



2A, 600V N-CHANNEL POWER MOSFET

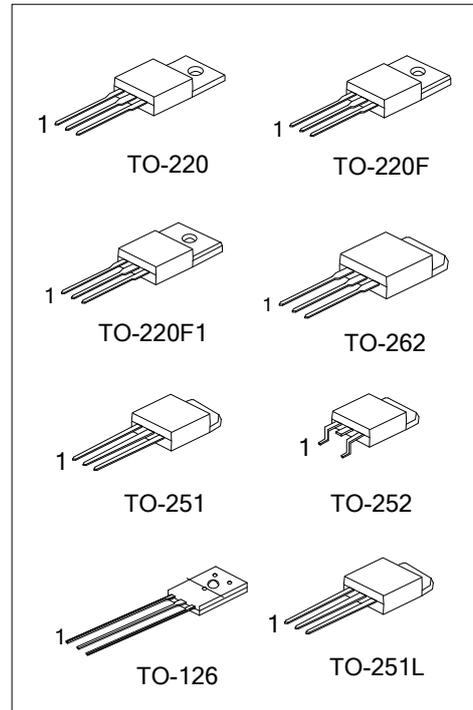
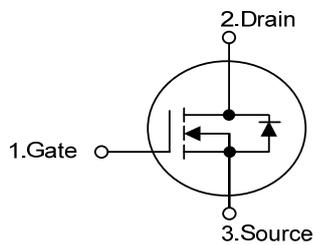
■ DESCRIPTION

The AMS **2N60** is a high voltage power MOSFET and is designed to have better characteristics, such as fast switching time, low gate charge, low on-state resistance and have a high rugged avalanche characteristics. This power MOSFET is usually used at high speed switching applications in power supplies, PWM motor controls, high efficient DC to DC converters and bridge circuits.

■ FEATURES

- * $R_{DS(ON)} = 5\Omega @ V_{GS} = 10V$
- * Ultra Low gate charge (typical 9.0nC)
- * Low reverse transfer capacitance ($C_{RSS} =$ typical 5.0 pF)
- * Fast switching capability
- * Avalanche energy specified
- * Improved dv/dt capability, high ruggedness

■ SYMBOL





■ ABSOLUTE MAXIMUM RATINGS (T_C = 25°C, unless otherwise specified)

PARAMETER	SYMBOL	RATINGS	UNIT
Drain-Source Voltage	V _{DSS}	600	V
Gate-Source Voltage	V _{GSS}	±30	V
Avalanche Current (Note 2)	I _{AR}	2.0	A
Drain Current	Continuous	I _D	2.0
	Pulsed (Note 2)	I _{DM}	8.0
Avalanche Energy	Single Pulsed (Note 3)	E _{AS}	140
	Repetitive (Note 2)	E _{AR}	4.5
Peak Diode Recovery dv/dt (Note 4)	dv/dt	4.5	V/ns
Power Dissipation	TO-220/ TO-262	P _D (T _C = 25°C)	54
	TO-220F/TO-220F1		23
	TO-251/TO-251L/TO-252		44
	TO-126		40
Junction Temperature	T _J	+150	°C
Operating Temperature	T _{OPR}	-55 ~ +150	°C
Storage Temperature	T _{STG}	-55 ~ +150	°C

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 T_J

3. L=64mH, I_{AS}=2.0A, V_{DD}=50V, R_G=25 Ω, Starting T_J = 25°C

4. I_{SD}≤2.4A, di/dt≤200A/μs, V_{DD} ≤ BV_{DSS}, Starting T_J = 25°C

■ THERMAL DATA

PARAMETER	PACKAGE	SYMBOL	RATINGS	UNIT
Junction to Ambient	TO-220/ TO-262	θ _{JA}	62.5	°C/W
	TO-220F/TO-220F1		62.5	°C/W
	TO-251/TO-251L/TO-252		100	°C/W
	TO-126		89	°C/W
Junction to Case	TO-220/ TO-262	θ _{Jc}	2.32	°C/W
	TO-220F/TO-220F1		5.5	°C/W
	TO-251/TO-251L/TO-252		2.87	°C/W
	TO-126		3.12	°C/W



