

EVVOSEMI[®]

THINK CHANGE DO



ESD



TVS



MOS



LDO



Diode



Sensor



DC-DC

Product Specification

▶ Domestic	Part Number	7N65
▶ Overseas	Part Number	7N65
▶ Equivalent	Part Number	7N65

EV is the abbreviation of name EVVO

N-CHANNEL MOSFET

PRODUCT CHARACTERISTICS

VDSS	650V
$R_{DS(on)max}(@V_{GS} = 10\text{ V})$	1.2Ω
Qg@type	29nC
ID	7A

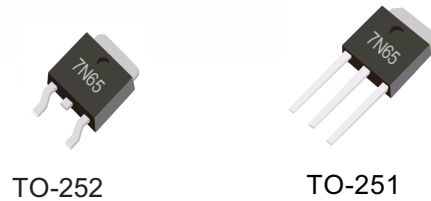
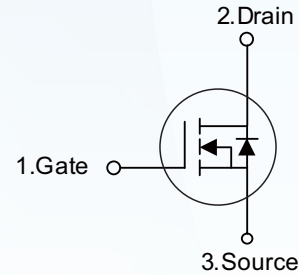
APPLICATIONS

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

FEATURES

- * $R_{DS(ON)} = 1.2\Omega @V_{GS} = 10\text{ V}$
- * Ultra low gate charge
- * Low reverse transfer Capacitance
- * Fast switching capability
- * Avalanche energy tested
- * Improved dv/dt capability, high ruggedness

Symbol



TO-252

TO-251

ORDER INFORMATION

Order codes		Package	Packing
Halogen-Free	Halogen		
N/A	7N65	TO-252	2500 pieces /Real
N/A	7N65	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	$^\circ\text{C}$
Storage Temperature	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 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 $T_J = 25^\circ\text{C}$

N-CHANNEL MOSFET

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

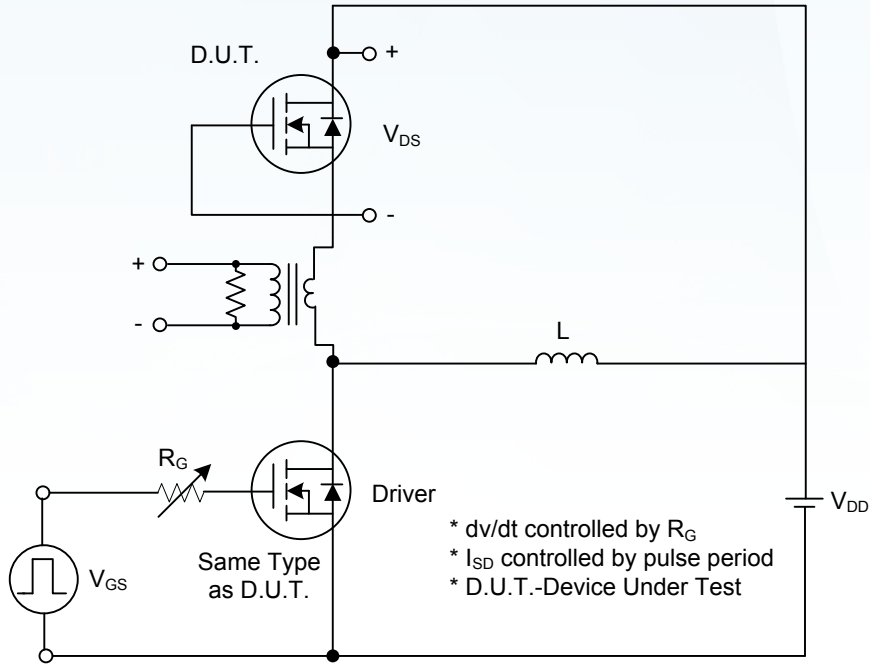
PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
OFF CHARACTERISTICS						
Drain-Source Breakdown Voltage	BV _{DSS}	V _{GS} = 0V, I _D = 250μA	650			V
Drain-Source Leakage Current	I _{DSS}	V _{DS} = 650V, V _{GS} = 0V			1	μA
Gate- Source Leakage Current	Forward	I _{GSS} V _{GS} = 30V, V _{DS} = 0V			100	nA
	Reverse		V _{GS} = -30V, V _{DS} = 0V			-100
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		0.94	1.2	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	21	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	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/μs (Note 1)		2.4		μC

