

■ PRODUCT CHARACTERISTICS

VDSS	650V
$R_{DS(on)Typ}(V_{GS}=10V)$	1.15Ω
Qg@type	29nC
ID	7A

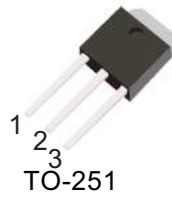
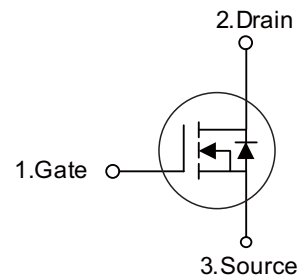
■ APPLICATIONS

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

■ FEATURES

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

Symbol



■ ORDER INFORMATION

Order codes		Package	Packing
Halogen-Free	Halogen		
N/A	MOT7N65ED	TO-252	2500 pieces /Reel
N/A	MOT7N65EC	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}	650	V
Gate-Source Voltage		V_{GSS}	±30	V
Avalanche Current (Note 2)		I_{AR}	7	A
Drain Current	Continuous	I_D	7	A
	Pulsed (Note 2)	I_{DM}	29.6	A
Avalanche Energy	Single Pulsed (Note 3)	E_{AS}	530	mJ
	Repetitive (Note 2)	E_{AR}	14.2	mJ
Peak Diode Recovery dv/dt (Note 4)		dv/dt	4.5	V/ns
Power Dissipation		P_D	120	W
Junction Temperature		T_J	+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 maximum junction temperature

3. $L = 19.5\text{mH}$, $I_{AS} = 7\text{A}$, $V_{DD} = 50\text{V}$, $R_G = 25\Omega$, Starting $T_J = 25^\circ\text{C}$

4. $I_{SD} \leq 7\text{A}$, $di/dt \leq 200\text{A}/\mu\text{s}$, $V_{DD} \leq BV_{DSS}$, Starting $T_J = 25^\circ\text{C}$

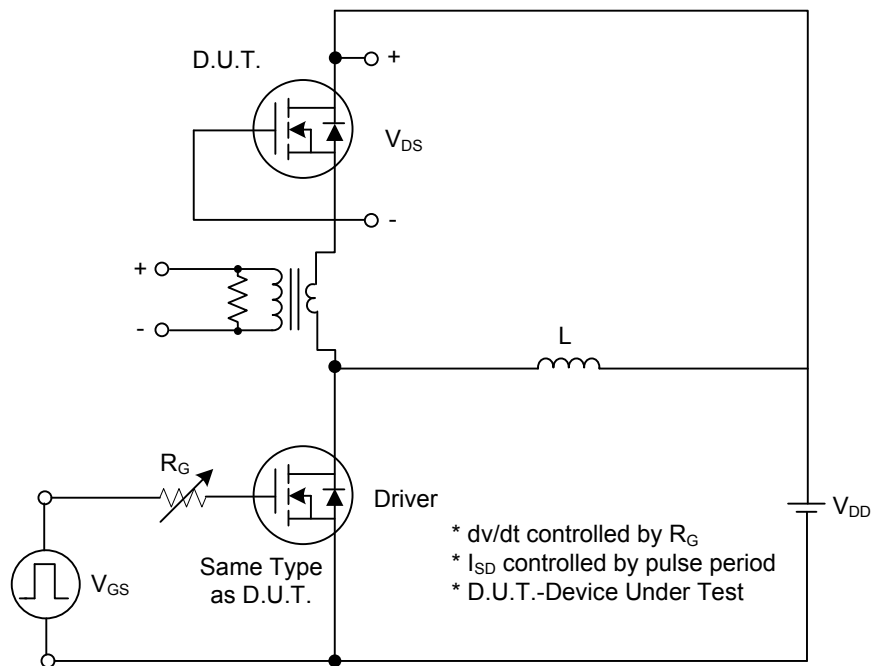
■ ELECTRICAL CHARACTERISTICS ($T_C = 25^\circ\text{C}$, unless otherwise specified)

