

30V/90 A N-Channel MOSFET

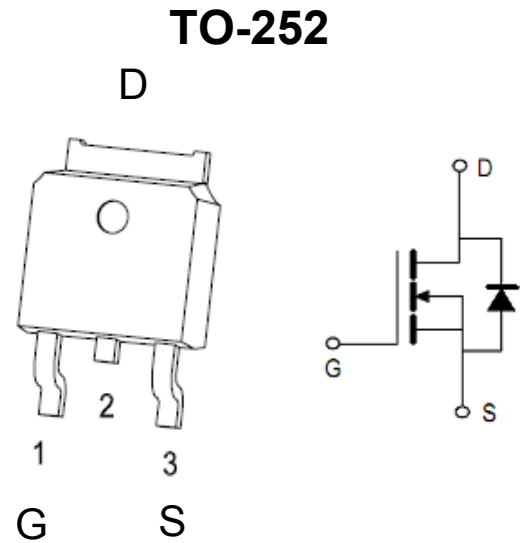
BVDSS	30	V
ID	90	A
RDSON@VGS=10V	3.1	mΩ
RDSON@VGS=4.5V	4.8	mΩ

Features

- Low On-Resistance.
- Fast Switching
- 100% Avalanche Tested
- Repetitive Avalanche Allowed up to Tjmax

Applications

- Load Switch
- PWM Application
- Power management



Order Information

Product	Package	Marking	Reel
M03N90L	TO-252	PTD3090	2500PCS

Absolute Maximum Ratings

Symbol	Parameter		Rating	Unit
Common Ratings (TC=25°C Unless Otherwise Noted)				
V _{(BR)DSS}	Drain-Source Breakdown Voltage		30	V
V _{GS}	Gate-Source Voltage		±20	V
T _J	Maximum Junction Temperature		150	°C
T _{STG}	Storage Temperature Range		-55 to 150	°C
I _S	Diode Continuous Forward Current	TC =25°C	90	A
Mounted on Large Heat Sink				
E _{AS}	Single Pulse Avalanche Energy (Note1)		225	mJ
I _{DM}	Pulse Drain Current Tested (Sillicon Limit) (Note2)	TC =25°C	360	A
I _D	Continuous Drain current	TC =25°C	90	A
P _D	Maximum Power Dissipation	TC =25°C	85	W
R _{θJc}	Thermal Resistance Junction-to-Case (Note3)		1.83	°C/W

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Electrical Characteristics (TA=25°C unless otherwise noted)

Symbol	Parameter	Condition	Min.	Typ.	Max.	Unit
Static Electrical Characteristics @ TJ = 25°C (unless otherwise stated)						
V _{(BR)DSS}	Drain- Source Breakdown Voltage	VGS=0V ID=250μA	30	--	--	V
I _{DSS}	Zero Gate Voltage Drain current	VDS=30V,VGS=0V	--	--	1	μA
I _{GSS}	Gate-Body Leakage Current	VGS=±20V,VDS=0V	--	--	±100	nA
V _{GS(TH)}	Gate Threshold Voltage	VDS=VGS,ID=250μA	1.2	1.75	2.5	V
R _{DS(ON)}	Drain-Source On-State Resistance (Note4)	VGS=10V, ID=40A	--	3.1	3.6	mΩ
		VGS=4.5V, ID=20A	--	4.8	7	mΩ
Dynamic Electrical Characteristics @ Tj = 25°C (unless otherwise stated) (Note5)						
C _{iss}	Input Capacitance	VDS=15V, VGS=0V, F=1MHz	--	2100	--	pF
C _{oss}	Output Capacitance		--	326	--	pF
C _{rss}	Reverse Transfer Capacitance		--	282	--	pF
Q _g	Total Gate Charge	VDS=15V, ID=30A, VGS=10V	--	45	--	nC
Q _{gs}	Gate-Source Charge		--	3	--	nC
Q _{gd}	Gate-Drain Charge		--	15	--	nC
Switching Characteristics (Note5)						
t _{d(on)}	Turn-on Delay Time	VDS=15V, ID=30A, RG=3Ω, VGS=10V	--	21	--	nS
t _r	Turn-on Rise Time		--	32	--	nS
t _{d(off)}	Turn-off Delay Time		--	59	--	nS
t _f	Turn-off Fall Time		--	34	--	nS
Source- Drain Diode Characteristics@ TJ = 25°C (unless otherwise stated)						
V _{SD}	Forward on voltage	IS=40A,VGS=0V	--	--	1.2	V

