ASDM30N90KQ

30V N-Channel MOSFET

General Features

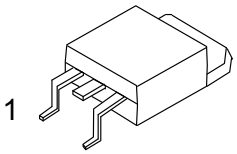
- Low Gate Charge
- Advanced Trench Technology
- Provide Excellent RDS(ON)
- High Power and Current Handling Capability

Product Summary

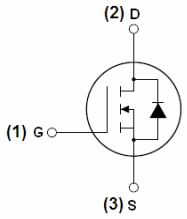
VDS	30	V
RDS(on),Typ.@ VGS=10 V	3.6	mΩ
ID	90	A

Application

- Load Swtich
- PWM applications
- Power management



TO-252



N-channel

Absolute Maximum Ratings (T_A =25ºC 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	T_C =25ºC	I_D	90	A
	T_C =100ºC		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	T_C =25ºC	P_D	65	W
	T_C =100ºC		32	W
Junction and Storage Temperature Range		T_J, T_{STG}	-55 to 175	ºC

Thermal Characteristics

Parameter		Symbol	Maximum	Units
Maximum Junction-to-Case	Steady-State	$R_{\theta JC}$	2.3	ºC/W
Maximum Junction-to-Ambient	Steady-State	$R_{\theta JA}$	100	

Electrical Characteristics(T_J =25ºC unless otherwise noted)

Symbol	Parameter	Conditions		Value			Units
				Min	Typ	Max	
STATIC PARAMETERS							
BV_{DSS}	Drain-Source Breakdown Voltage	I_D =250μA,V_{GS} =0V		30	--	--	V
I_{DSS}	Zero Gate Voltage Drain Current	V_{DS} =30V, V_{GS} =0V	T_J =25ºC	--	--	1	μA
			T_J =125ºC	--	--	25	
I_{GSS}	Gate-Body Leakage Current	V_{DS} =0V, V_{GS} =±20V		--	--	±100	nA
$V_{GS(th)}$	Gate Threshold Voltage	V_{DS} =V_{GS}, I_D =250μA		1	1.6	2.4	V
$R_{DS(ON)}$	Static Drain-Source On-Resistance	V_{GS} =10V, I_D =30A		--	3.6	4.5	mΩ
		V_{GS} =4.5V, I_D =30A		--	6.9	9.0	mΩ
g_{FS}	Forward Transconductance	V_{DS} =10V, I_D =20A		16	--	--	S
V_{SD}	Diode Forward Voltage	I_S =30A, V_{GS} =0V		--	--	1	V
I_S	Maximum Body-Diode Continuous Current [B]			--	--	90	A
DYNAMIC PARAMETERS							
C_{iss}	Input Capacitance	V_{GS} =0V, V_{DS} =15V, f =1MH_Z		--	2120	--	pF
C_{oss}	Output Capacitance			--	307	--	
C_{rss}	Reverse Transfer Capacitance			--	253	--	
SWITCHING PARAMETERS							
Q_g	Total Gate Charge	V_{GS} =10V,V_{DS} =15V, I_D =30A		--	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} =10V,V_{DS} =15V, I_D =20A, R_G =3Ω		--	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 =30A, di/dt =100A/μs		--	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 $T_{J(MAX)}$ =175ºC, 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 = 25ºC, unless otherwise noted

