



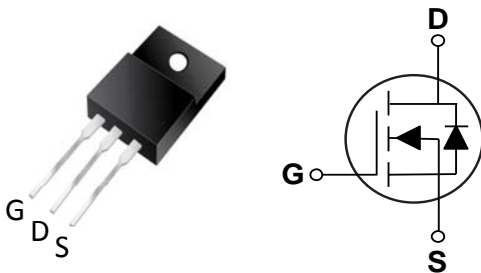
General Description

The I2MNAB900 is a high voltage power MOSFET designed to have better characteristics, such as fast switching time, low gate charge, low on-state resistance and have a high rugged avalanche characteristic.

This power MOSFET is usually used in high speed switching applications including power supplies, PWM motor controls, high efficient AC to DC converters and bridge circuits.

BV _{DSS}	R _{DS(ON)}	I _D
650 V	0.9 Ω	10 A

TO-220F Pin Configuration



Features

- $R_{DS(ON)} \leq 0.9 \Omega @ V_{GS}=10V$
- Fast Switching Capability
- Improved dv/dt Capability

Absolute Maximum Ratings $T_c=25^\circ C$ unless otherwise noted

Symbol	Parameter	Rating	Units
V _{DS}	Drain-Source Voltage	650	V
V _{GS}	Gate-Source Voltage	±30	V
I _D	Drain Current - Continuous	10	A
I _{DM}	Drain Current - Pulsed (NOTE 2)	20	A
EAS	Single Pulse Avalanche Energy (NOTE 3)	840	mJ
P _D	Power Dissipation	38	W
T _J	Operating Junction Temperature Range	-50 to 150	°C
T _{STG}	Storage Temperature Range	-50 to 150	°C
Marking Code		NAB900	

NOTES :

1. Absolute maximum ratings are those values beyond which the device could be permanently damaged.
Absolute maximum ratings are stress ratings only and functional device operation is not implied.
2. Repetitive Rating: Pulse width limited by maximum junction temperature.
3. L=100mH, V_{DD}=50V, R_G=25Ω, Starting T_J= 25°C

Thermal Characteristics

Symbol	Parameter	Typ.	Max.	Unit
R _{θJA}	Thermal Resistance Junction to Ambient	---	62.5	°C/W
R _{θJC}	Thermal Resistance Junction to Case	---	3.28	°C/W

**Electrical Characteristics (T_J=25°C, unless otherwise noted)****Off Characteristics**

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
BV _{DSS}	Drain-Source Breakdown Voltage	V _{GS} =0V, I _D =250uA	650	---	---	V
I _{DSS}	Drain-Source Leakage Current	V _{DS} =650V, V _{GS} =0V	---	---	10	uA
I _{GSS}	Gate-Source Leakage Current	V _{GS} =±30V, V _{DS} =0V	---	---	±100	nA

On Characteristics

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
R _{DS(ON)}	Static Drain-Source On-Resistance	V _{GS} =10V, I _D =5A	---	0.75	0.9	Ω
V _{GS(th)}	Gate Threshold Voltage	V _{GS} =V _{DS} , I _D =250uA	2.0	---	4.0	V

Dynamic and switching Characteristics

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
Q _g	Total Gate Charge	V _{DS} =520V, V _{GS} =10V, I _D =10A, I _G =1mA (NOTE 4、5)	---	34	---	nC
Q _{gs}	Gate-Source Charge		---	12	---	
Q _{gd}	Gate-Drain Charge		---	7.4	---	
T _{d(on)}	Turn-On Delay Time	V _{DS} =325V, V _{GS} =10V, R _G =25Ω, I _D =10A (NOTE 4、5)	---	26	---	ns
T _r	Rise Time		---	21	---	
T _{d(off)}	Turn-Off Delay Time		---	80	---	
T _f	Fall Time		---	23	---	
C _{iss}	Input Capacitance	V _{DS} =25V, V _{GS} =0V, F=1MHz	---	1554	---	pF
C _{oss}	Output Capacitance		---	158	---	
C _{rss}	Reverse Transfer Capacitance		---	4.4	---	

