

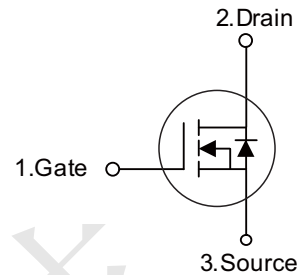


MOT7N65EC/MOT7N65ED N-CHANNEL MOSFET

■ PRODUCT CHARACTERISTICS

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

Symbol

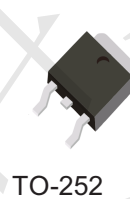


■ APPLICATIONS

- 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



■ 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
	Pulsed (Note 2)	I_{DM}	29.6
Avalanche Energy	Single Pulsed (Note 3)	E_{AS}	530
	Repetitive (Note 2)	E_{AR}	14.2
Peak Diode Recovery dv/dt (Note 4)	dv/dt	4.5	V/ns
Power Dissipation	TO-252/251	P_D	120
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 $T_J = 25^\circ\text{C}$



MOT7N65EC/MOT7N65ED N-CHANNEL MOSFET

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

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
OFF CHARACTERISTICS						
Drain-Source Breakdown Voltage	BV_{DSS}	$V_{GS} = 0V, I_D = 250\mu A$	650			V
Drain-Source Leakage Current	I_{DSS}	$V_{DS} = 650V, V_{GS} = 0V$			1	μA
Gate- Source Leakage Current	Forward	I_{GSS}			100	nA
	Reverse				-100	nA
Breakdown Voltage Temperature Coefficient	$\Delta BV_{DSS} / \Delta T_J$	$I_D=250\mu A$, Referenced to 25°C		0.67		$V/^\circ\text{C}$
ON CHARACTERISTICS						
Gate Threshold Voltage	$V_{GS(TH)}$	$V_{DS} = V_{GS}, I_D = 250\mu A$	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}	$V_{DS}=25V, V_{GS}=0V,$ $f=1.0\text{ MHz}$			1400	pF
Output Capacitance	C_{OSS}				180	pF
Reverse Transfer Capacitance	C_{RSS}			16	21	pF
SWITCHING CHARACTERISTICS						
Turn-On Delay Time	$t_{D(ON)}$	$V_{DD}=325V, I_D=7.4A,$ $R_G=25\Omega$ (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	$V_{DS}=520V, I_D=7A,$ $V_{GS}=10V$ (Note 1, 2)		29	38	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}	$dI_F / dt = 100A/\mu s$ (Note 1)		2.4		μC

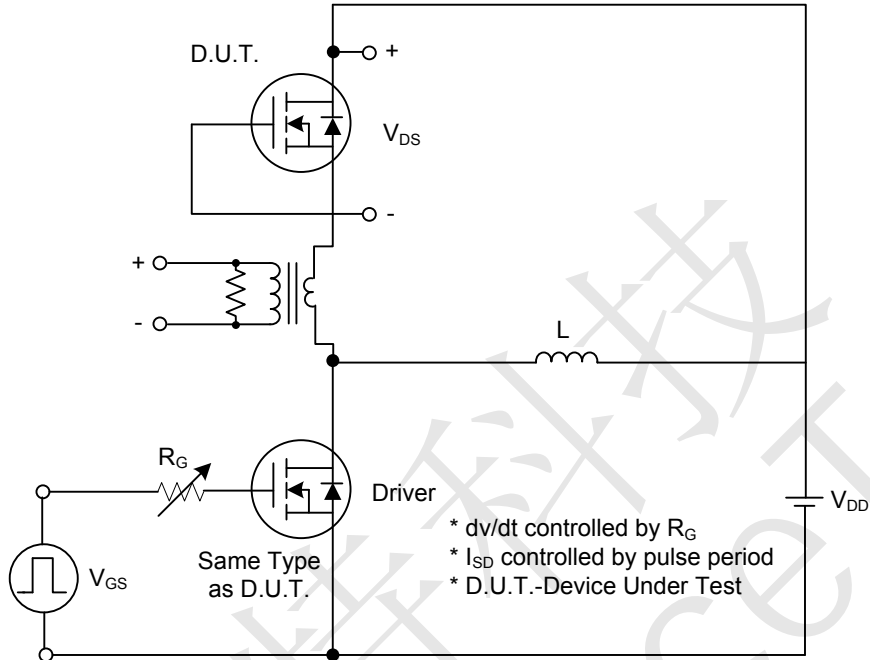
Notes: 1. Pulse Test: Pulse width $\leq 300\mu s$, Duty cycle $\leq 2\%$

