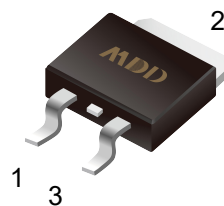


V_{DS}	600 V
$I_D(T_c=25^{\circ}\text{C})$	4A
$R_{DS(on),typ}$	$1.75\Omega @ V_{GS}=10V$
$Q_{g,typ}$	12nC



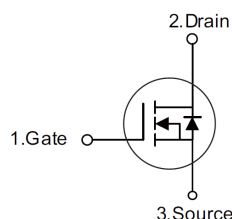
General Features

- Ultra low gate charge
- Low reverse transfer Capacitance
- Fast switching capability
- Avalanche energy tested
- Improved dv/dt capability, high ruggedness

Application

- High efficiency switch mode power supplies
- Electronic lamp ballasts based on half bridge
- LED power supplies

Equivalent Circuit



Absolute Maximum Ratings ($T_A=25^{\circ}\text{C}$ unless otherwise noted)

Parameter	Symbol	Value	Unit
Drain-Source Voltage	V_{DS}	600	V
Gate-Source Voltage	V_{GS}	± 30	V
Continuous Drain Current	I_D	4	A
Pulsed Drain Current(Note 1)	I_{DM}	16	A
Avalanche Energy Single Pulsed (Note 2)	E_{AS}	134	mJ
Continuous diode forward current	I_S	4	A
Diode pulse current	$I_{S,pulse}$	16	A
Peak Diode Recovery dv/dt (Note 3)	dv/dt	5	V/ns
Power Dissipation	P_D	100	W
Junction Temperature	T_J	150	$^{\circ}\text{C}$
Storage Temperature	T_{stg}	-55 ~150	$^{\circ}\text{C}$

Thermal Characteristics

Parameter	Symbol	Value	Unit
Thermal resistance, Junction-to-case	$R_{\theta JC}$	1.2	$^{\circ}\text{C/W}$
Thermal resistance, Junction-to-ambient	$R_{\theta JA}$	32.8	$^{\circ}\text{C/W}$

- Notes:**
1. Pulse width limited by maximum junction temperature.
 2. $L=10\text{mH}$, $I_{AS} = 5.2\text{A}$, Starting $T_J = 25^{\circ}\text{C}$.
 3. $I_{SD} = 4\text{A}$, $di/dt \leq 100\text{A/us}$, $V_{DD} \leq BV_{DS}$, Starting $T_J = 25^{\circ}\text{C}$.

**Ta = 25°C unless otherwise specified**

Symbol	Parameter		Condition	Min	Typ	Max	Unit
V_{(BR)DSS}	Drain-Source Breakdown Voltage		V_{GS}=0V, I_D=250μA	600	--	--	V
I_{GSS}	Gate-Source Leakage Current	Forward	V_{GS}=30V, V_{DS}=0V	--	--	100	nA
		Reverse	V_{GS}=-30V, V_{DS}=0V	--	--	-100	nA
I_{DSS}	Drain-Source Leakage Current		V_{DS}=600V, V_{GS}=0V	--	--	1	uA
V_{GS(TH)}	Gate Threshold Voltage		V_{DS}=V_{GS}, I_D=250μA	2.0	--	4.0	V
R_{DS(ON)}	Drain-Source On-State Resistance		V_{GS}=10V, I_D=2A	--	1.75	2.5	Ω

Dynamic Electrical Characteristics

Symbol	Parameter	Condition	Min	Typ	Max	Unit
C_{iss}	Input Capacitance	V_{DS}=25V V_{GS}=0V f=1MHz	--	600	--	pF
C_{oss}	Output Capacitance		--	61	--	pF
C_{rss}	Reverse Transfer Capacitance		--	10	--	pF
Q_g	Total Gate Charge	V_{DS}=300V, V_{GS}=10V, I_D=2A	--	12	--	nC
Q_{gs}	Gate Source Charge		--	3.2	--	nC
Q_{gd}	Gate Drain Charge		--	4.4	--	nC

Switching Characteristics

Symbol	Parameter	Condition	Min	Typ	Max	Unit
t_{d(on)}	Turn on Delay Time	V_{gs}= 10V V_{DS}=300V, I_D=2A, R_G=24Ω	--	12	--	ns
t_r	Turn on Rise Time		--	18	--	ns
t_{d(off)}	Turn Off Delay Time		--	49	--	ns
t_f	Turn Off Fall Time		--	27	--	ns