PARAMETER		SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Drain-Source Breakdown Voltage		BV _{DSS}	V _{GS} = 0V, I _D = 250μA	650	-	-	V
Drain-Source Leakage Current		I _{DSS}	V _{DS} = 650V, V _{GS} = 0V	-	-	1	μA
Gate- Source Leakage Current	Forward	I _{GSS}	V _{GS} = 30V, V _{DS} = 0V	-	-	100	nA
	Reverse		V _{GS} = -30V, V _{DS} = 0V	-	-	-100	nA
Breakdown Voltage Temperature Coefficient		ΔBV _{DSS} / ΔT _J	I _D =250μA,Referenced to 25°C	-	0.67	-	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 = 3.5A	-	1.15	1.35	Ω
Dynamic characteristics							
Input Capacitance		C _{ISS}	V _{DS} =25V, V _{GS} =0V, f=1.0 MHz	-	1400	-	pF
Output Capacitance		C _{OSS}		-	180	-	pF
Reverse Transfer Capacitance		C _{RSS}		-	16	-	pF
Switching characteristics							
Turn-On Delay Time		t _{D(ON)}	V _{DD} =325V, I _D =7.4A, R _G =25Ω (Note 1, 2)	-	70	-	ns
Turn-On Rise Time		t _R		-	170	-	ns
Turn-Off Delay Time		t _{D(OFF)}		-	140	-	ns
Turn-Off Fall Time		t _F		-	130	-	ns
Switching characteristics							
Total Gate Charge		Q _G	V _{DS} =520V, I _D = 7A, V _{GS} =10 V (Note 1, 2)	-	29	-	nC
Gate-Source Charge		Q _{GS}		-	7	-	nC
Gate-Drain Charge		Q _{GD}		-	14.5	-	nC
Drain-source diode characteristics and maximum ratings							
Drain-Source Diode Forward Voltage		V _{SD}	V _{GS} = 0V, I _S = 7A	-	-	1.4	V
Maximum Continuous Drain-Source Diode Forward Current		I _S		-	-	7	A
Maximum Pulsed Drain-Source Diode Forward Current		I _{SM}		-	-	29.6	A
Reverse Recovery Time		t _{rr}	V _{GS} = 0V, I _S = 7A,	-	320	-	ns
Reverse Recovery Charge		Q _{RR}	dl _F / dt = 100A/μs (Note 1)	-	2.4	-	μC

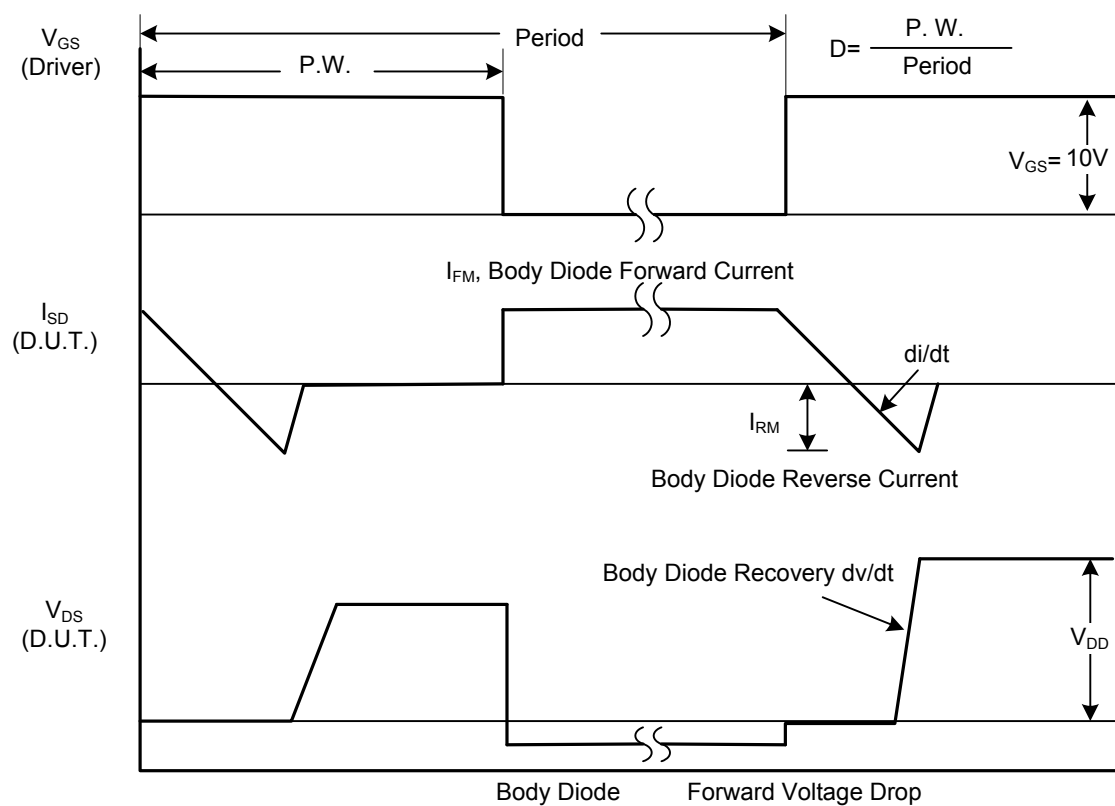
Notes: 1. Pulse Test: Pulse width $\leq 300\mu s$, Duty cycle $\leq 2\%$