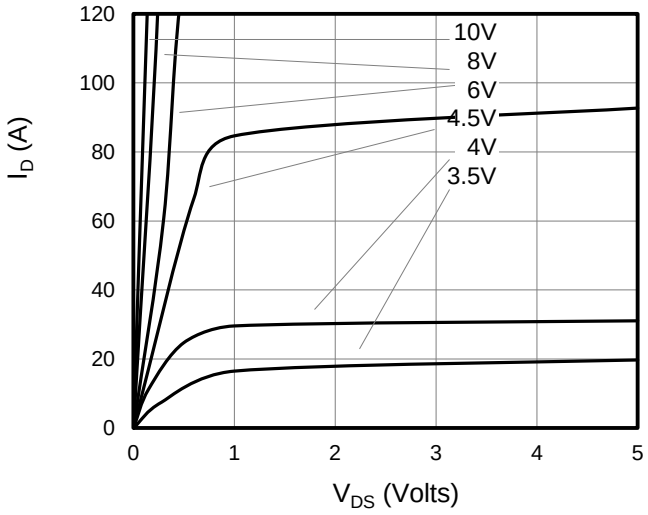


Figure 1: On-Region Characteristics

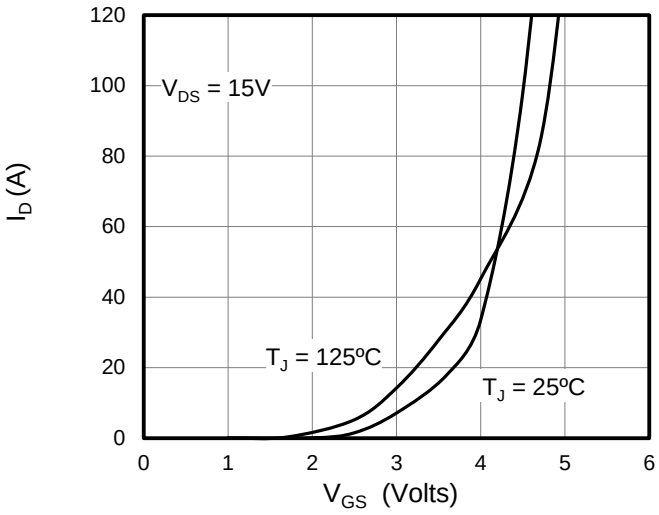


Figure 2: Transfer Characteristics

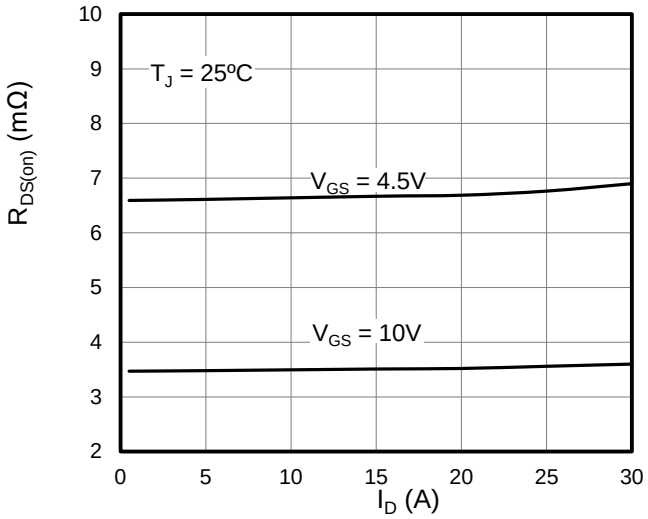


Figure 3: On-Resistance vs. Drain Current

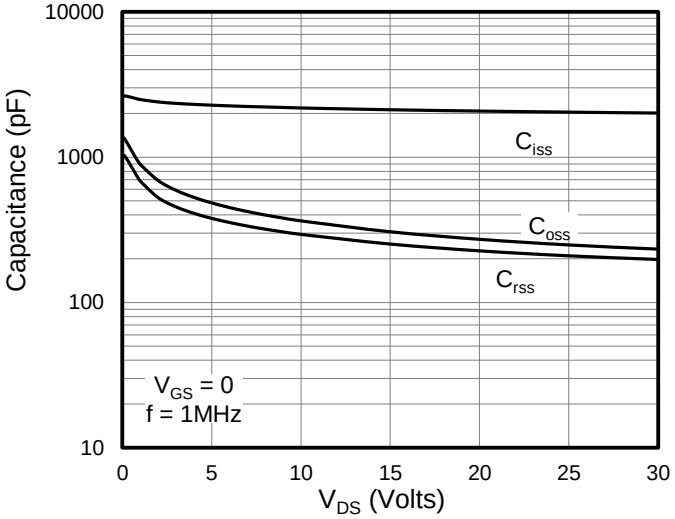