Source Drain Diode Characteristics

Symbol	Parameter	Condition	Min	Typ	Max	Unit
I_{SD}	Source drain current(Body Diode)		--	--	4	A
I_{SM}	Pulsed Current		--	--	16	A
V_{SD}	Drain-Source Diode Forward Voltage	I_S=4A, V_{GS}=0V	--	0.8	1.2	V
t_{rr}	Body Diode Reverse Recovery Time	V_R=400 I_F=4A, di/dt =100A/μs	--	290	--	ns
Q_{rr}	Body Diode Reverse Recovery Charge		--	0.8	--	uC

Electrical Characteristics Diagrams

Figure 1. Typical Output Characteristics

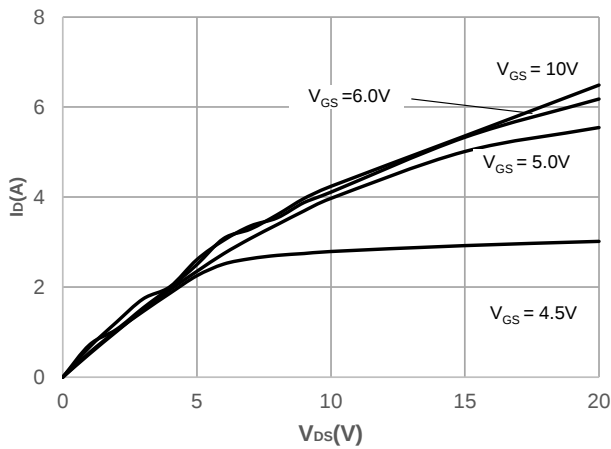