Drain-Source Diode Characteristics and Ratings

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
I _S	Continuous Source Current		---	---	10	A
I _{SM}	Pulsed Source Current		---	---	40	A
V _{SD}	Diode Forward Voltage	V _{GS} =0V, I _S =10A	---	---	1.4	V
t _{rr}	Reverse Recovery Time	I _S =10A, V _{GS} =0V,	---	375	---	nS
Q _{rr}	Reverse Recovery Charge	di _F /dt=100A/μs (NOTE 4)	---	5.2	---	uC

NOTES :

4. Pulse test : pulse width ≤ 300us, duty cycle ≤ 2%.
5. Essentially independent of operating temperature.



Test Circuits And Waveforms

FIG. 1-Peak Diode Recovery dv/dt Test Circuit

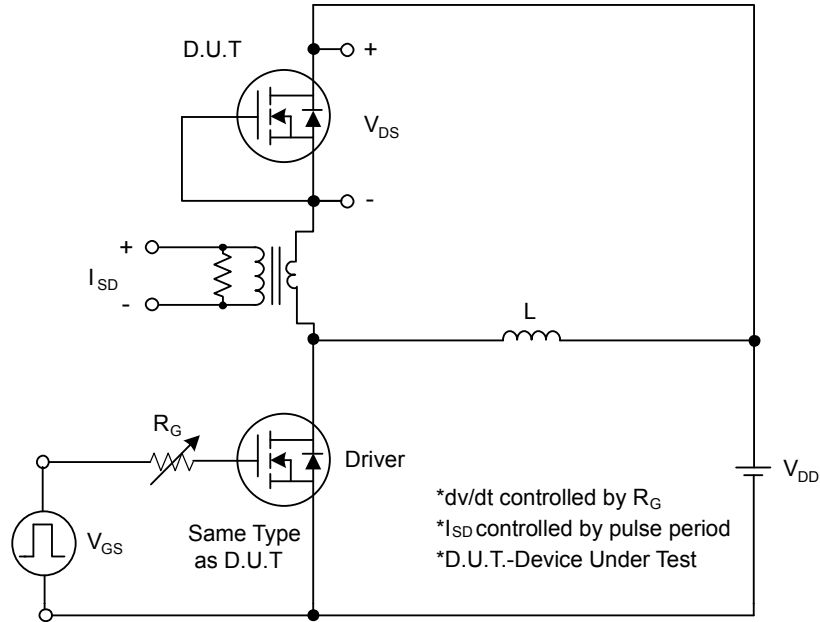
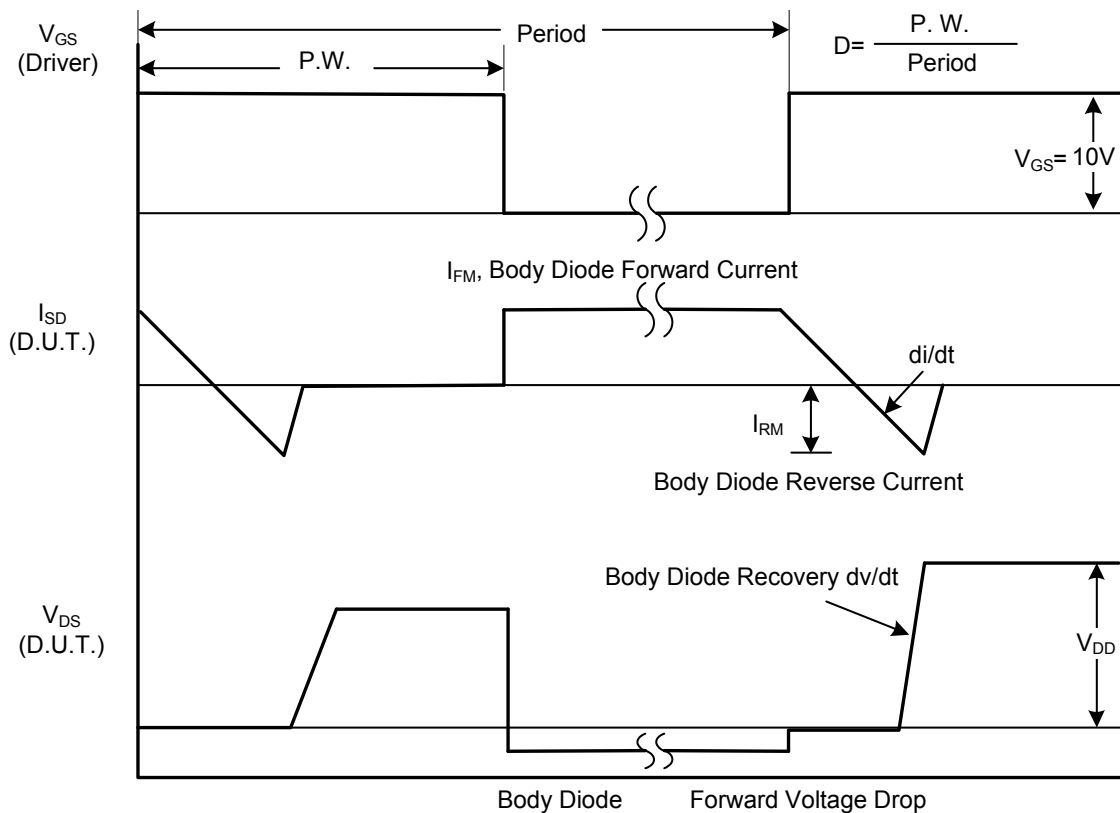