2. Essentially independent of operating temperature

■ TYTEST CIRCUITS AND WAVEFORMS

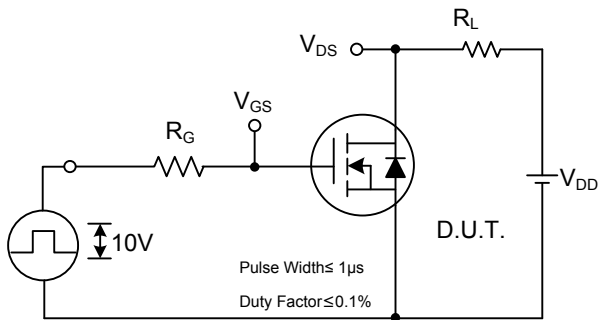


Peak Diode Recovery dv/dt Test Circuit

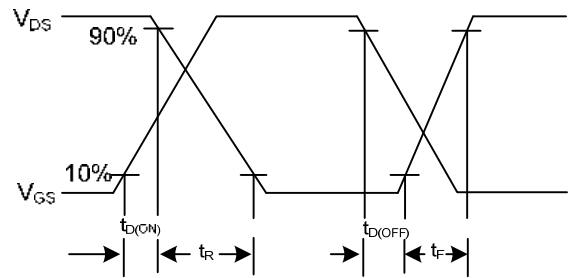


Peak Diode Recovery dv/dt Waveforms

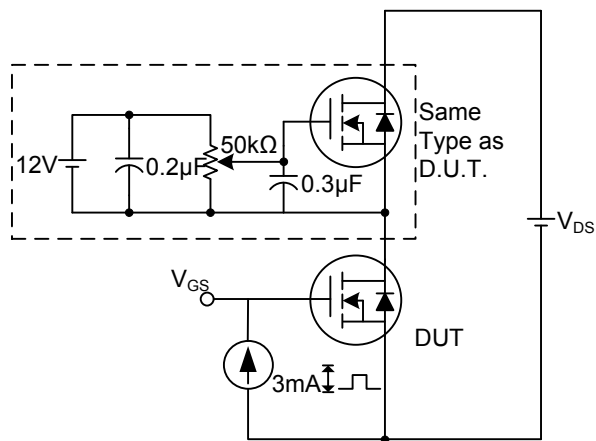
■ TYTEST CIRCUITS AND WAVEFORMS(Cont.)