Note:

- Limited by TJmax, starting TJ = 25° C, RG = 25Ω, VD =15V, VGS =10V. Part not recommended for use above this value.
- Repetitive Rating: Pulse width limited by maximum junction temperature.
- Surface Mounted on FR4 Board, t ≤ 10 sec.
- Pulse Test: pulse width ≤ 300 us, duty cycle ≤ 2%.
- Guranteed by design, not subject to production testing.

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Typical Characteristics

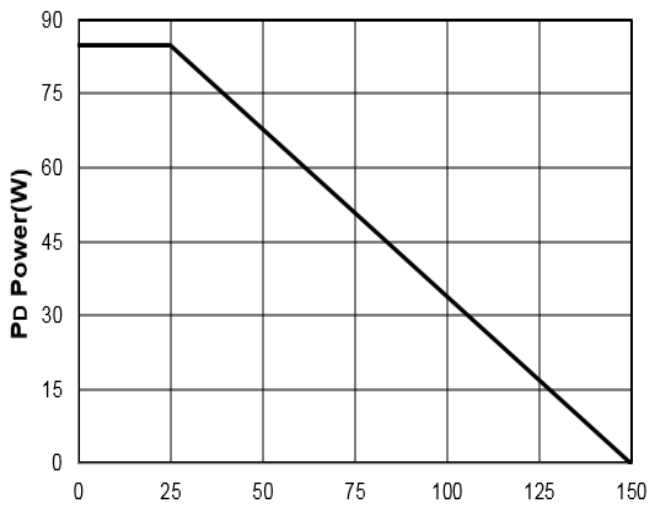


Figure1: T_j Junction Temperature (°C)

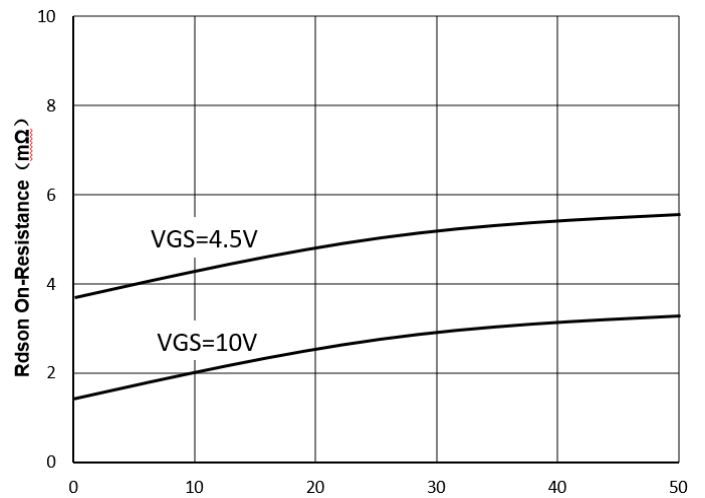


Figure2: I_D Drain Current (A)

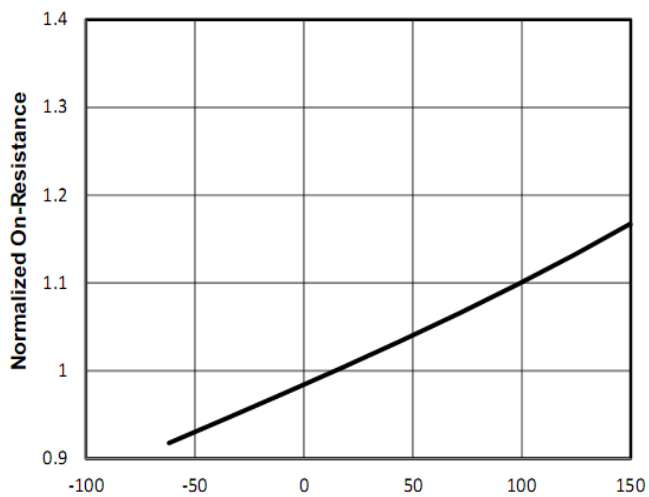


Figure3: T_j Junction Temperature (°C)