FIG. 2-Peak Diode Recovery dv/dt Waveforms





Test Circuits And Waveforms

FIG. 3-Switching Test Circuit

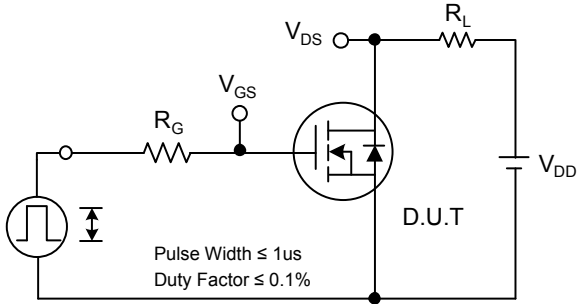


FIG. 4-Switching Waveforms

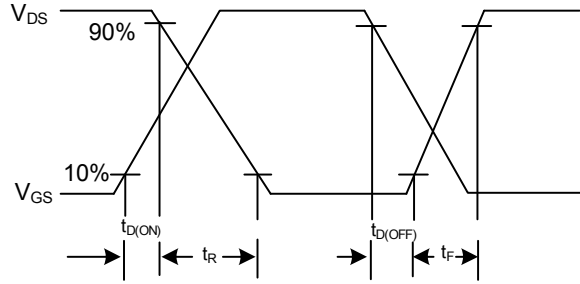


FIG. 5-Gate Charge Test Circuit

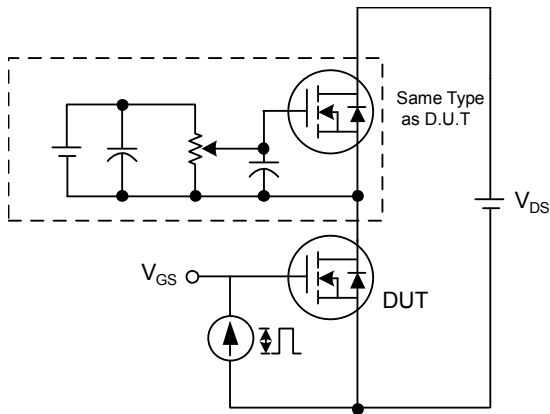


FIG. 6-Gate Charge Waveform

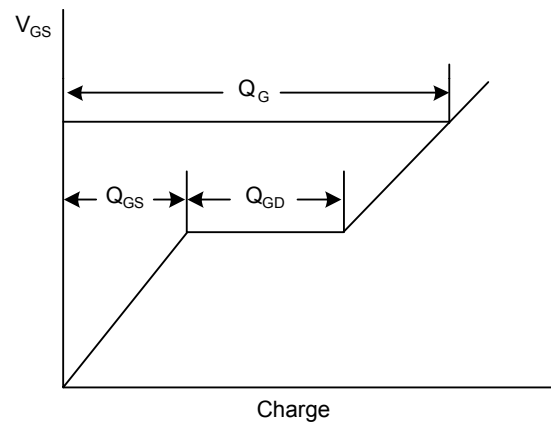


FIG. 7-Unclamped Inductive Switching Test Circuit

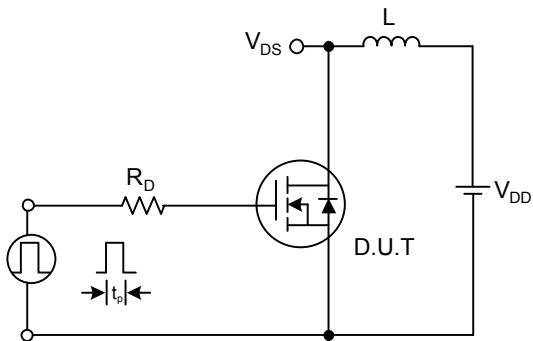
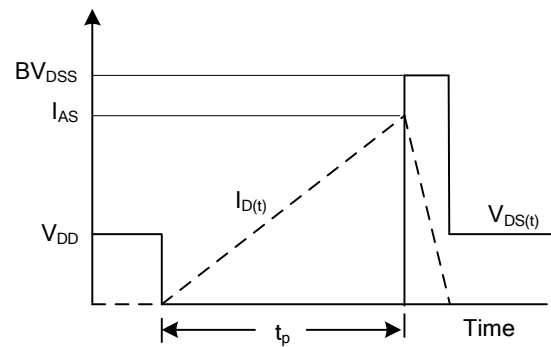