Figure 4: Capacitance Characteristics

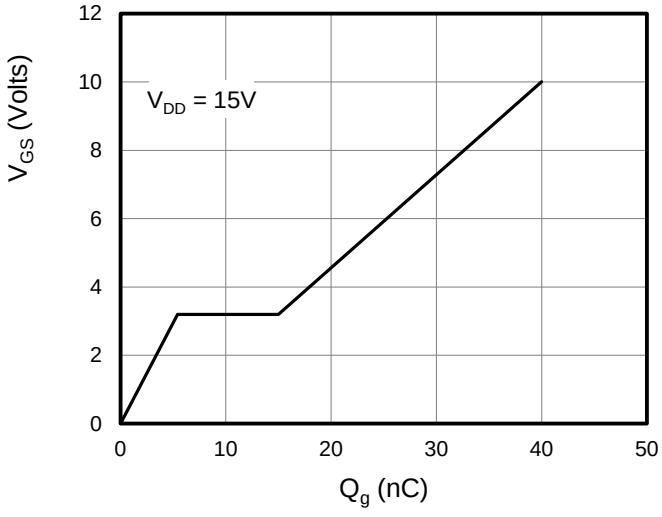


Figure 5: Gate Charge Characteristics

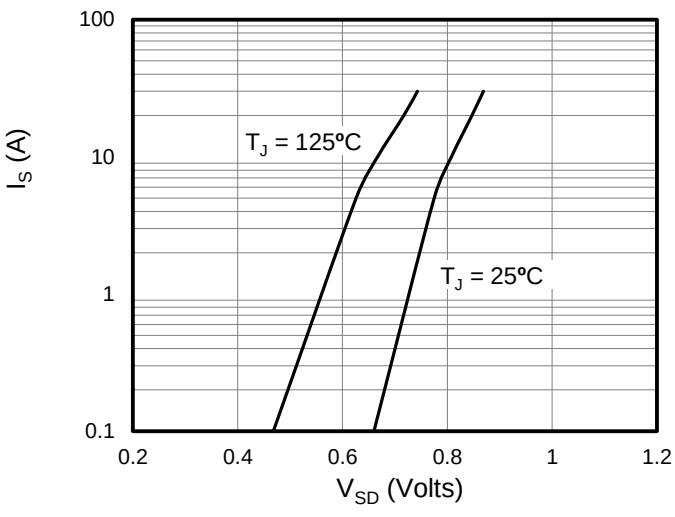


Figure 6: Body Diode Forward Voltage

Typical Characteristics T_J = 25ºC, unless otherwise noted

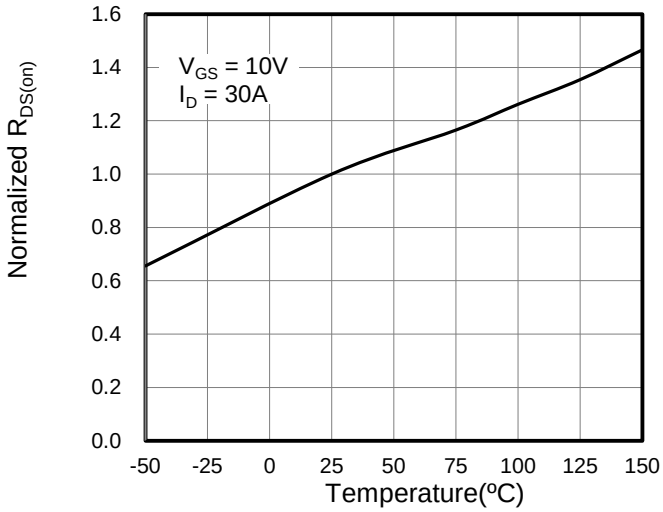