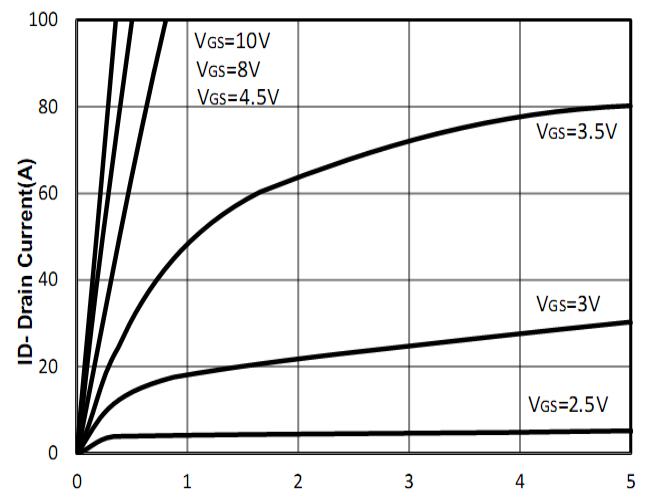


Figure4: V_{DS} Drain-Source Voltage (V)

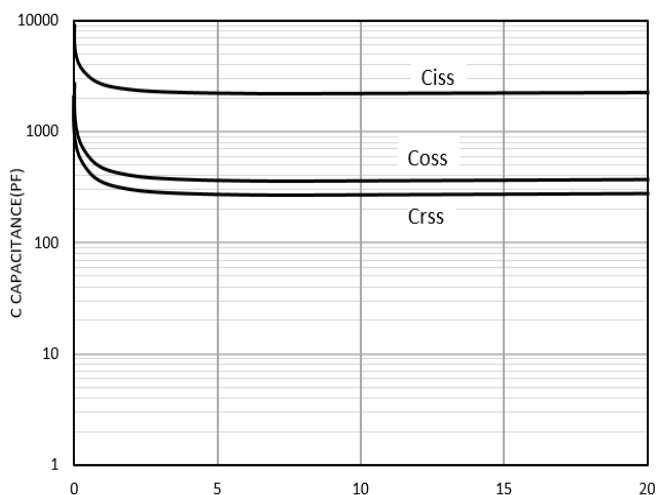


Figure5: V_{DS} Drain-Source Voltage (V)

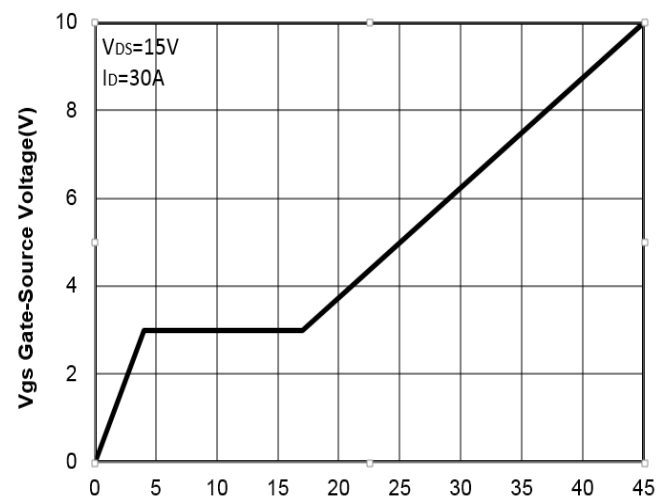


Figure6: Q_g Gate Charge (nC)