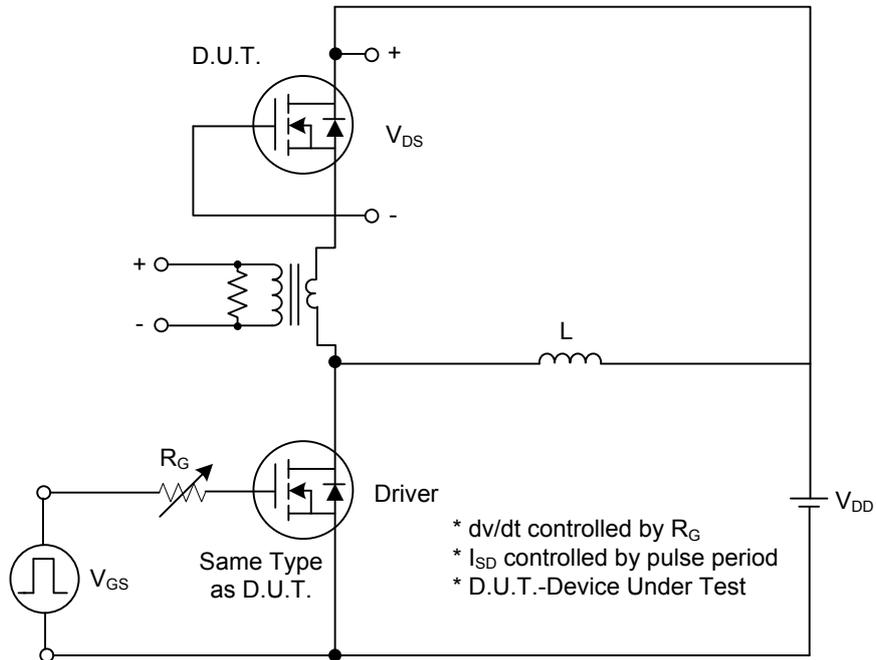
■ ELECTRICAL CHARACTERISTICS (T_J=25°C, unless otherwise specified)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
OFF CHARACTERISTICS						
Drain-Source Breakdown Voltage	BV _{DSS}	V _{GS} = 0V, I _D = 250μA	600			V
Drain-Source Leakage Current	I _{DSS}	V _{DS} = 600V, V _{GS} = 0V			10	μA
Gate-Source Leakage Current	Forward	I _{GSS}			100	nA
	Reverse				-100	nA
Breakdown Voltage Temperature Coefficient	ΔBV _{DSS} /ΔT _J	I _D =250μA, Referenced to 25°C		0.4		V/°C
ON CHARACTERISTICS						
Gate Threshold Voltage	V _{GS(TH)}	V _{DS} = V _{GS} , I _D = 250μA	2.0		4.0	V
Static Drain-Source On-State Resistance	R _{DS(ON)}	V _{GS} = 10V, I _D = 1A		3.6	5	Ω
DYNAMIC CHARACTERISTICS						
Input Capacitance	C _{ISS}	V _{DS} = 25V, V _{GS} = 0V, f = 1MHz		270	350	pF
Output Capacitance	C _{OSS}			40	50	pF
Reverse Transfer Capacitance	C _{RSS}			5	7	pF
SWITCHING CHARACTERISTICS						
Turn-On Delay Time	t _{D(ON)}	V _{DD} = 300V, I _D = 2.4A, R _G = 25Ω (Note 1, 2)		10	30	ns
Turn-On Rise Time	t _R			25	60	ns
Turn-Off Delay Time	t _{D(OFF)}			20	50	ns
Turn-Off Fall Time	t _F			25	60	ns
Total Gate Charge	Q _G	V _{DS} = 480V, V _{GS} = 10V, I _D = 2.4A (Note 1, 2)		9.0	11	nC
Gate-Source Charge	Q _{GS}			1.6		nC
Gate-Drain Charge	Q _{GD}			4.3		nC
DRAIN-SOURCE DIODE CHARACTERISTICS						
Drain-Source Diode Forward Voltage	V _{SD}	V _{GS} = 0V, I _{SD} = 2.0A			1.4	V
Continuous Drain-Source Current	I _{SD}				2.0	A
Pulsed Drain-Source Current	I _{SM}				8.0	A
Reverse Recovery Time	t _{TR}	V _{GS} = 0V, I _{SD} = 2.4A,		180		ns
Reverse Recovery Charge	Q _{RR}	di/dt = 100 A/μs (Note 1)		0.72		μC