Figure 7: On-Resistance vs. Junction Temperature

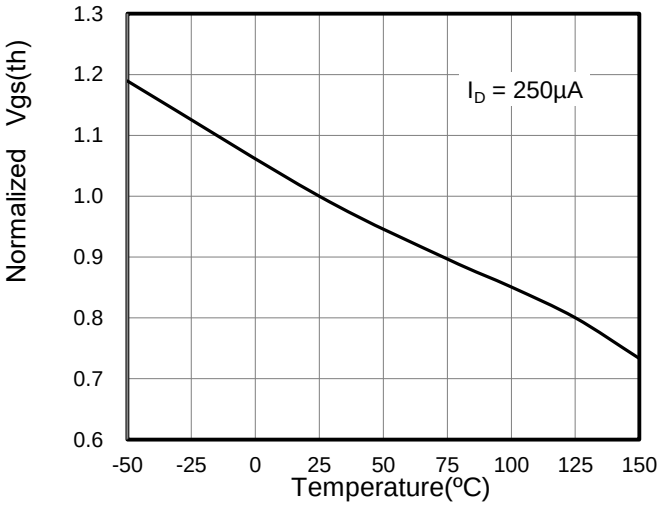


Figure 8: Vgs(th) vs. Junction Temperature

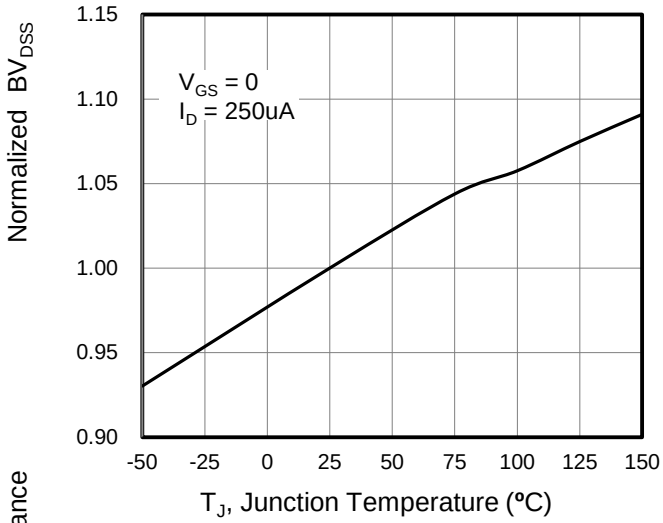


Figure 9: BV_{DSS} vs. Junction Temperature

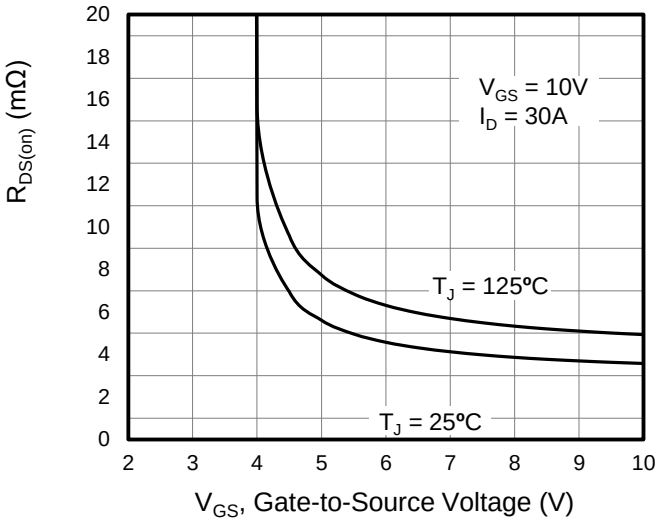