Figure 2. Transfer Characteristics

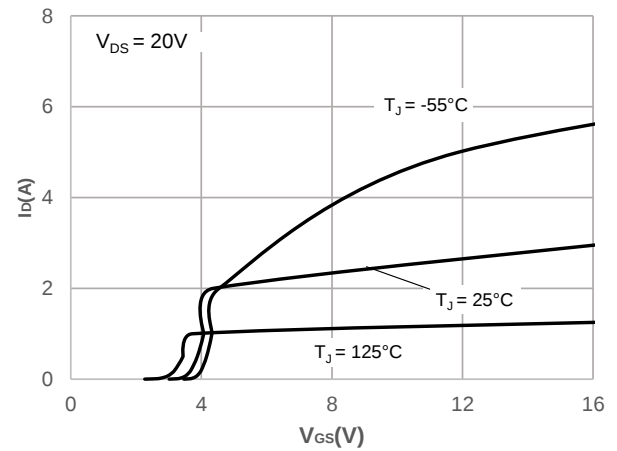


Figure 3. On-Resistance Variation vs. Drain Current

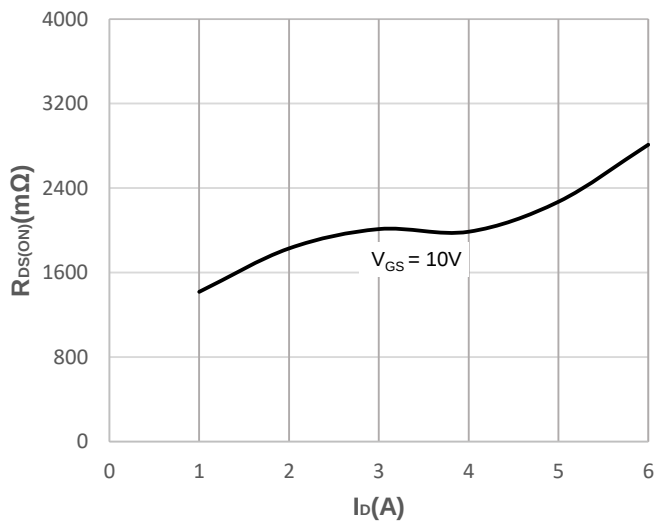


Figure 4. Body Diode Characteristics

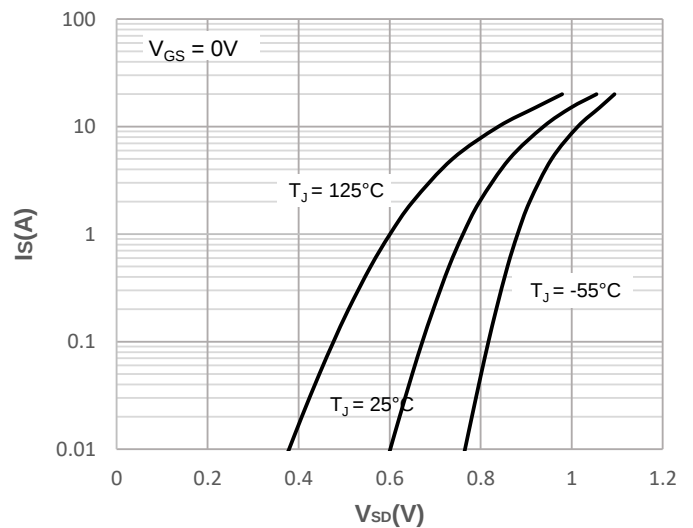


Figure 5. Breakdown Voltage vs. Temperature

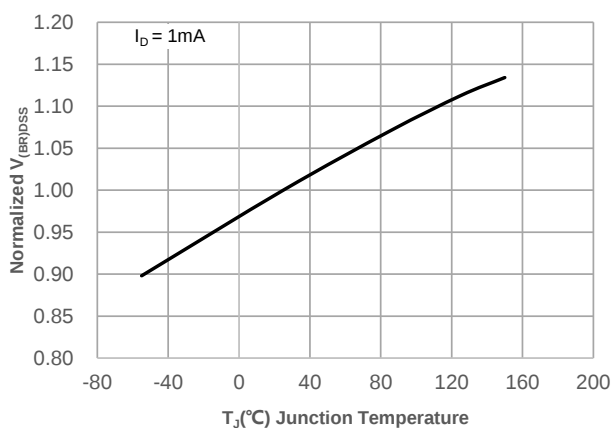
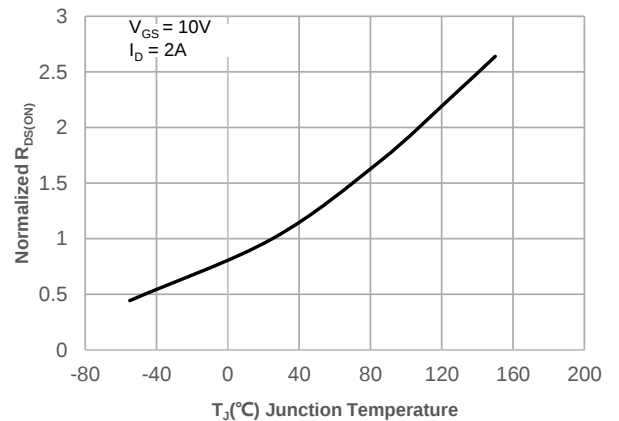
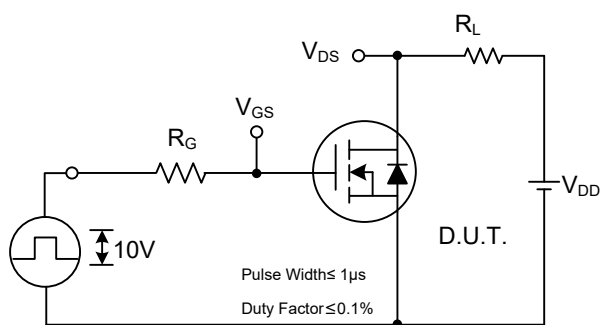
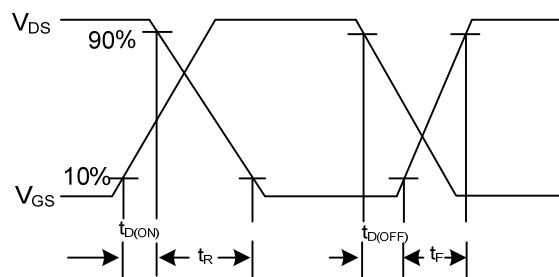