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Typical Characteristics

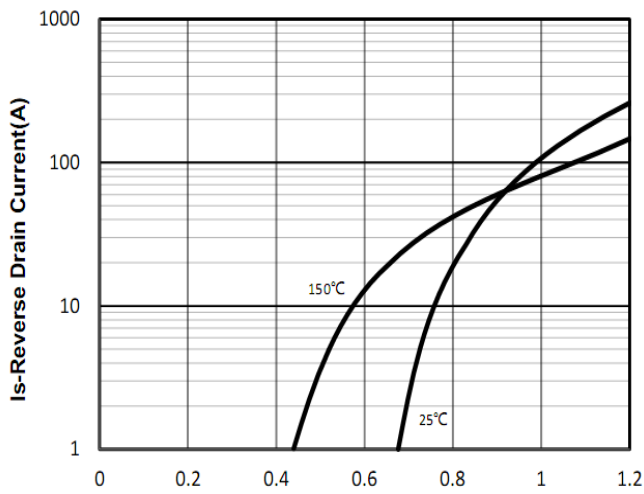


Figure7: Vsd Source-Drain Voltage (V)

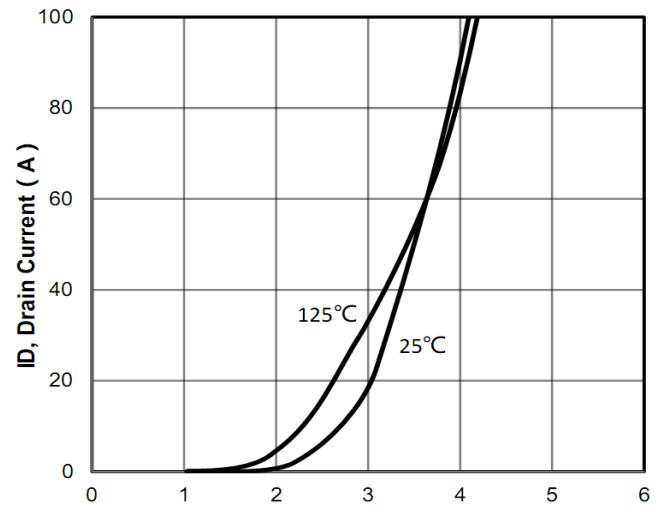


Figure8: Vgs Gate-Source Voltage (V)

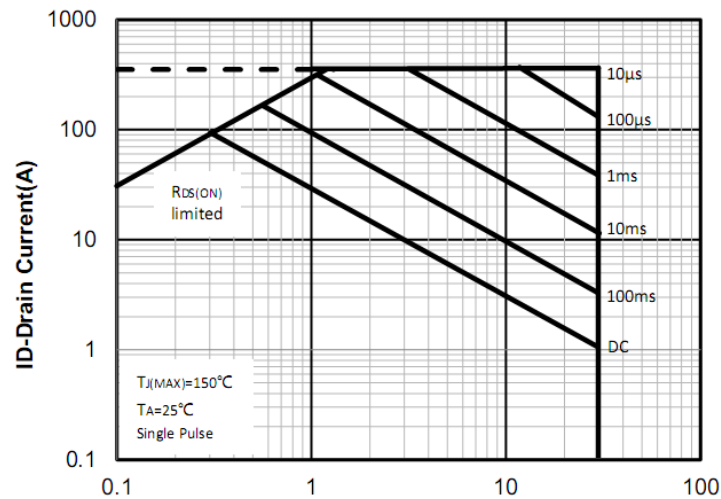


Figure9: Vds Drain -Source Voltage (V)