Notes: 1. Pulse Test: Pulse width ≤ 300μs, Duty cycle ≤ 2%

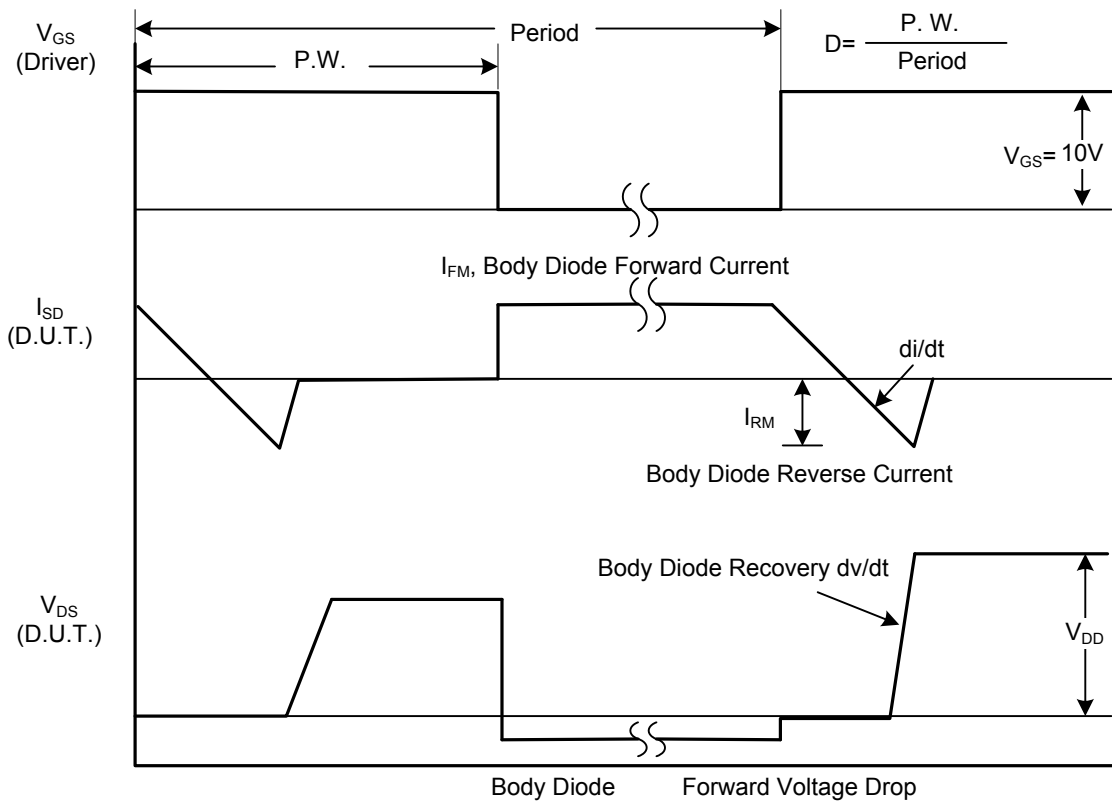
2. Essentially independent of operating temperature