Figure 10: On-Resistance vs. Gate-Source Voltage

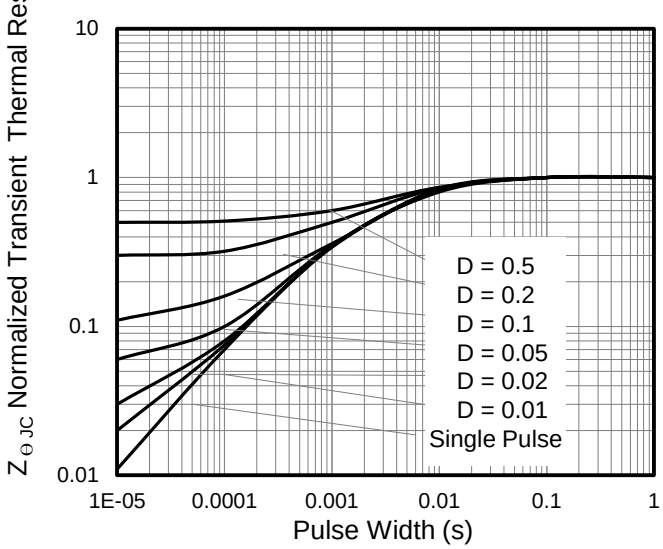


Figure 11: Normalized Transient Thermal Resistance

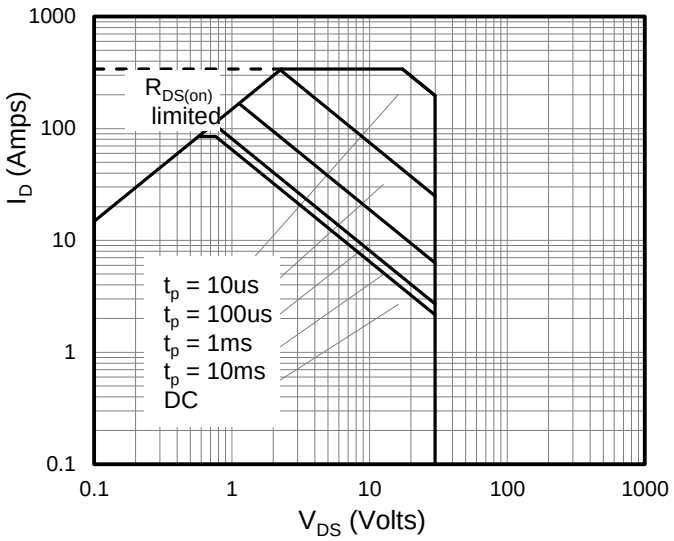


Figure 12: Safe Operating Area

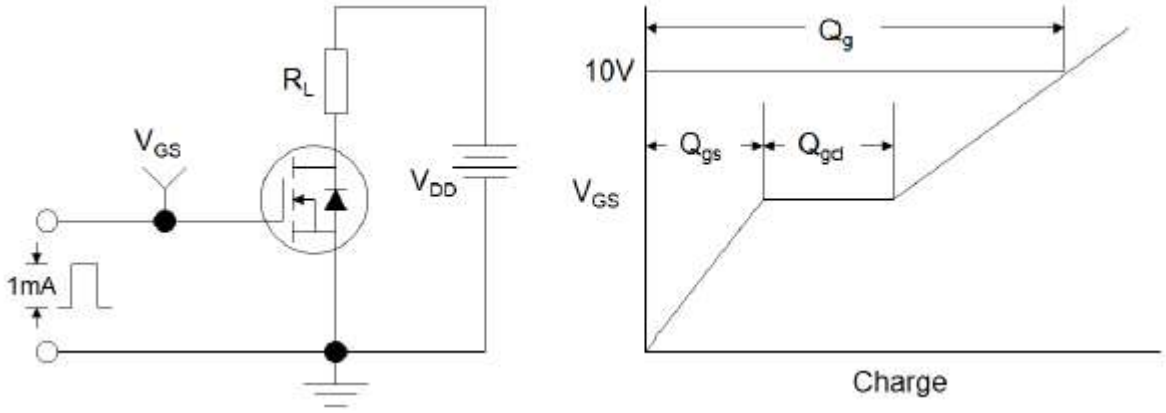


Figure1:Gate Charge Test Circuit & Waveform