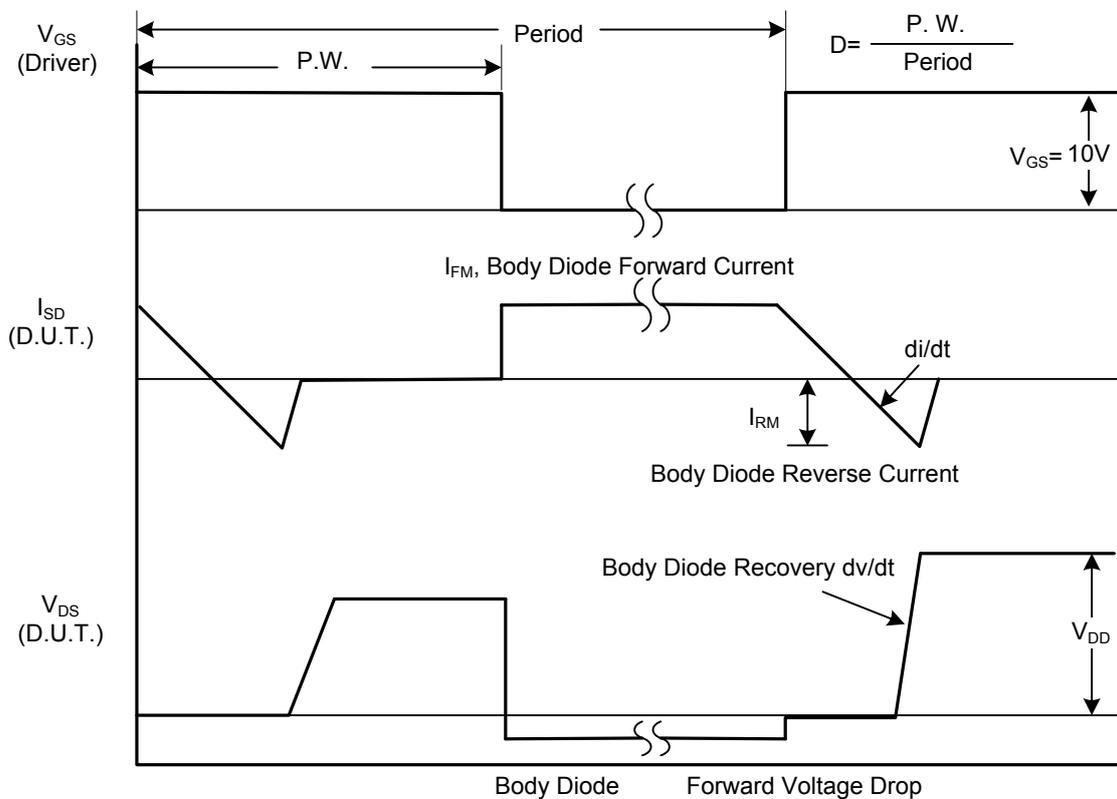
- Notes: 1. Pulse Test: Pulse width ≤ 300μs, Duty cycle ≤ 2%
 2. Essentially independent of operating temperature