N-CHANNEL MOSFET

■ TEST CIRCUITS AND WAVEFORMS



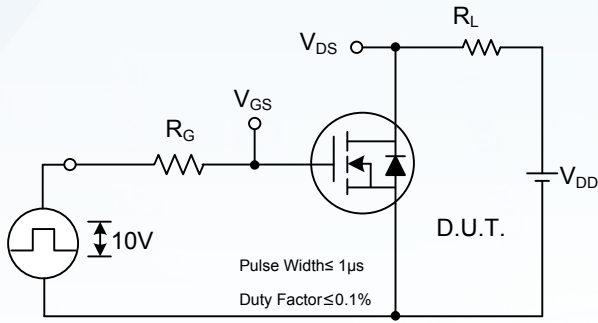
Peak Diode Recovery dv/dt Test Circuit



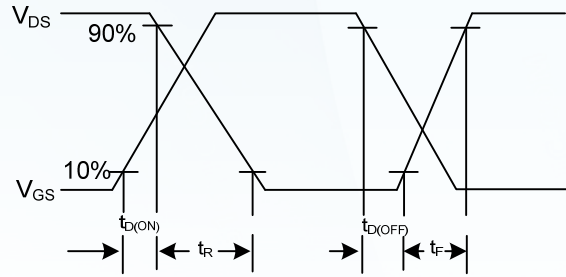
Peak Diode Recovery dv/dt Waveforms

N-CHANNEL MOSFET

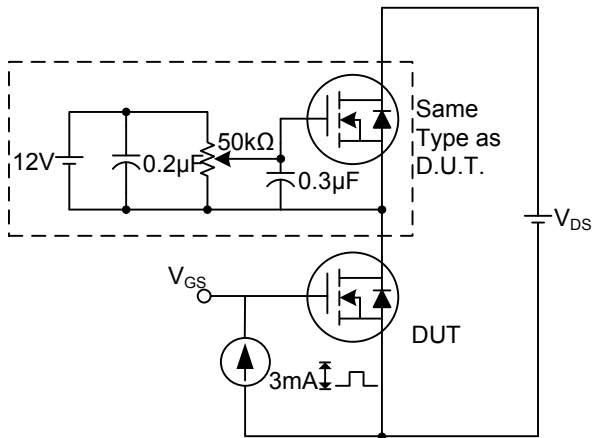
TEST CIRCUITS AND WAVEFORMS (Cont.)