2. Essentially independent of operating temperature

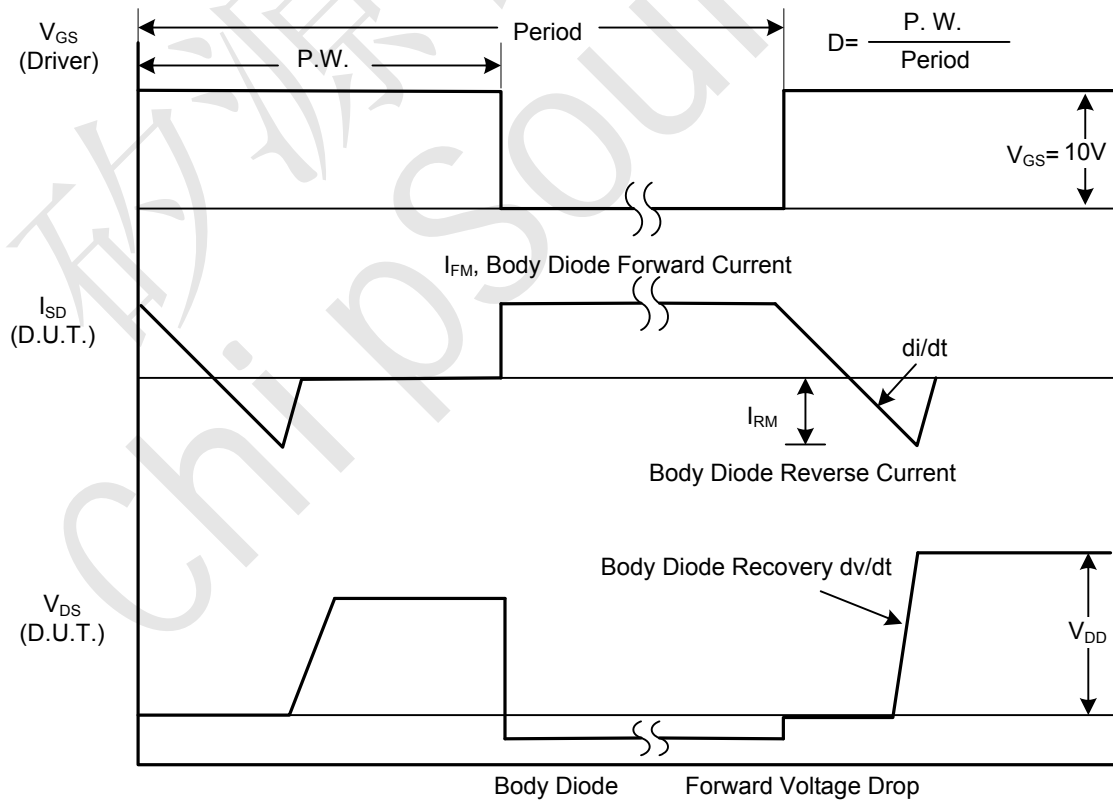


MOT7N65EC/MOT7N65ED N-CHANNEL MOSFET

■ TYTEST CIRCUITS AND WAVEFORMS



Peak Diode Recovery dv/dt Test Circuit

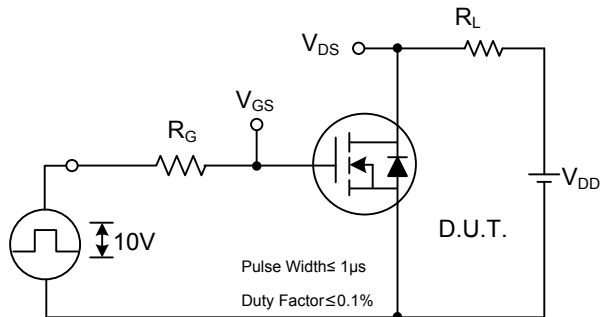


Peak Diode Recovery dv/dt Waveforms

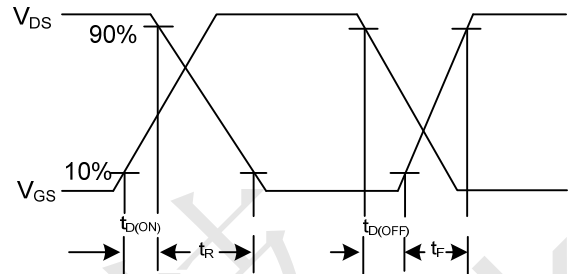


MOT7N65EC/MOT7N65ED N-CHANNEL MOSFET

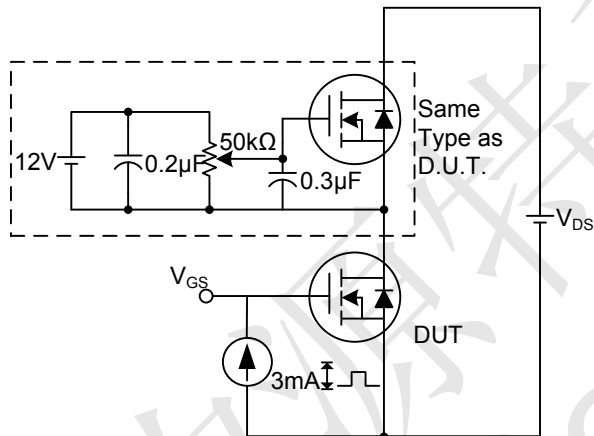
■ TYTEST CIRCUITS AND WAVEFORMS(Cont.)



