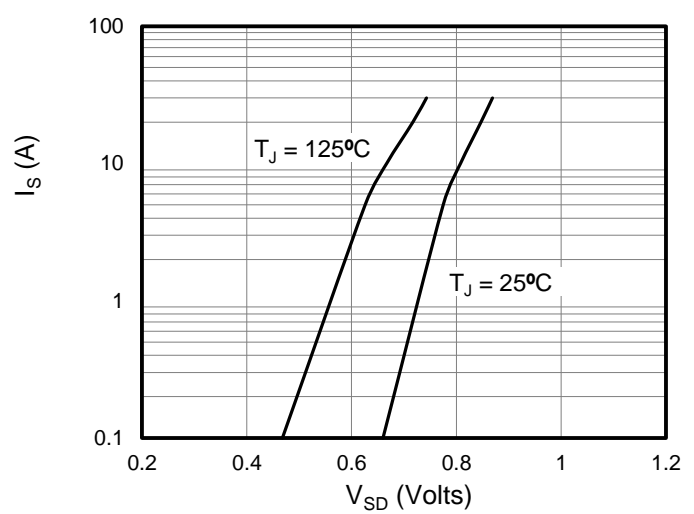


Figure 6: Body Diode Forward Voltage

Typical Characteristics $T_J = 25^\circ\text{C}$, unless otherwise noted

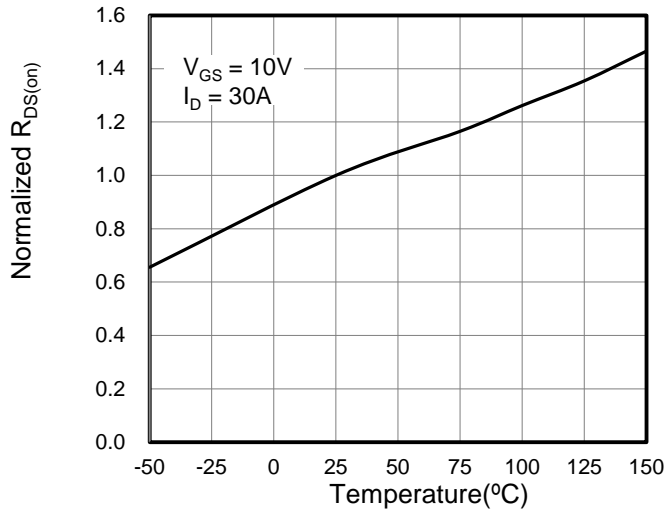


Figure 7: On-Resistance vs. Junction Temperature

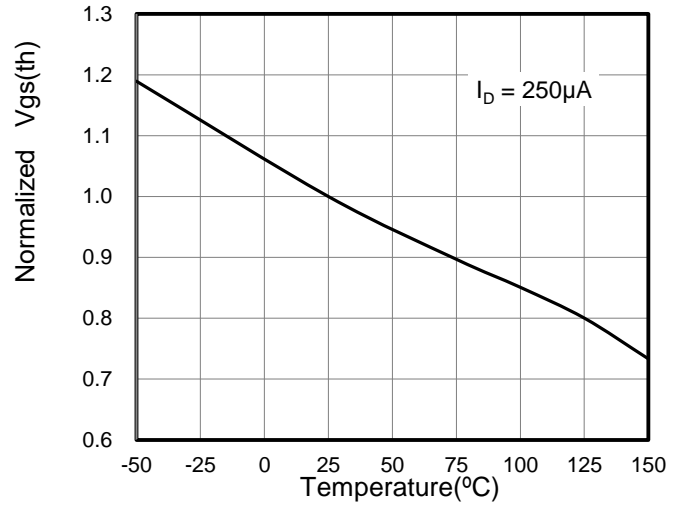


Figure 8: $V_{GS(th)}$ vs. Junction Temperature

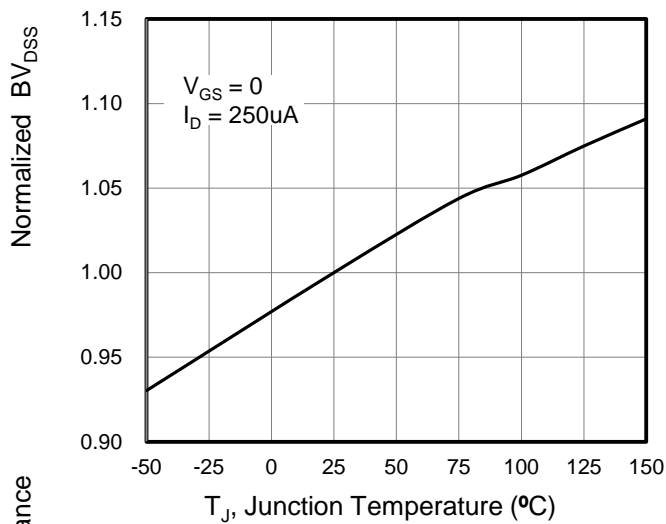


Figure 9: BV_{DS} vs. Junction Temperature

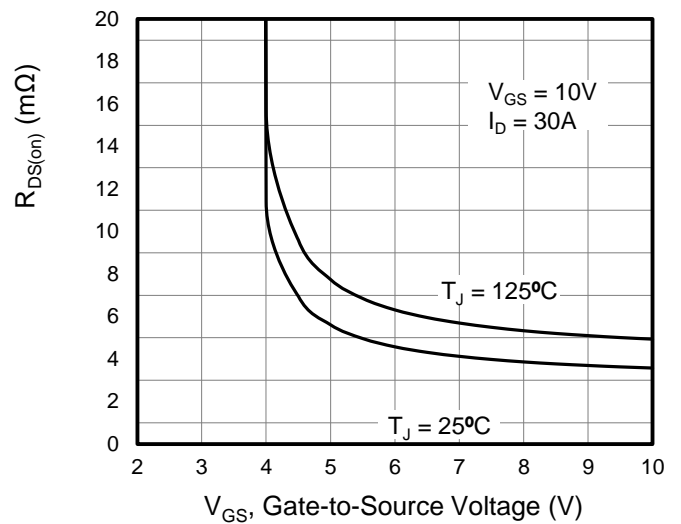


Figure 10: On-Resistance vs. Gate-Source Voltage

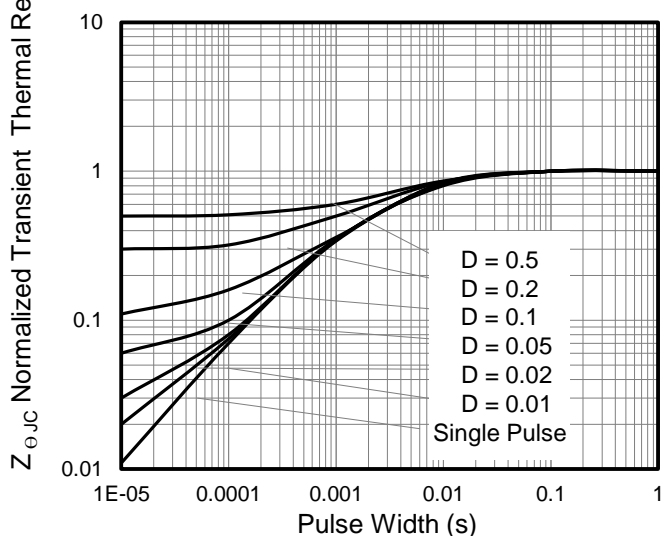