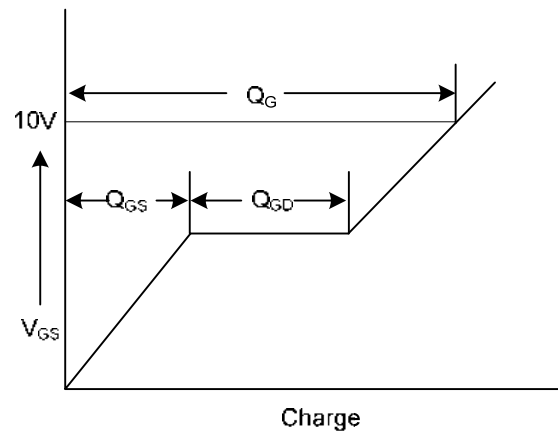
Switching Test Circuit



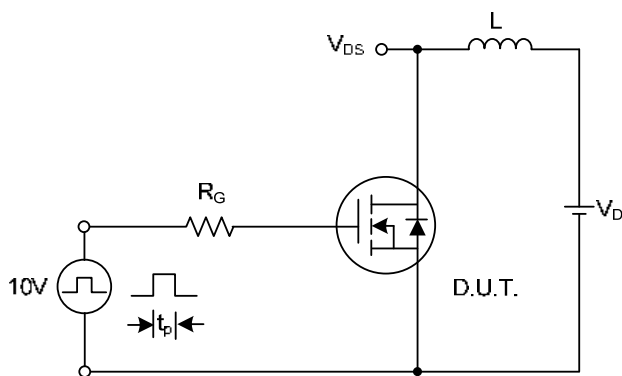
Switching Waveforms



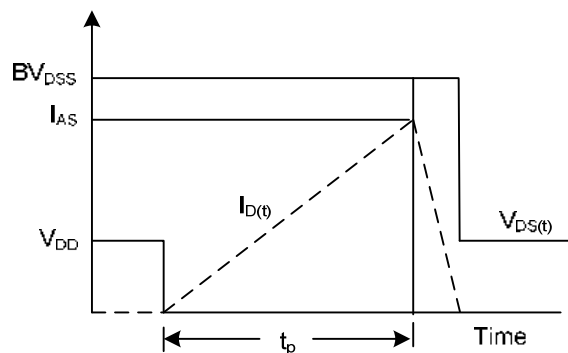
Gate Charge Test Circuit



Gate Charge Waveform



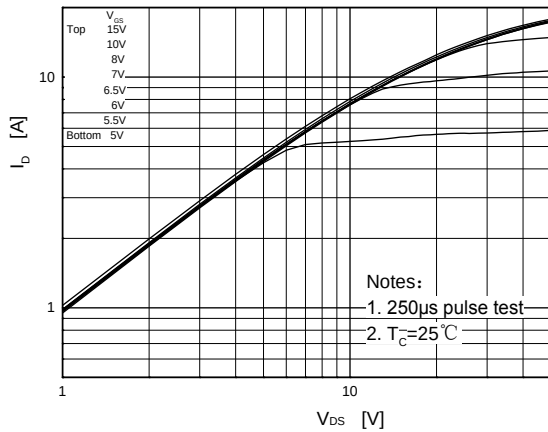
Unclamped Inductive Switching Test Circuit