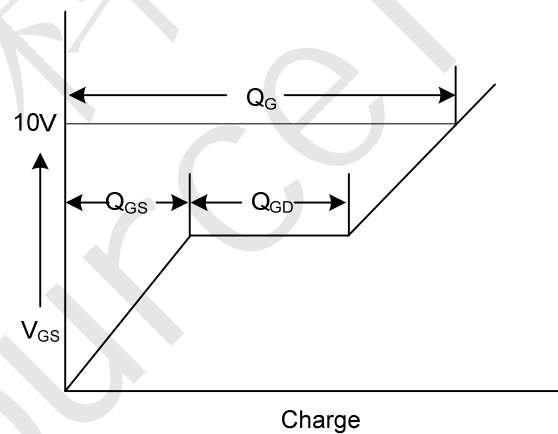
Switching Test Circuit



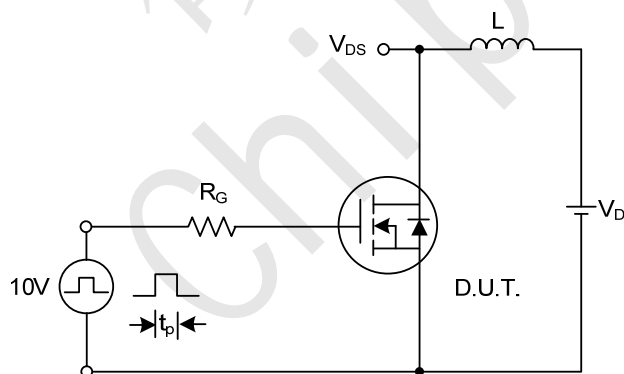
Switching Waveforms



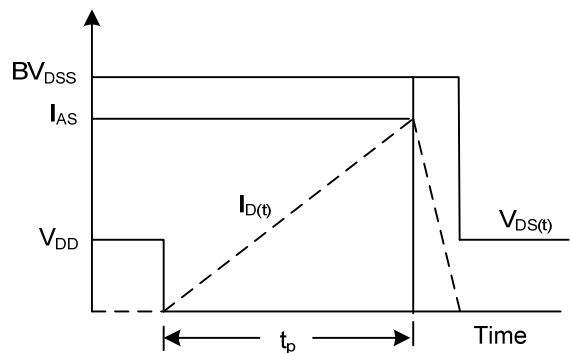
Gate Charge Test Circuit



Gate Charge Waveform



Unclamped Inductive Switching Test Circuit



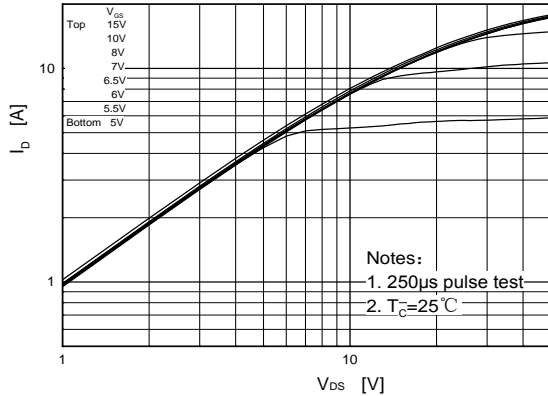
Unclamped Inductive Switching Waveforms



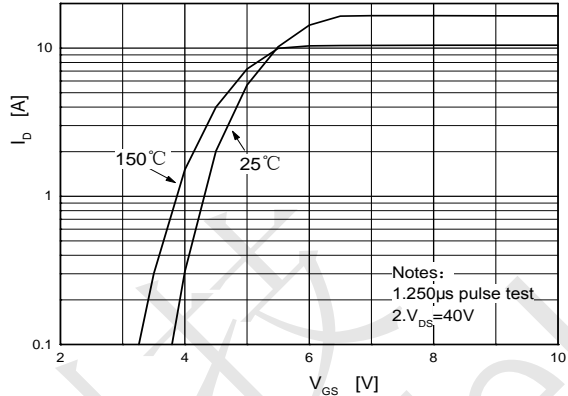