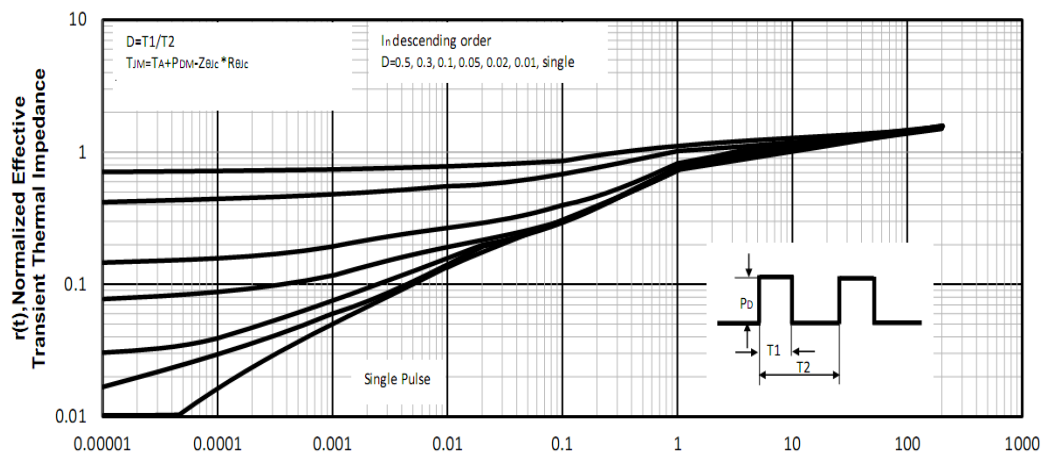


Figure10: Square Wave Pulse Duration (sec)

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Test Circuit and Waveform:

