



MOT80N03C/MOT80N03D N-CHANNEL MOSFET

■ PRODUCT CHARACTERISTICS

VDSS	30V
$R_{DS(on)}$ typ.(@ $V_{GS}=4.5V$)	9m Ω
$R_{DS(on)}$ typ.(@ $V_{GS}=10V$)	4.5m Ω
ID	80A

■ APPLICATIONS

This is suitable for the most demanding DC-DC converter application where high efficiency is to be achieved.

■ FEATURES

- * Fast switching capability
- * Avalanche energy tested
- * Improved dv/dt capability, high ruggedness

■ ORDER INFORMATION

Order codes		Package	Packing
Halogen-Free	Halogen		
N/A	MOT80N03D	TO-252	2500 pieces /Reel
N/A	MOT80N03C	TO-251	70 pieces/Tube

■ ABSOLUTE MAXIMUM RATINGS ($T_c = 25^\circ\text{C}$, unless otherwise specified)

PARAMETER	SYMBOL	RATINGS	UNIT
Drain-Source Voltage	V_{DSS}	30	V
Gate-Source Voltage	V_{GSS}	± 20	V
Continuous Drain Current	I_D	80	A
Pulsed Drain Current (Note 2)	I_{DM}	160	A
Avalanche Energy	E_{AS}	205	mJ
Peak Diode Recovery dv/dt (Note 3)	dv/dt	4.8	V/ns
Power Dissipation	P_D	96	W
Junction Temperature	T_J	+150	$^\circ\text{C}$
Storage Temperature Range	T_{STG}	-55 ~ +150	$^\circ\text{C}$

Notes: 1. Absolute maximum ratings are those values beyond which the device could be permanently damaged.

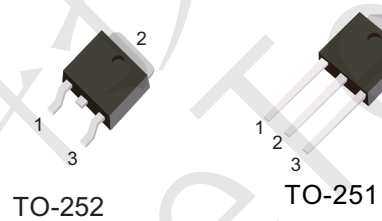
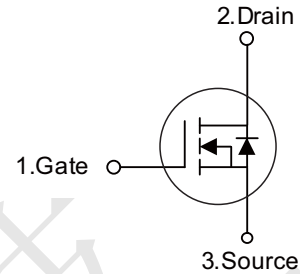
Absolute maximum ratings are stress ratings only and functional device operation is not implied.

2. Repetitive rating; pulse width limited by max. junction temperature.

3. $L=0.1\text{mH}$, $I_{AS}=64\text{A}$, $V_{DD}=50\text{V}$, $R_G=25\Omega$, Starting $T_J=25^\circ\text{C}$

4. $I_{SD} \leq 30\text{A}$, $di/dt \leq 200\text{A}/\mu\text{s}$, $V_{DD} \leq BV_{DSS}$, starting $T_J=25^\circ\text{C}$

Symbol





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■ ELECTRICAL CHARACTERISTICS ($T_c=25^\circ\text{C}$, unless otherwise noted)