Figure 11: Normalized Transient Thermal Resistance

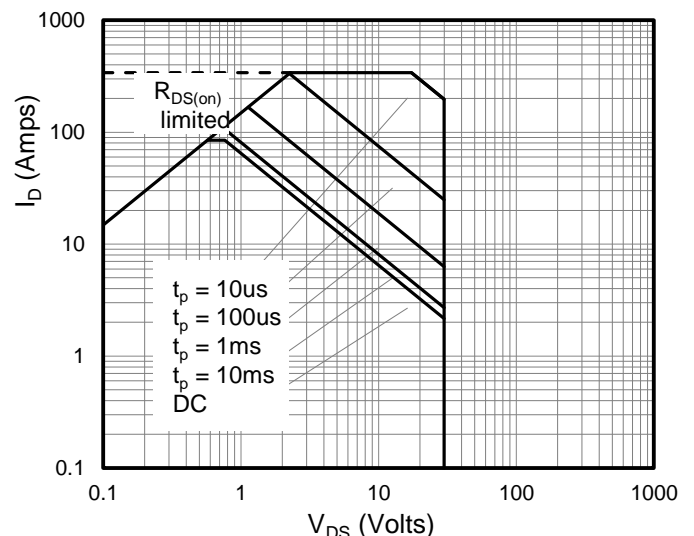
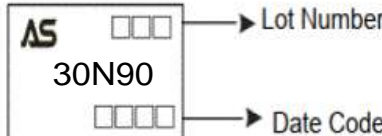
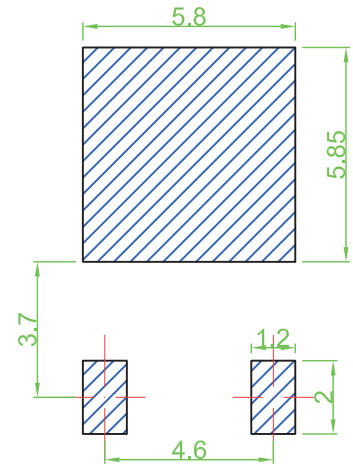
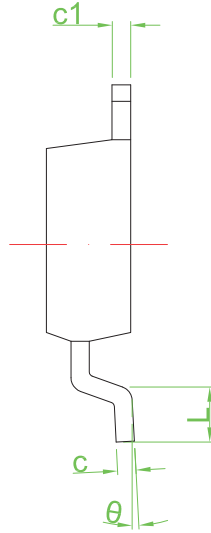
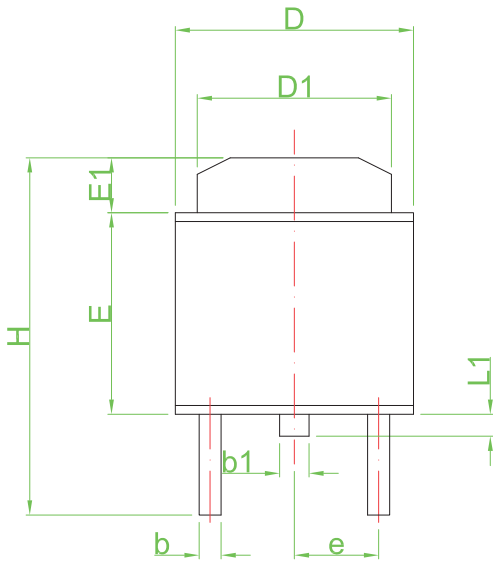
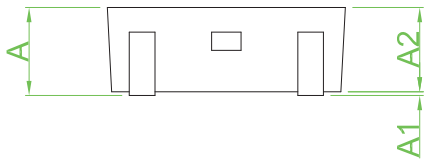


Figure 12: Safe Operating Area

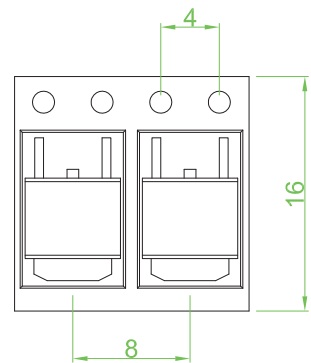
Ordering and Marking Information

Ordering Device No.	Marking	Package	Packing	Quantity
ASDM30N90KQ-R	30N90	TO-252	Tape&Reel	2500/Reel

PACKAGE	MARKING
TO-252	 <p>AS □□</p> <p>30N90</p> <p> □□□□</p> <p> → Lot Number</p> <p> → Date Code</p>

TO-252 PACKAGE IN FORMATION

Recommended Land Pattern


Symbol	Dimensions in Millimeters		Dimensions in Inches	
	Min	Max	Min	Max
A	2.25	2.65	0.089	0.104
A1	0.00	0.15	0.000	0.006
A2	2.20	2.40	0.087	0.094
b	0.50	0.70	0.020	0.028
b1	0.70	0.90	0.028	0.035
c	0.46	0.66	0.018	0.026
c1	0.46	0.66	0.018	0.026
D	6.30	6.70	0.248	0.264
D1	5.20	5.40	0.205	0.213
E	5.30	5.70	0.209	0.224
E1	1.40	1.60	0.055	0.063
H	9.40	9.90	0.370	0.390
e	2.30 TYP		0.09 TYP	
L	1.40	1.77	0.055	0.070
L1	0.50	0.70	0.020	0.028
θ	0°	8°	0°	8°



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