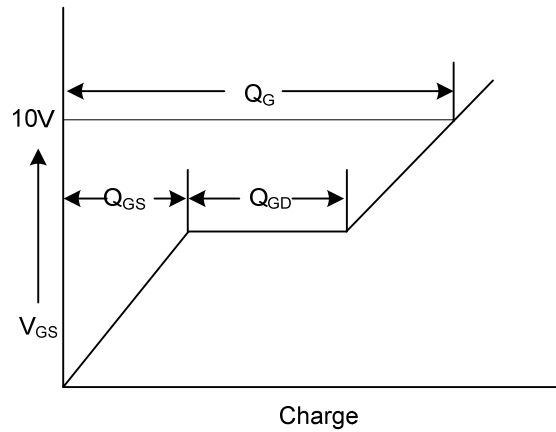
Switching Test Circuit



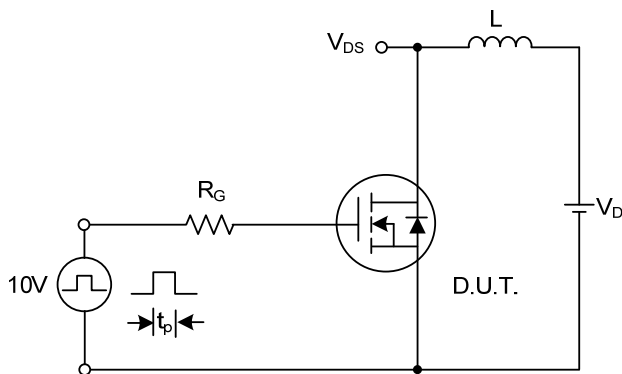
Switching Waveforms



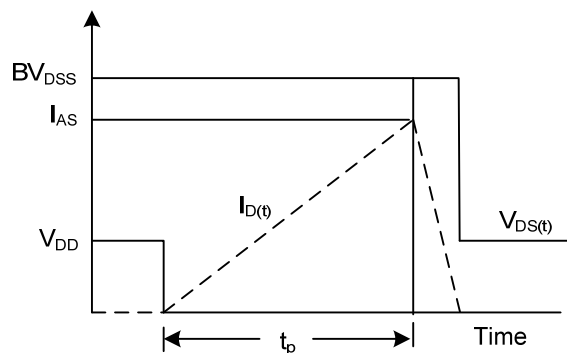
Gate Charge Test Circuit



Gate Charge Waveform



Unclamped Inductive Switching Test Circuit

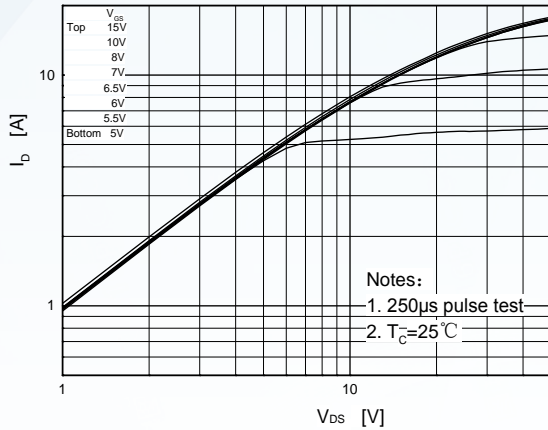


Unclamped Inductive Switching Waveforms

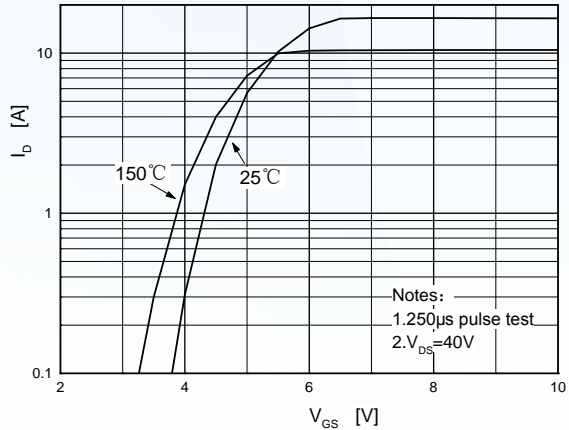
■ ELECTRICAL CHARACTERISTICS

N-CHANNEL MOSFET

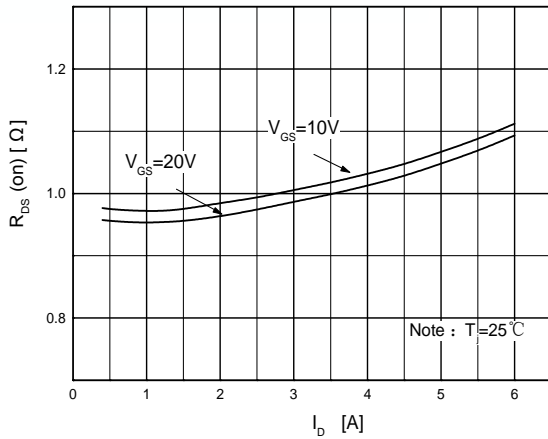
On-Region Characteristics



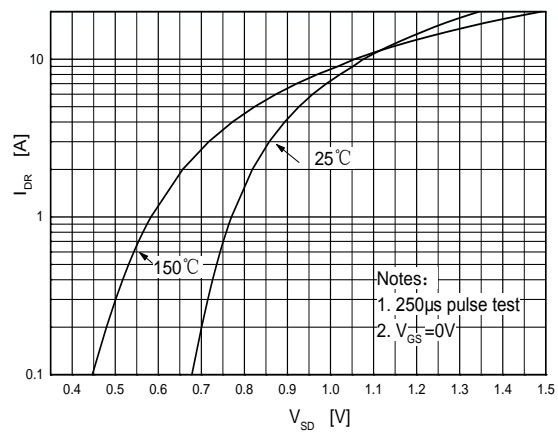
Transfer Characteristics



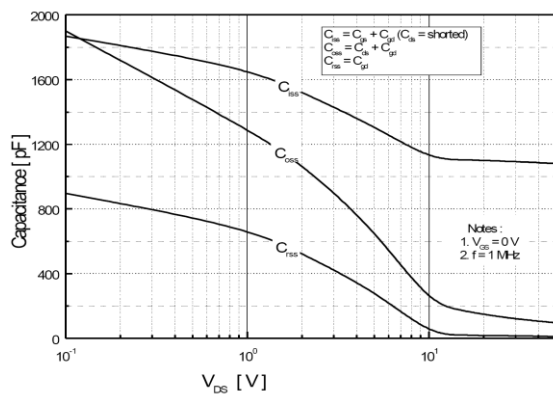
On-Resistance Variation vs. Drain Current and Gate Voltage



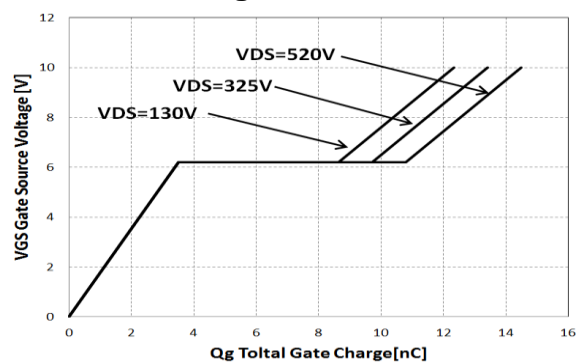
Body Diode Forward Voltage Variation vs. Source Current and Temperature