MOT7N65EC/MOT7N65ED N-CHANNEL MOSFET

■ TYPICAL CHARACTERISTICS

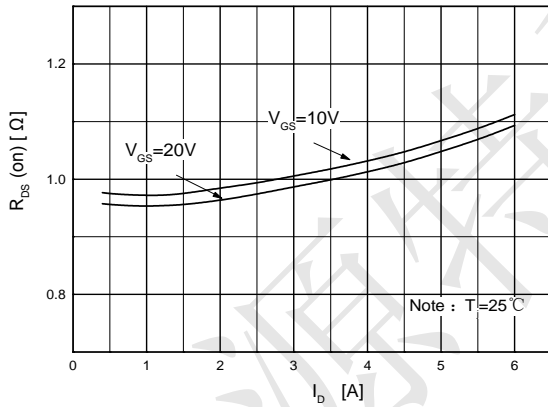
On-Region Characteristics



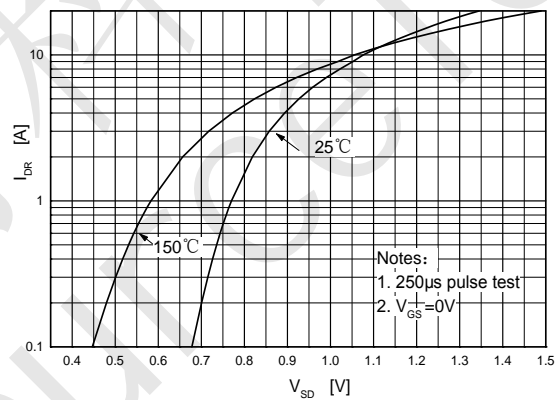
Transfer Characteristics



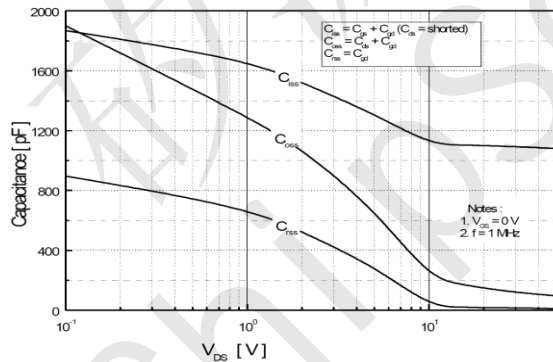
On-Resistance Variation vs. Drain Current and Gate Voltage



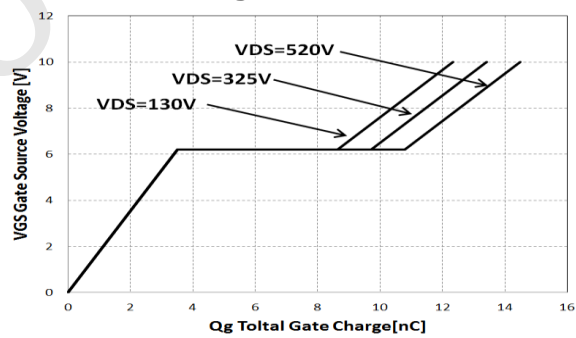
Body Diode Forward Voltage Variation vs. Source Current and Temperature