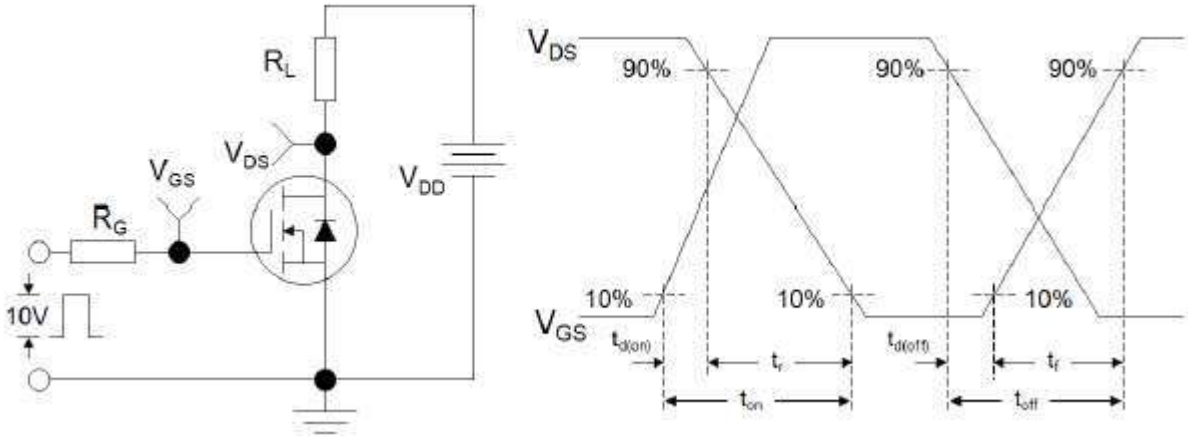


Figure 2: Resistive Switching Test Circuit & Waveforms

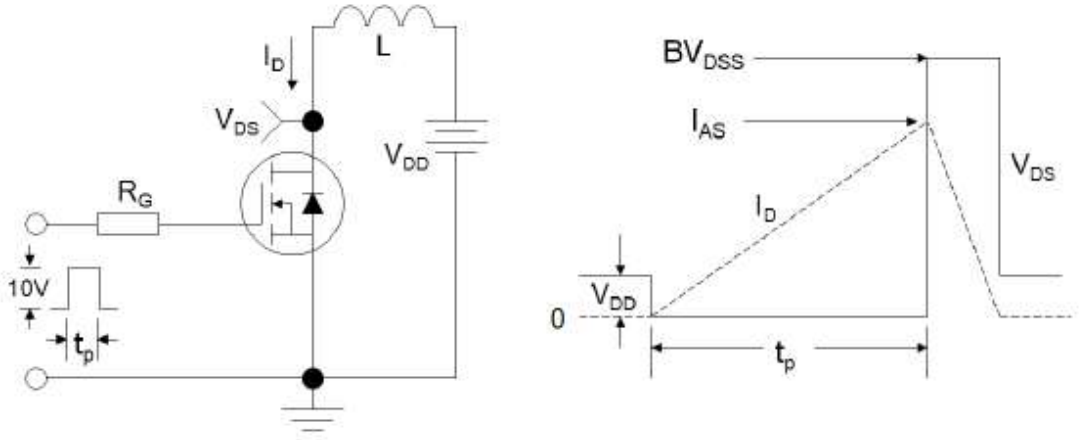


Figure 3:Unclamped Inductive Switching Test Circuit & Waveforms

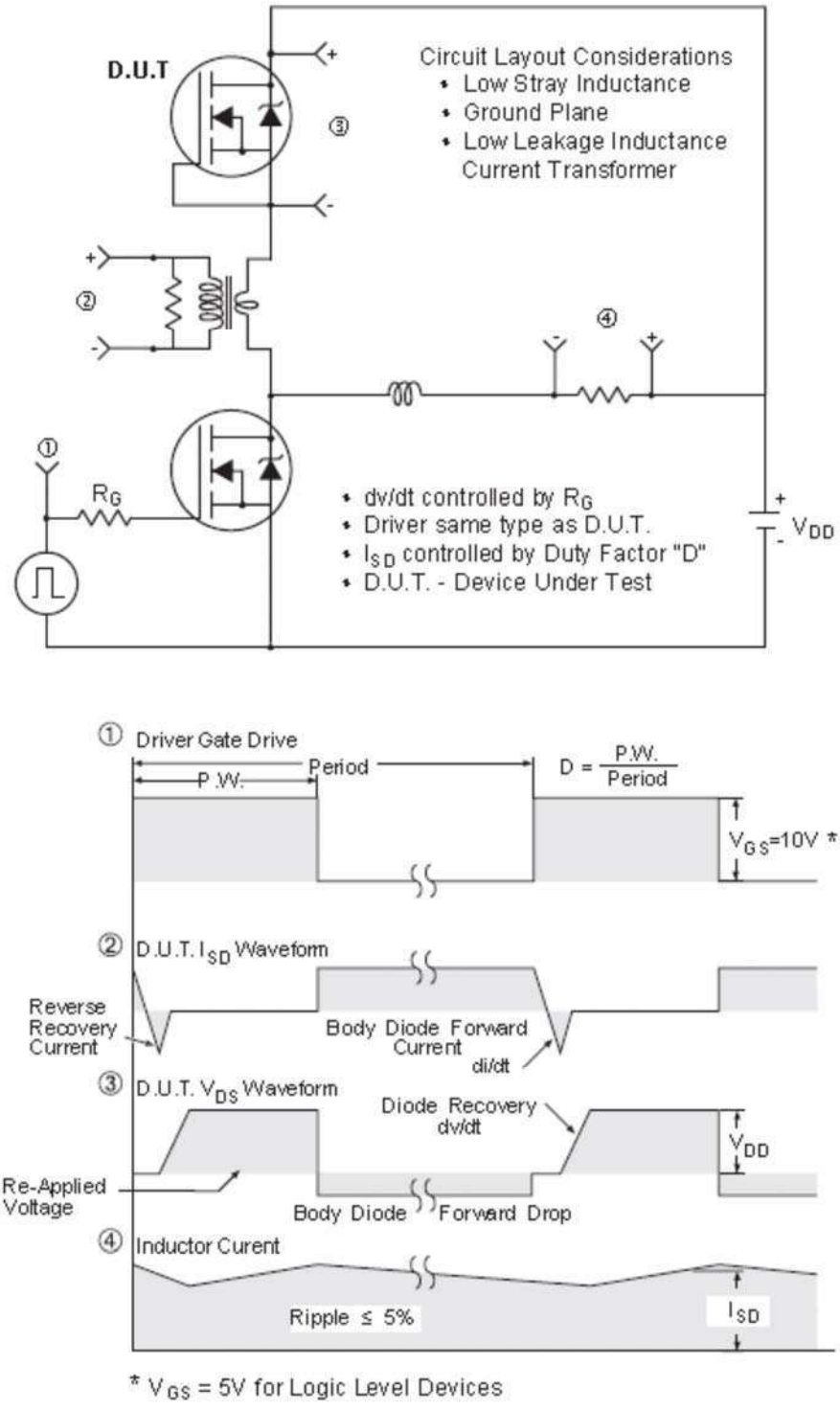
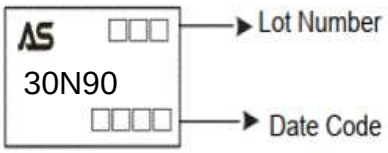