Figure 6. On-Resistance vs. Temperature

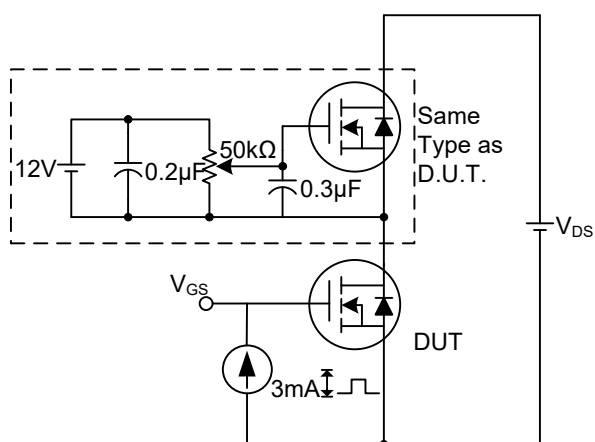




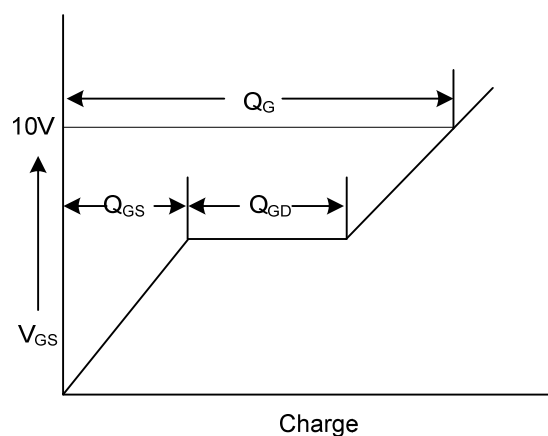
Switching Test Circuit



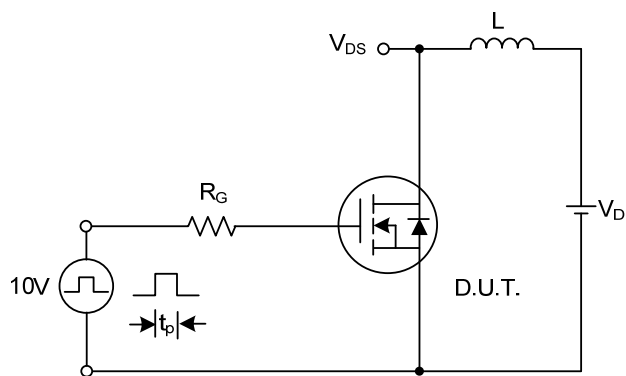
Switching Waveforms



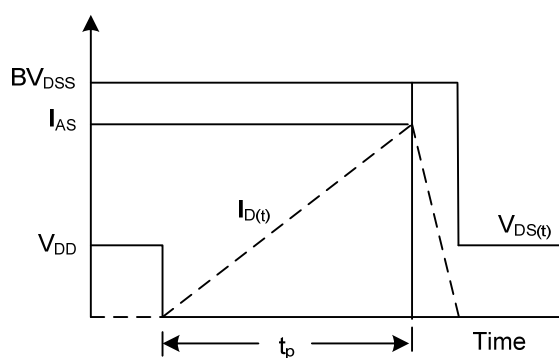
Gate Charge Test Circuit



Gate Charge Waveform



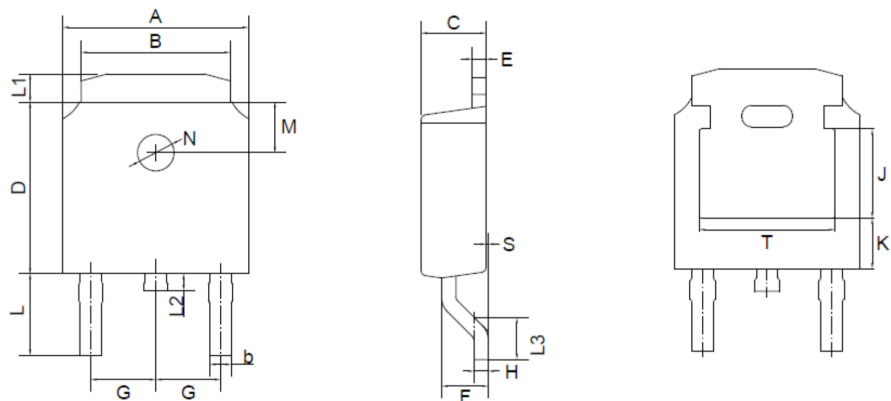
Unclamped Inductive Switching Test Circuit



Unclamped Inductive Switching Waveforms

The curve above is for reference only.

Mechanical Dimensions for TO-252



TO-252(D-PAK) mechanical data

UNIT		A	B	b	C	D	E	F	G	H	L	L1	L2	L3	S	M	N	J	K	T
mm	max	6.7	5.5	0.8	2.5	6.3	0.6	1.8	2.29	0.55	3.1	1.2	1.0	1.75	0.1	1.8	1.3	3.16	1.80	4.83
	min	6.3	5.1	0.3	2.1	5.9	0.4	1.3	TYPICAL	0.45	2.7	0.8	0.6	1.40	0.0	TYPICAL	TYPICAL	ref.	ref.	ref.
mil	max	264	217	31	98	248	24	71	90	22	122	47	39	69	4	71	51	124	71	190
	min	248	201	12	83	232	16	51	TYPICAL	18	106	31	24	55	0	TYPICAL	TYPICAL	ref.	ref.	ref.

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