FIG. 8-Unclamped Inductive Switching Waveforms





Characteristics Curves

FIG. 1-Drain Current vs. Drain-Source Voltage

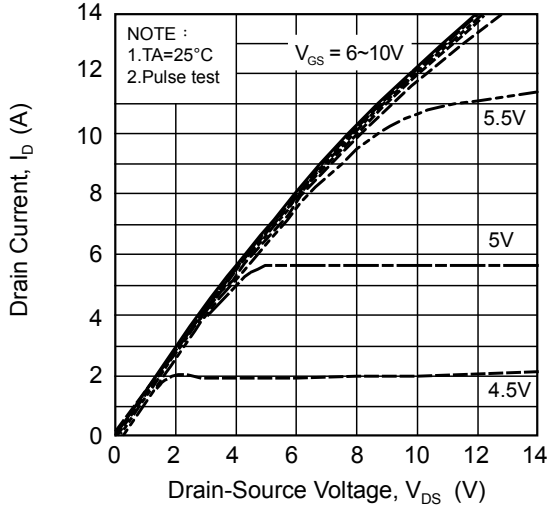


FIG. 2-Drain-Source On Resistance vs. Gate-Source Voltage

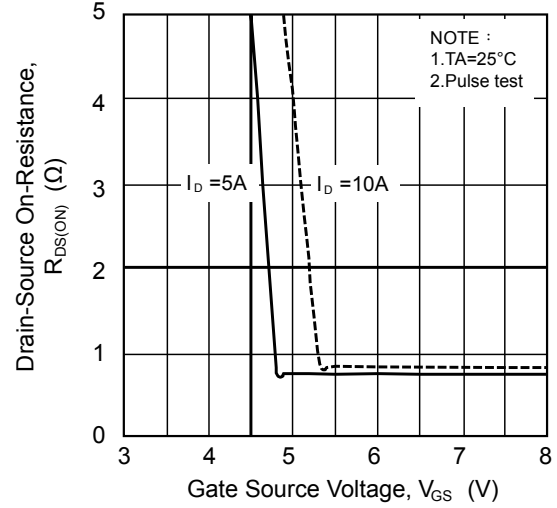