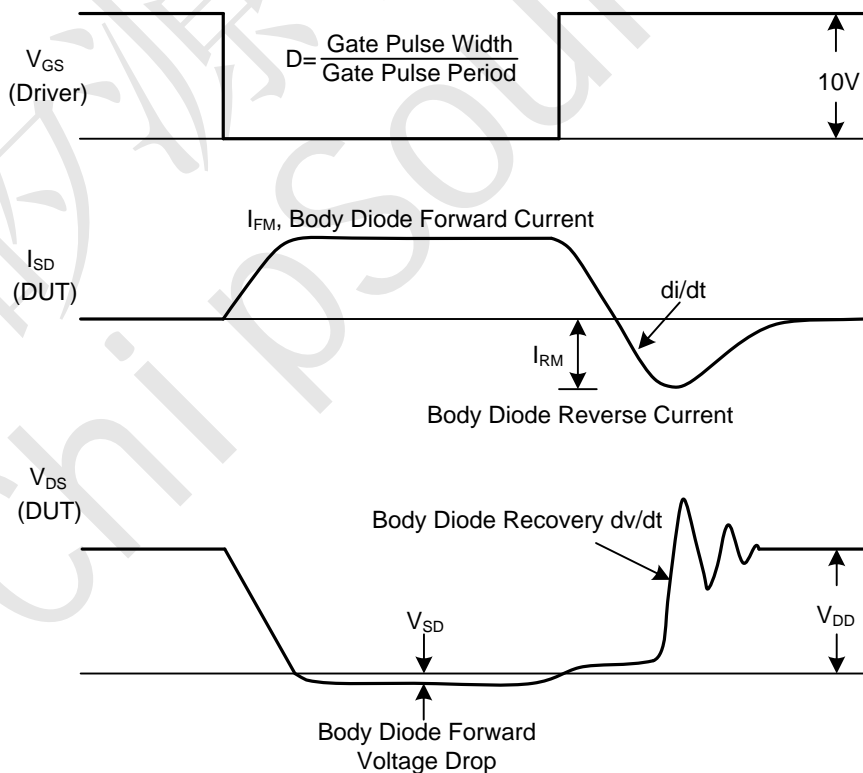
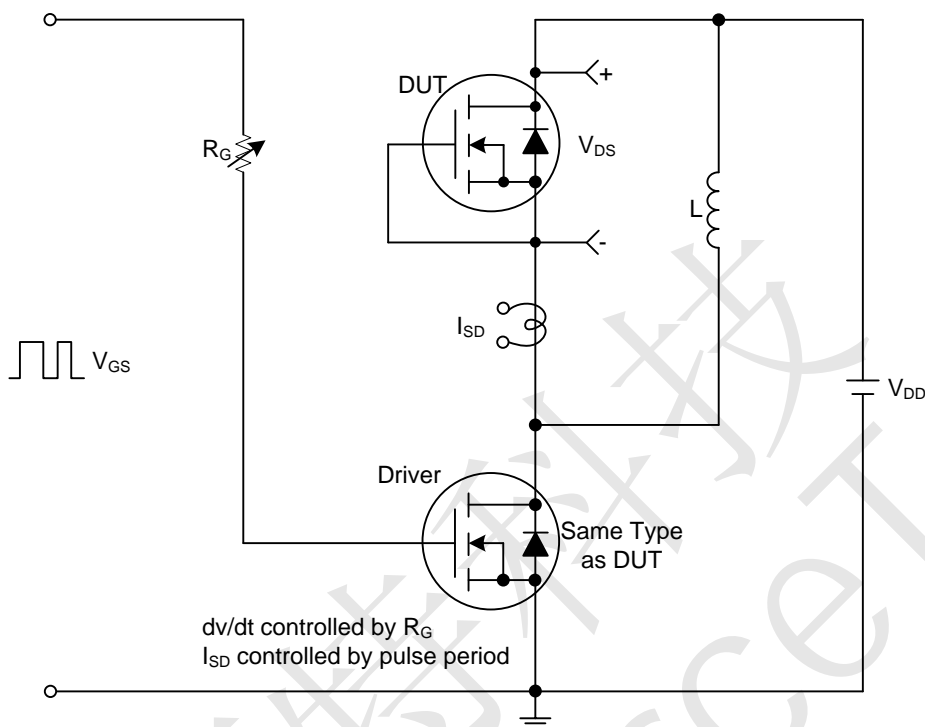
PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Static parameters						
Drain-Source Breakdown Voltage	BV_{DSS}	$V_{GS}=0V, I_D=250\mu A$	30	-	-	V
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS}=30V, V_{GS}=0V$	-	-	1	μA
		$V_{DS}=30V, V_{GS}=0V, T_J=125^\circ C$	-	-	250	μA
Gate-Source Leakage Current	I_{GSS}	$V_{GS}=\pm 20V, V_{DS}=0V$	-	-	± 100	nA
On characteristics						
Gate Threshold Voltage	$V_{GS(TH)}$	$V_{DS}=V_{GS}, I_D=250\mu A$	1.0	-	3.0	V
Static Drain-Source On-State Resistance	$R_{DS(ON)}$	$V_{GS}=10V, I_D=40A$	-	4.5	6	m Ω
		$V_{GS}=4.5V, I_D=20A$	-	9	12	m Ω
Dynamic parameters						
Input Capacitance	C_{ISS}	$V_{GS}=0V, V_{DS}=25V, f=1.0MHz$	-	4600	-	pF
Output Capacitance	C_{OSS}		-	570	-	pF
Reverse Transfer Capacitance	C_{RSS}		-	480	-	pF
Switching parameters						
Total Gate Charge (Note 1)	Q_G	$V_{DS}=15V, V_{GS}=10V, I_D=15A,$ $I_G=1mA$ (Note 1, 2)	-	98	-	nC
Gate to Source Charge	Q_{GS}		-	10	-	nC
Gate to Drain Charge	Q_{GD}		-	16	-	nC
Turn-ON Delay Time (Note 1)	$t_{D(ON)}$	$V_{DD}=15V, V_{GS}=10V, I_D=15A,$ $R_G=3\Omega$ (Note 1, 2)	-	30	-	ns
Turn-ON Rise Time	t_R		-	20	-	ns
Turn-OFF Delay Time	$t_{D(OFF)}$		-	85	-	ns
Turn-OFF Fall-Time	t_F		-	28	-	ns
Source-drain diode ratings and characteristics						
Maximum Body-Diode Continuous Current	I_S		-	-	80	A
Pulsed Source Current	I_{SM}		-	-	160	A
Diode Forward Voltage (Note 1)	V_{SD}	$I_S=80A, V_{GS}=0V$	-	-	1.4	V
Body Diode Reverse Recovery Time	t_{rr}	$I_F=30A, di/dt=100A/\mu s$	-	84	-	ns
Body Diode Reverse Recovery Charge	Q_{rr}	(Note 1, 2)	-	80	-	nC

Notes: 1. Pulse test; pulse width $\leq 300\mu s$, duty cycle $\leq 2\%$.
2. Essentially independent of operating temperature.