■ TEST CIRCUITS AND WAVEFORMS

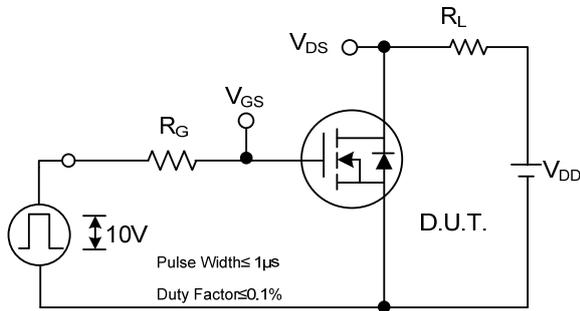


Peak Diode Recovery dv/dt Test Circuit

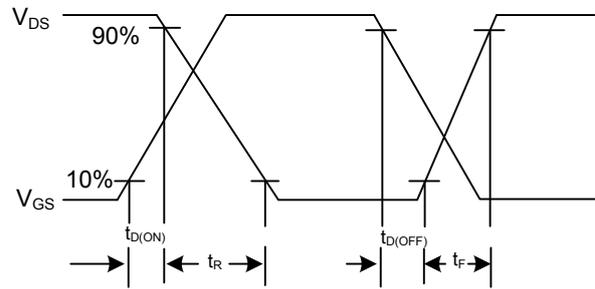


Peak Diode Recovery dv/dt Waveforms

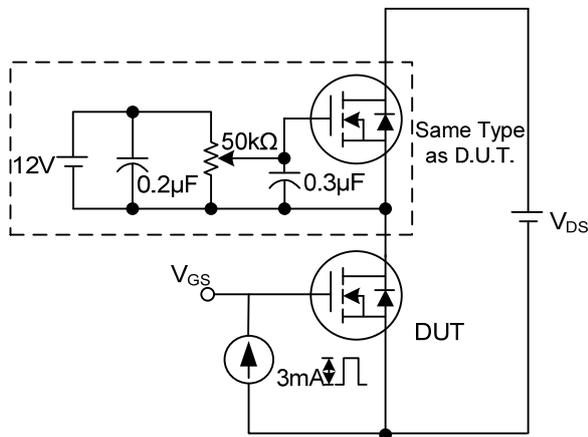
TEST CIRCUITS AND WAVEFORMS (Cont.)



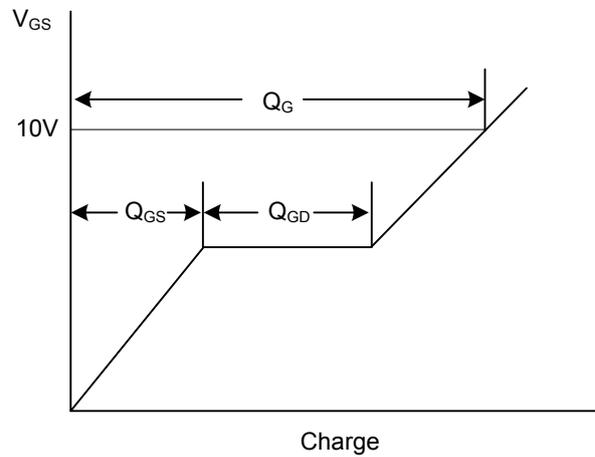
Switching Test Circuit



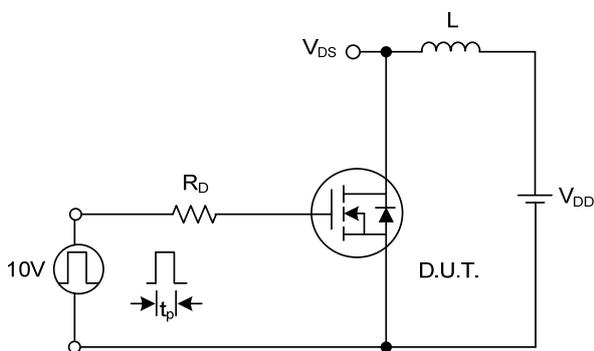
Switching Waveforms



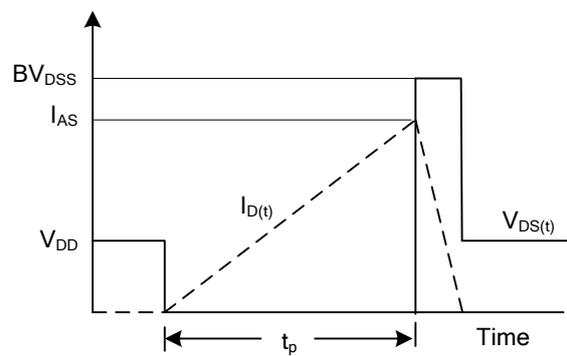
Gate Charge Test Circuit



Gate Charge Waveform



Unclamped Inductive Switching Test Circuit



Unclamped Inductive Switching Waveforms



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