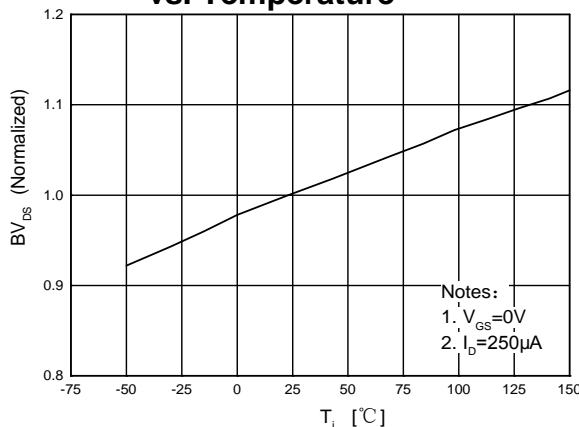
Capacitance Characteristics



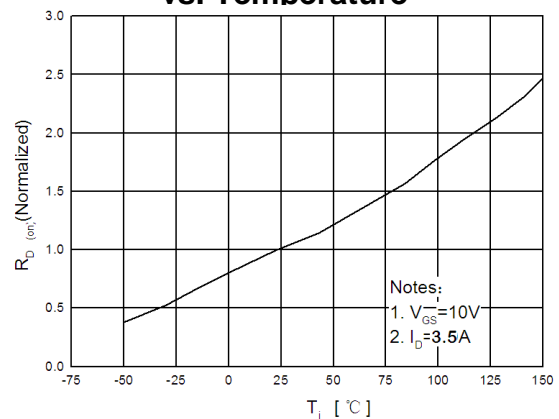
Gate Charge Characteristics



Breakdown Voltage Variation vs. Temperature

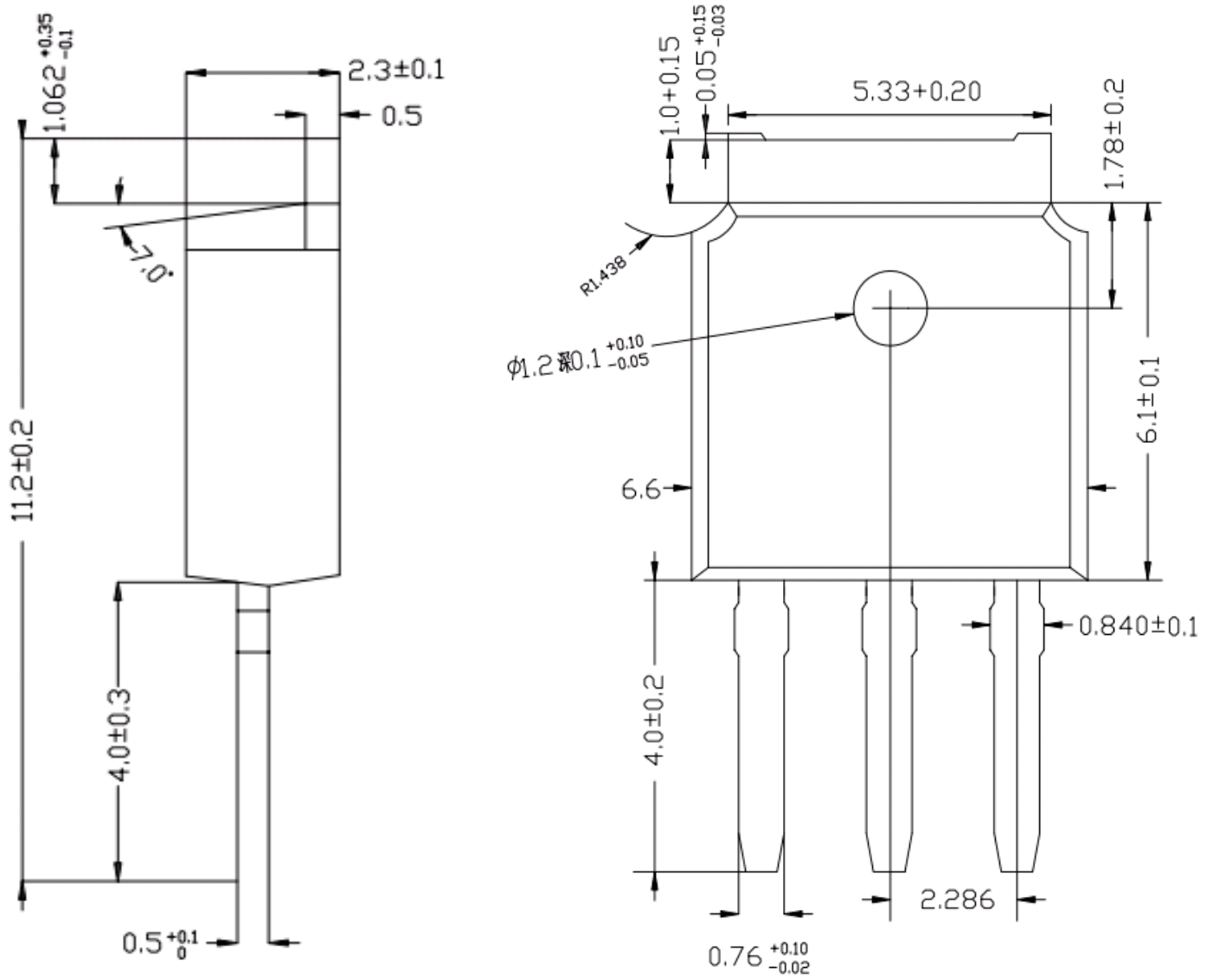


On-Resistance Variation vs. Temperature