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■ TEST CIRCUITS AND WAVEFORMS

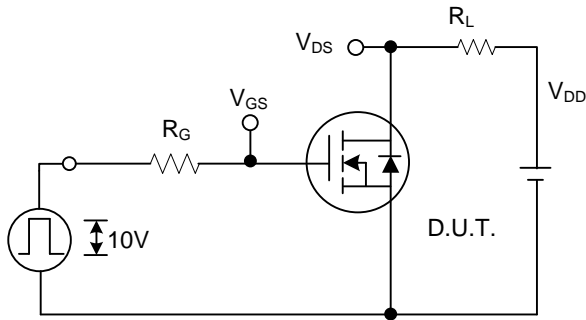


Peak Diode Recovery dv/dt Test Circuit and Waveforms

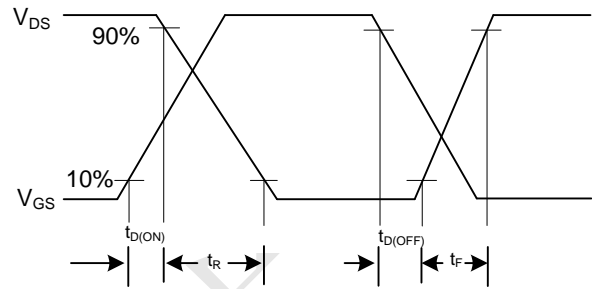


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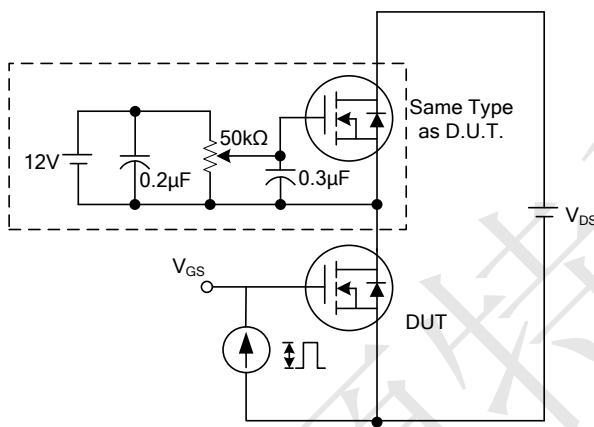
■ TEST CIRCUITS AND WAVEFORMS(Cont.)