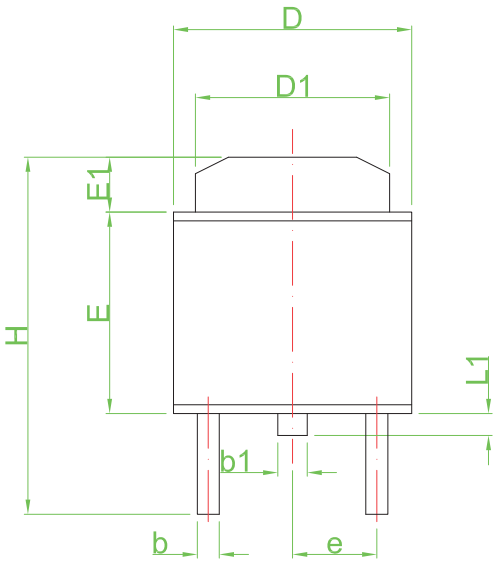
Figure 4:Peak Diode Recovery dv/dt Test Circuit & Waveforms (For N-channel)

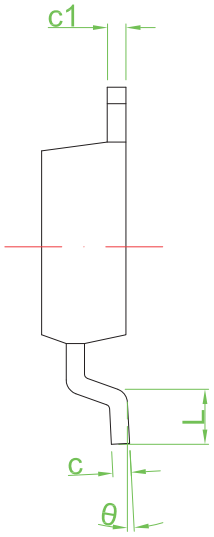
Ordering and Marking Information

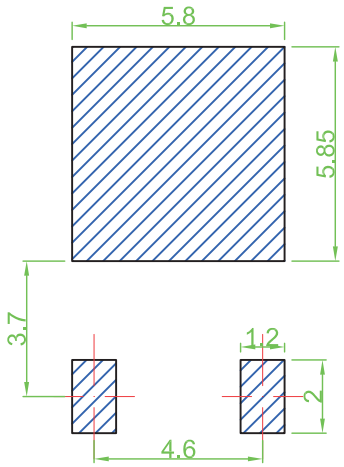
Ordering Device No.	Marking	Package	Packing	Quantity
ASDM30N90KQ-R	30N90	TO-252	Tape&Reel	2500/Reel

PACKAGE	MARKING
TO-252	

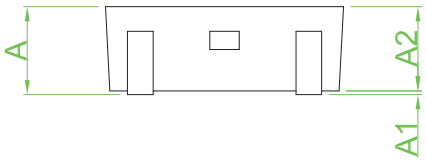
TO-252 PACKAGE IN FORMATION



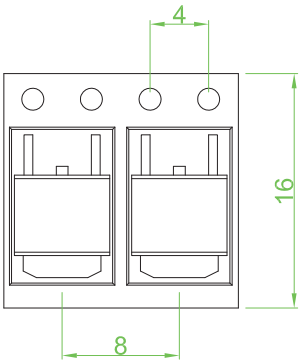




Recommended Land Pattern



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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