FIG. 3-Gate Charge Characteristics

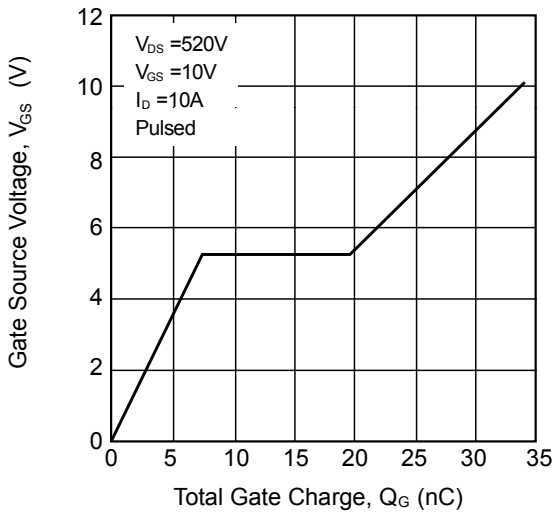


FIG. 4-Capacitance Characteristics

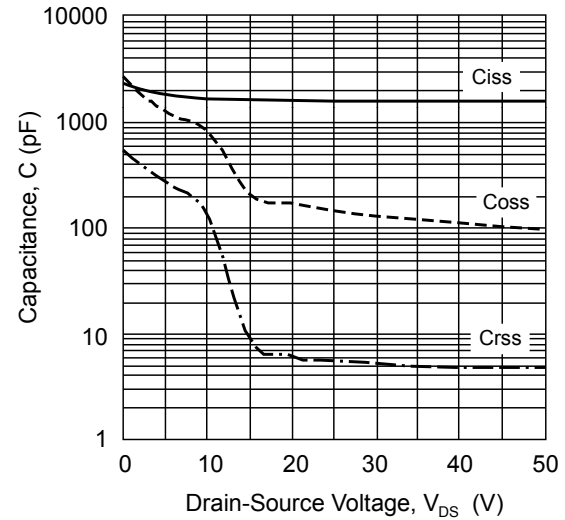


FIG. 5-Drain-Source On Resistance vs. Junction Temperature

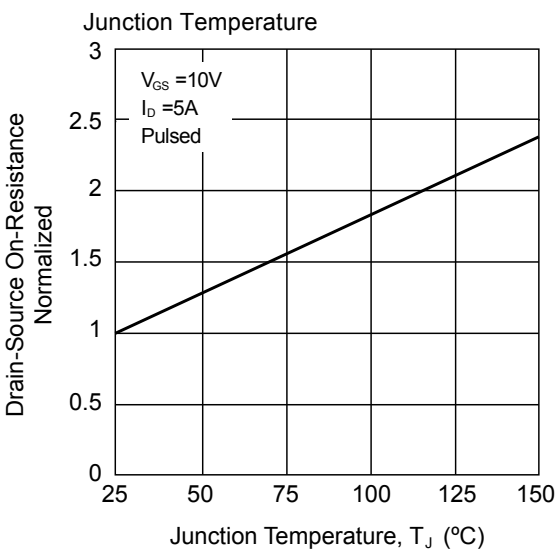
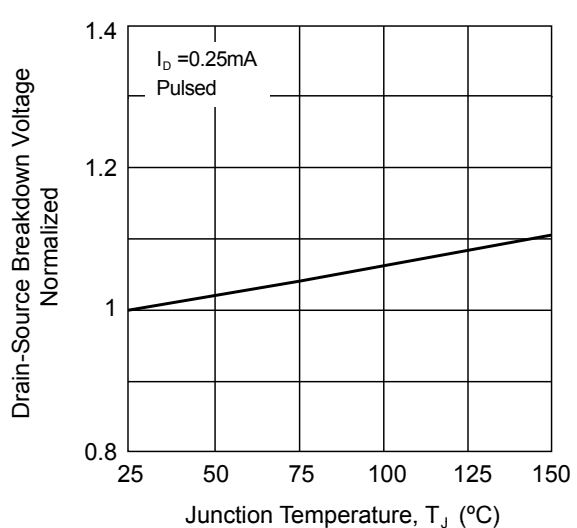