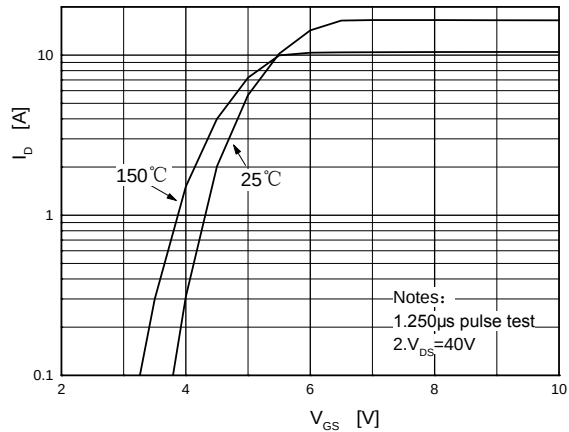
Unclamped Inductive Switching Waveforms

■ TYPICAL CHARACTERISTICS

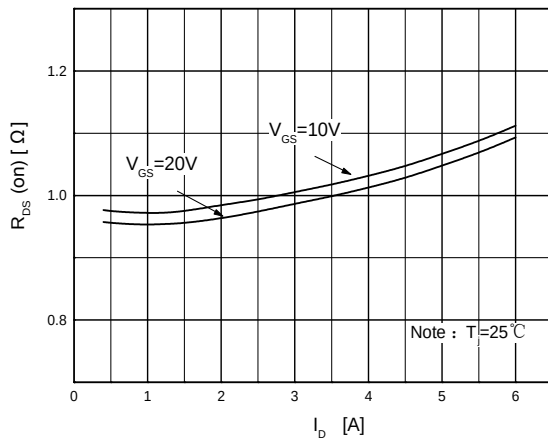
On-Region Characteristics



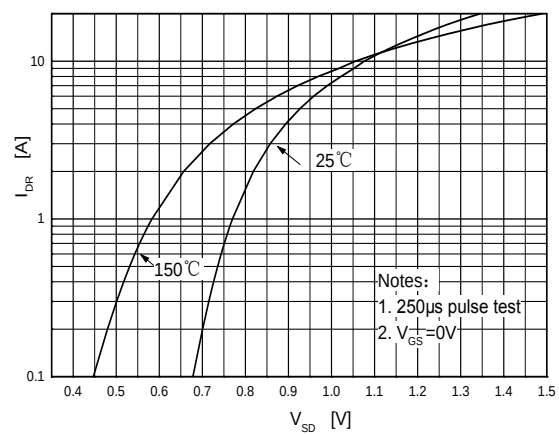
Transfer Characteristics



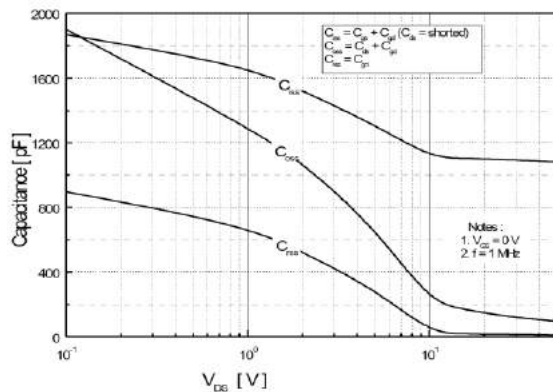
On-Resistance Variation vs. Drain Current and Gate Voltage



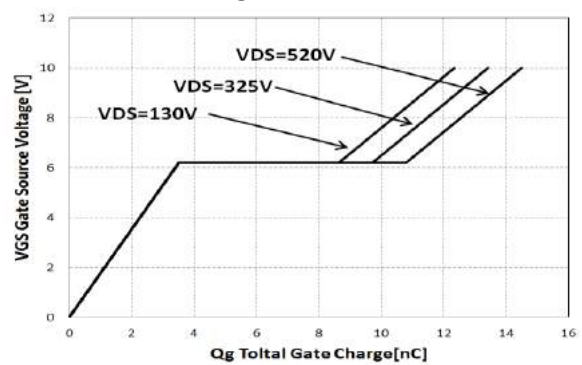
Body Diode Forward Voltage Variation vs. Source Current and Temperature



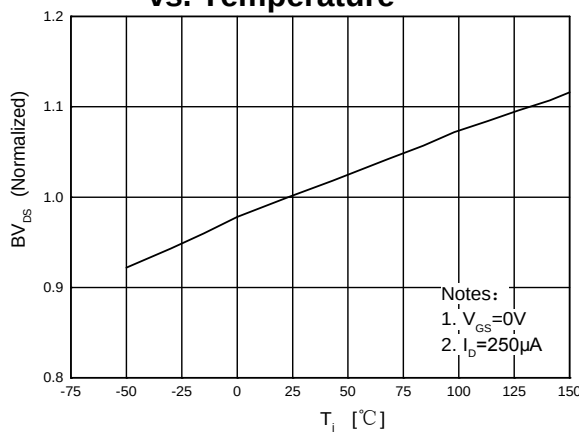
Capacitance Characteristics



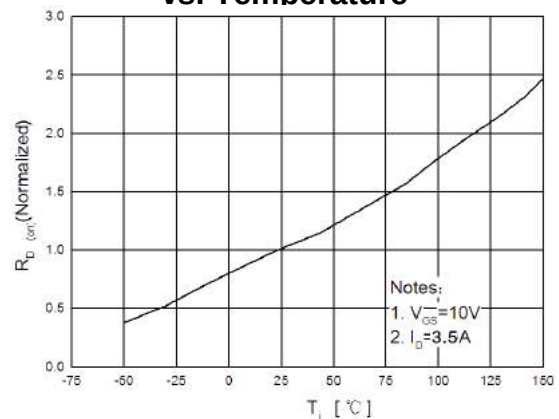
Gate Charge Characteristics



Breakdown Voltage Variation vs. Temperature



On-Resistance Variation vs. Temperature



■ TO-252 PACKAGE OUTLINE DIMENSIONS