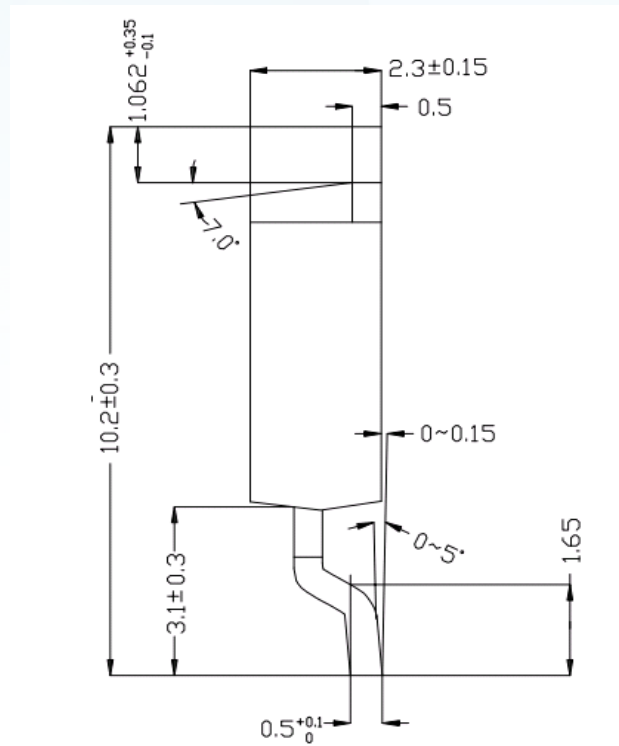
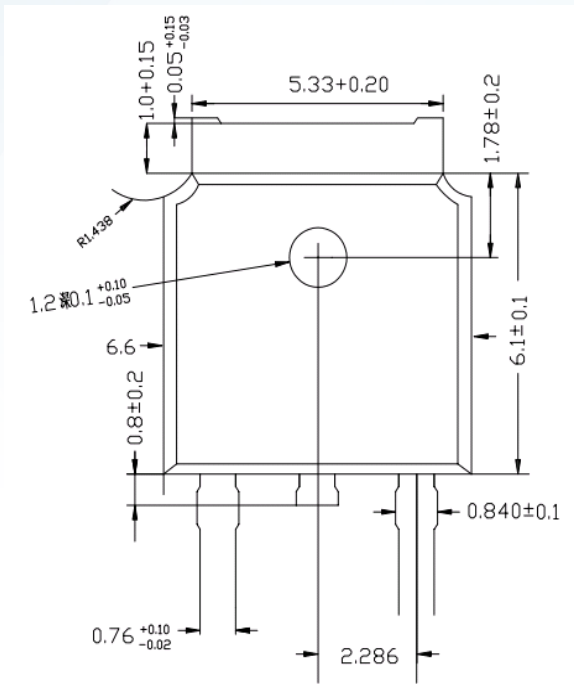
N-CHANNEL MOSFET

■ TO-251 PACKAGE OUTLINE DIMENSIONS



N-CHANNEL MOSFET

■ TO-252 PACKAGE OUTLINE DIMENSIONS



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