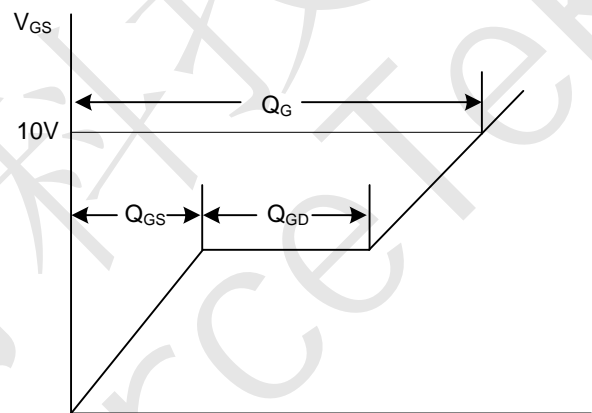
Switching Test Circuit



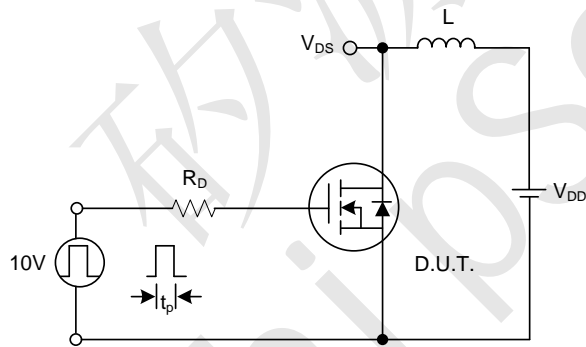
Switching Waveforms



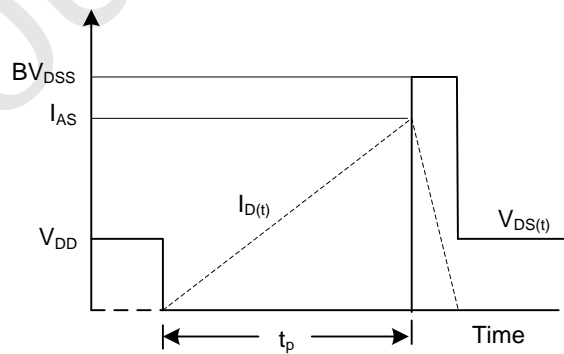
Gate Charge Test Circuit



Charge Gate Charge Waveform



Unclamped Inductive Switching Test Circuit

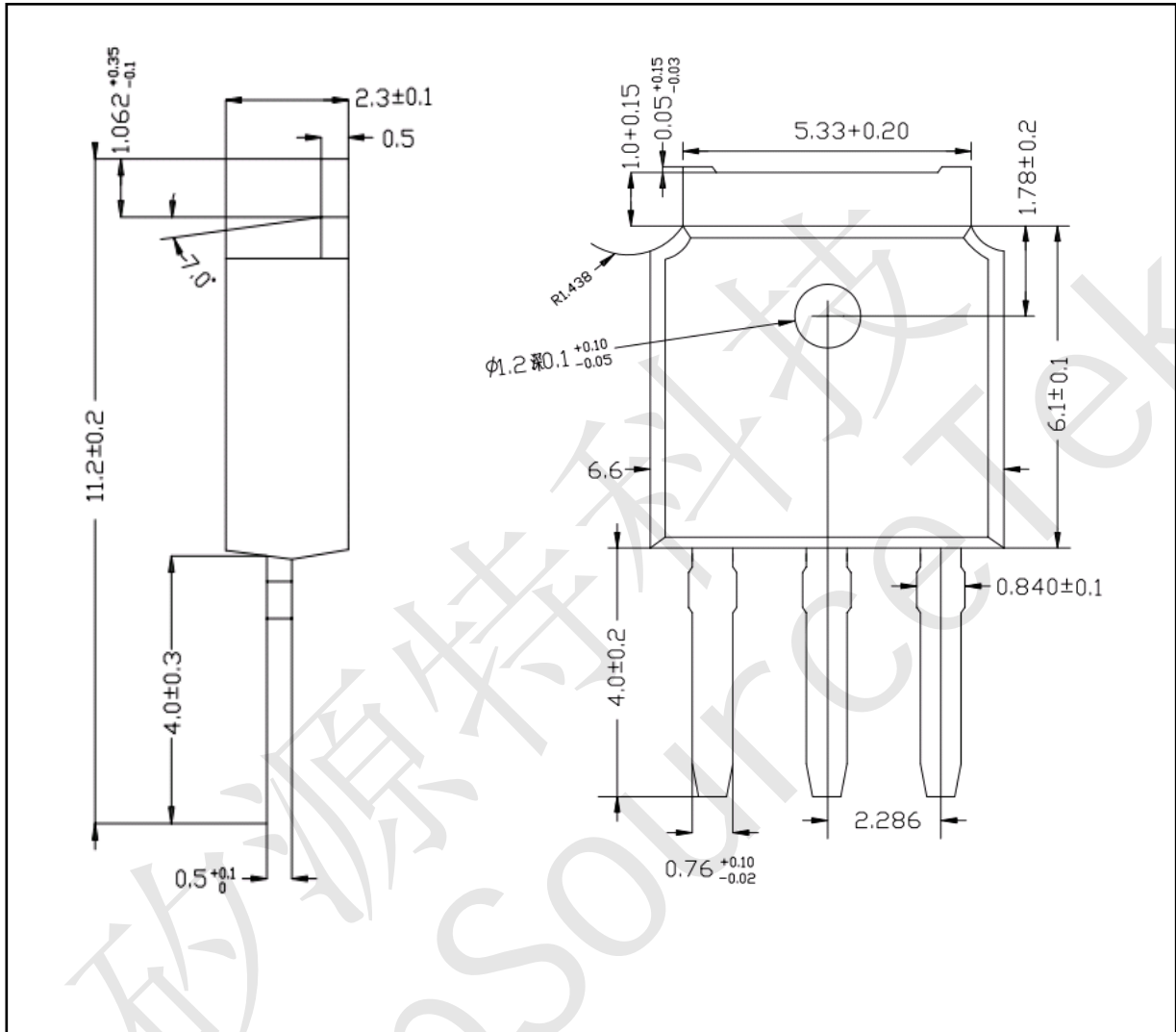


Unclamped Inductive Switching Waveforms



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■ TO-251 PACKAGE OUTLINE DIMENSIONS





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