FIG. 6-Breakdown Voltage vs. Junction Temperature





Characteristics Curves

FIG. 7-Gate Threshold Voltage vs. Junction Temperature

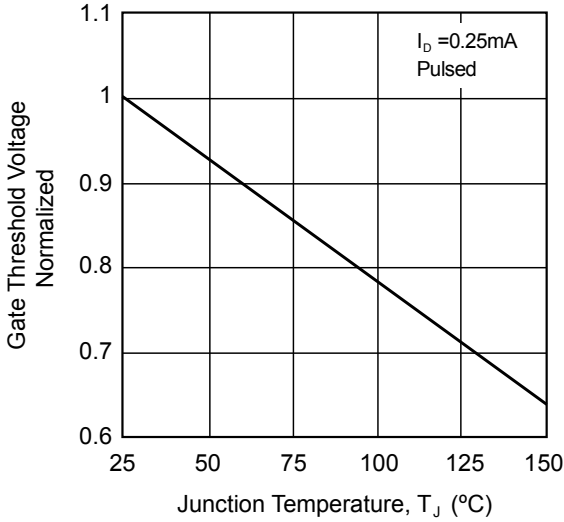


FIG. 8-Source Current vs. Source-Drain Voltage

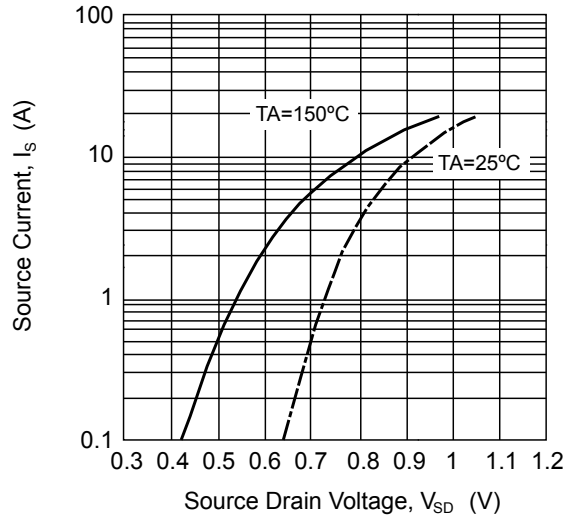


FIG. 9-Drain Current vs. Gate-Source Voltage

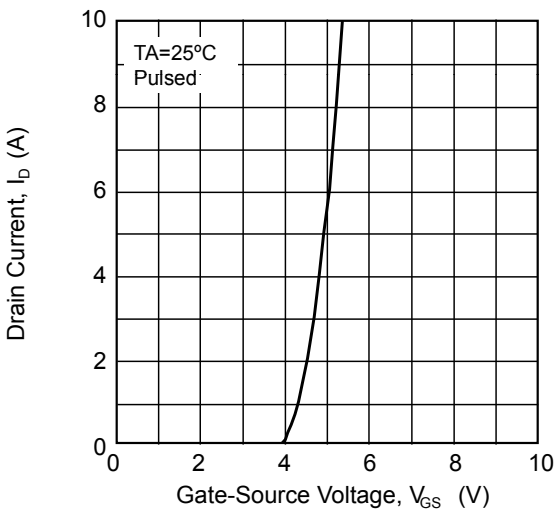