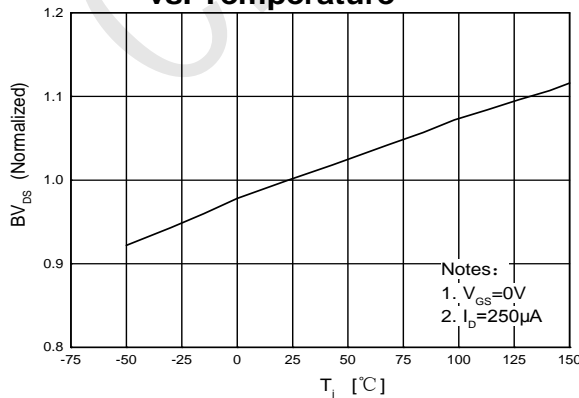
Capacitance Characteristics



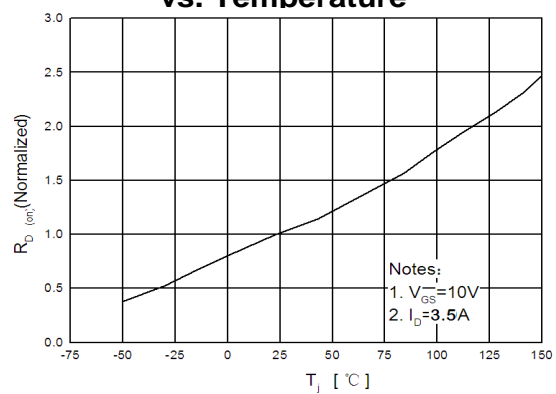
Gate Charge Characteristics



Breakdown Voltage Variation vs. Temperature



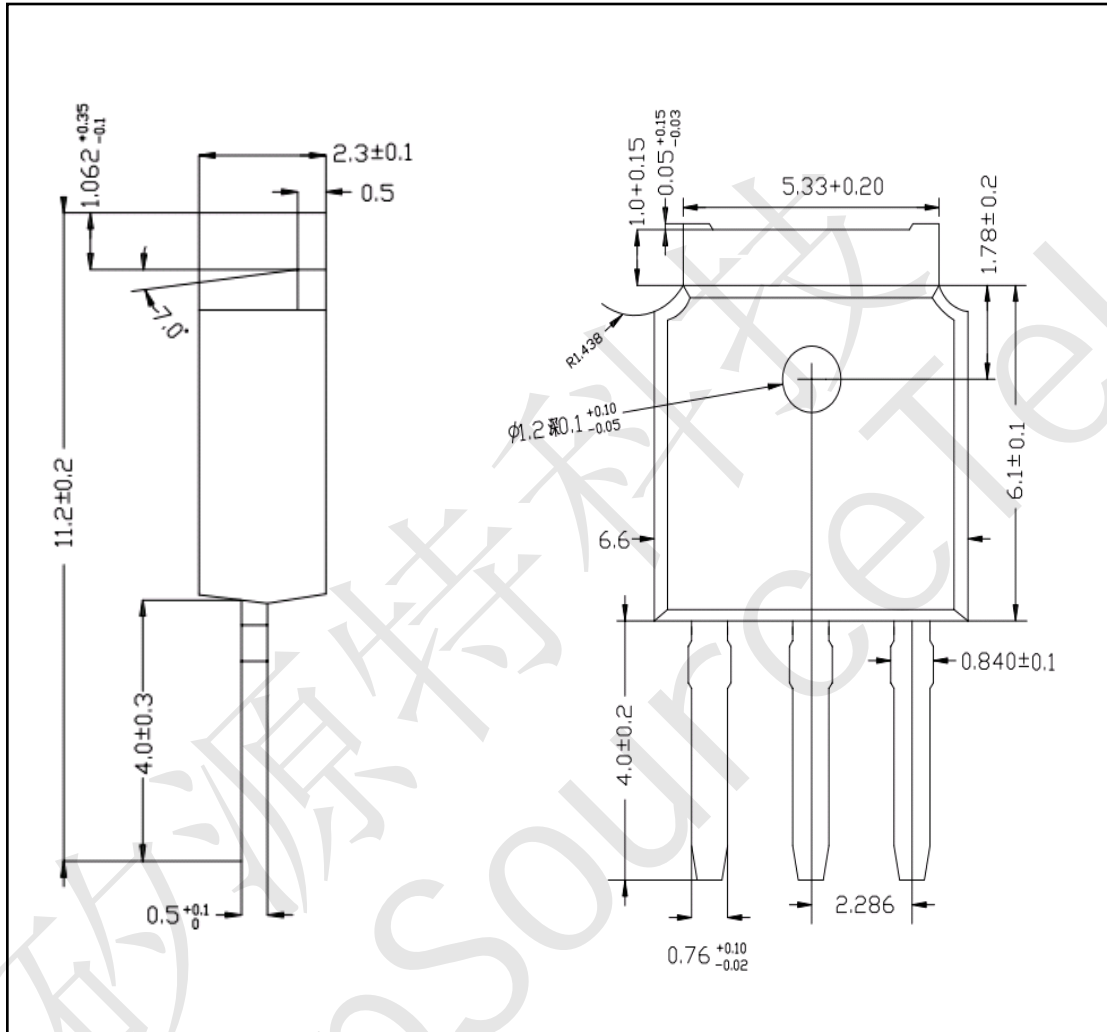
On-Resistance Variation vs. Temperature





MOT7N65EC/MOT7N65ED N-CHANNEL MOSFET

■ TO-251-3L PACKAGE OUTLINE DIMENSIONS





MOT7N65EC/MOT7N65ED N-CHANNEL MOSFET

■ TO-252-2L PACKAGE OUTLINE DIMENSIONS