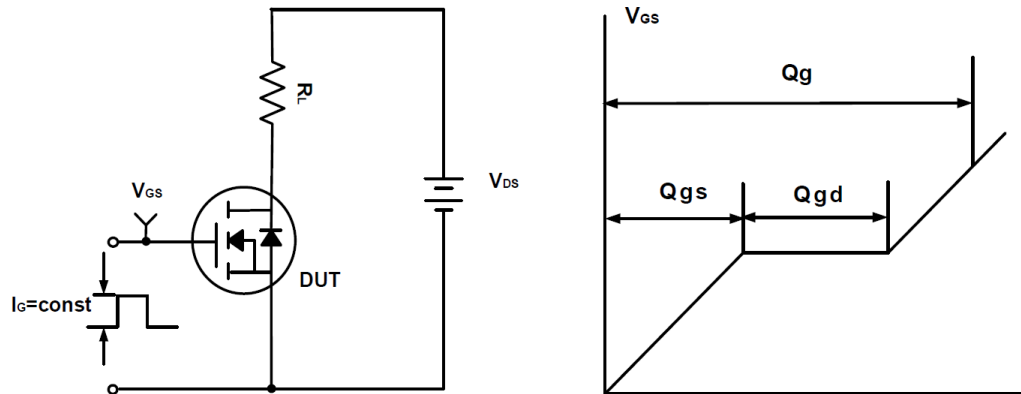


Figure A Gate Charge Test Circuit & Waveforms

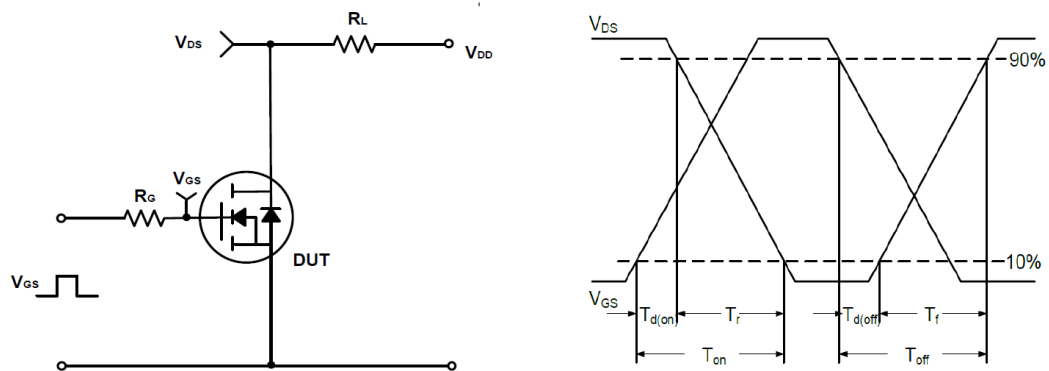


Figure B Switching Test Circuit & Waveforms

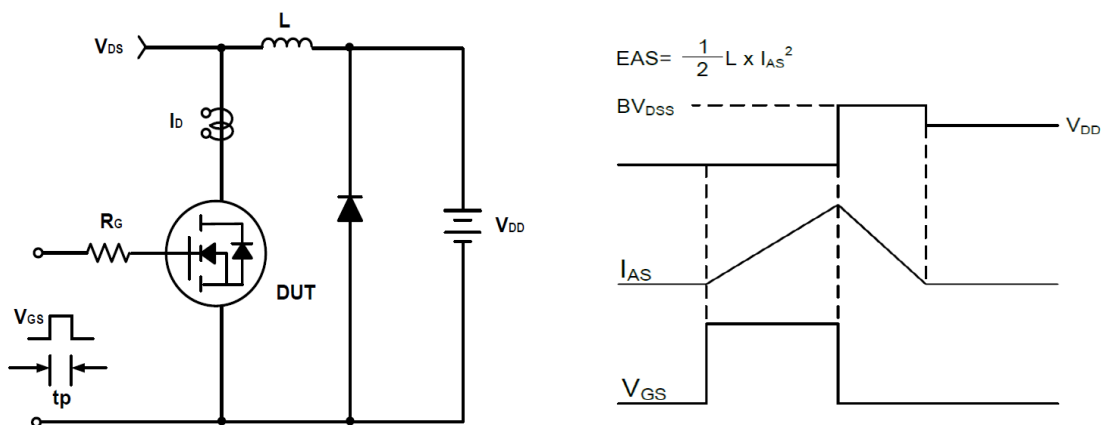
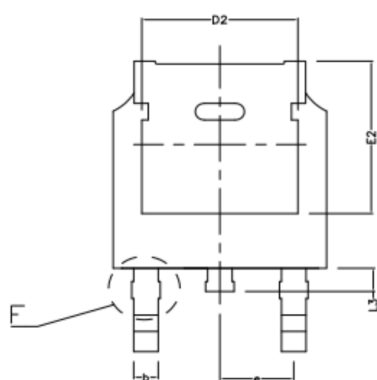
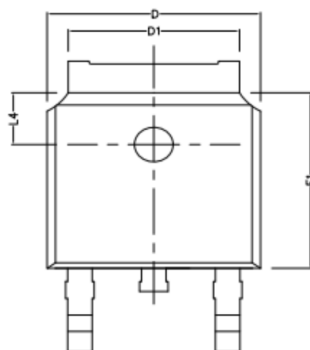


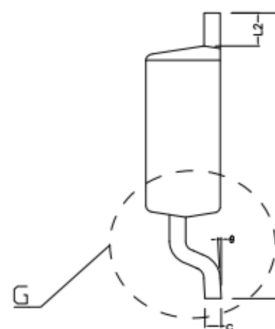
Figure C Unclamped Inductive Switching Circuit & Waveforms

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TO-252 Package Outline Dimensions (Units: mm)


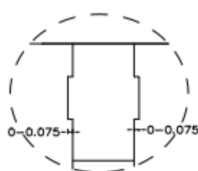
BOTTOM VIEW



TOP VIEW



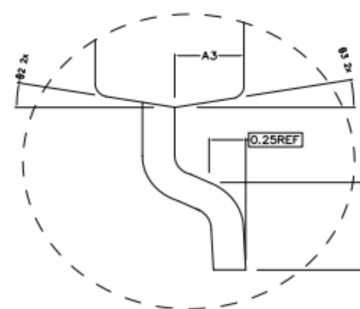
SIDE VIEW



DETAIL F



SIDE VIEW



DETAIL G

COMMON DIMENSIONS (UNITS OF MEASURE IS mm)			
	MIN	NORMAL	MAX
A1	0.000	0.100	0.150
A2	2.200	2.300	2.400
A3	1.020	1.070	1.120
b	0.710	0.760	0.810
c	0.460	0.508	0.550
D	6.500	6.600	6.700
D1	5.330REF		
D2	4.830REF		
E	9.900	10.100	10.300
E1	6.000	6.100	6.200
E2	5.600REF		
e	2.286TYPE		
L	1.400	1.550	1.700
L2	1.10REF		
L3	0.80REF		
L4	1.80REF		
θ	0~8°		
θ1	7° TYPE		
θ2	10° TYPE		
θ3	10° TYPE		