FIG. 10-Drain-Source On Resistance vs. Drain Current

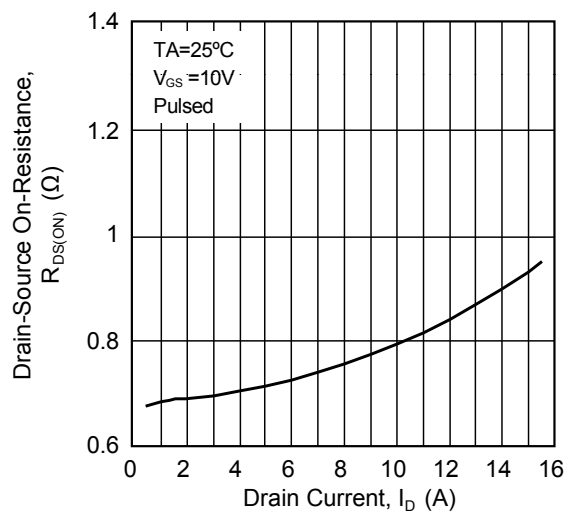
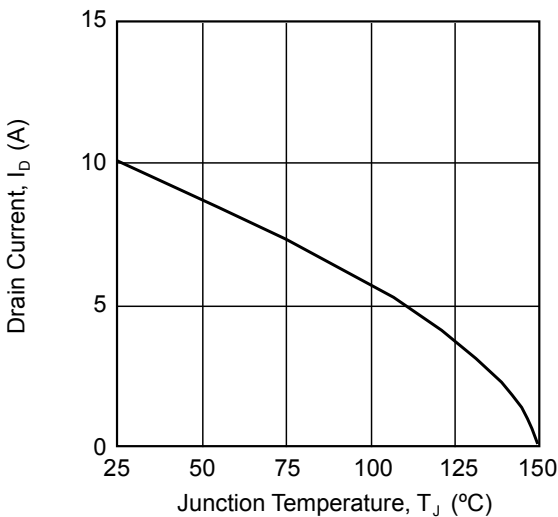
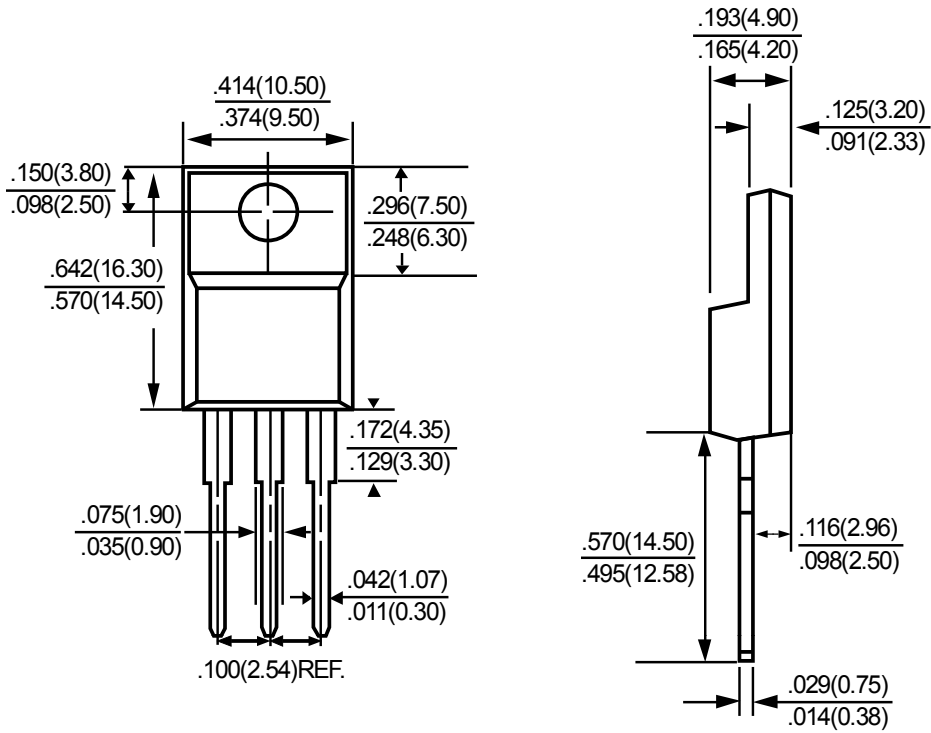


FIG. 11-Drain Current vs. Junction Temperature





Package Outline Dimensions



TO-220F

Dimensions in inches and (millimeters)



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