

■ PRODUCT CHARACTERISTICS

VDSS	650V
$R_{DS(on)typ}(@V_{GS}=10V)$	0.9Ω
Qg@type	44nC
ID	10A

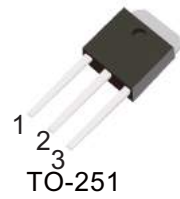
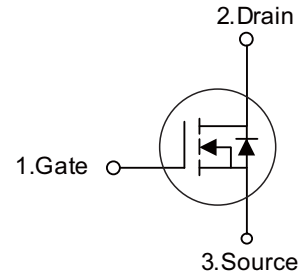
■ APPLICATIONS

- High frequency switching mode power supply
- Electronic ballast
- UPS

■ FEATURES

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

Symbol



■ ORDER INFORMATION

Order codes		Package	Packing
Halogen-Free	Halogen		
N/A	MOT10N65D	TO-252	2500 pieces /Reel
N/A	MOT10N65C	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}	10	A
Drain Current	Continuous	I_D	10
	Pulsed (Note 2)	I_{DM}	38
Avalanche Energy	Single Pulsed (Note 3)	E_{AS}	700
	Repetitive (Note 2)	E_{AR}	15.6
Peak Diode Recovery dv/dt (Note 4)	dv/dt	4.5	V/ns
Power Dissipation	TO-252/251	P_D	156
Junction Temperature	T_J	+150	°C
Operating Temperature	T_{OPR}	-55 ~ +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. $L = 14.2\text{mH}$, $I_{AS} = 10\text{A}$, $V_{DD} = 50\text{V}$, $R_G = 25\ \Omega$ Starting $T_J = 25^\circ\text{C}$
4. $I_{SD} \leq 9.5\text{A}$, $di/dt \leq 200\text{A}/\mu\text{s}$, $V_{DD} \leq BV_{DSS}$, Starting $T_J = 25^\circ\text{C}$

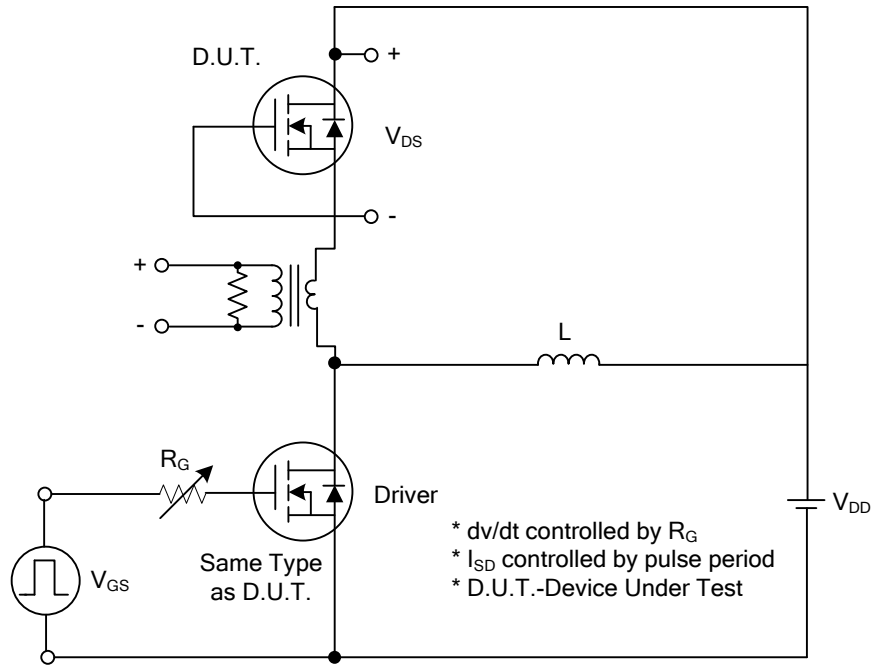
■ ELECTRICAL CHARACTERISTICS ($T_c = 25^\circ\text{C}$, unless otherwise specified)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
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	-	0.7	-	$V/^\circ\text{C}$
Dynamic 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	$R_{DS(ON)}$	$V_{GS} = 10V, I_D = 5.0A$	-	0.9	0.96	Ω
Dynamic characteristics						
Input Capacitance	C_{ISS}	$V_{DS}=25V, V_{GS}=0V, f=1.0\text{ MHz}$	-	1570	-	pF
Output Capacitance	C_{OSS}		-	166	-	pF
Reverse Transfer Capacitance	C_{RSS}		-	18	-	pF
Switching characteristics						
Turn-On Delay Time	$t_{D(ON)}$	$V_{DD}=325V, I_D = 10A, R_G = 25\Omega$ (Note 1, 2)	-	23	-	ns
Turn-On Rise Time	t_R		-	69	-	ns
Turn-Off Delay Time	$t_{D(OFF)}$		-	144	-	ns
Turn-Off Fall Time	t_F		-	77	-	ns
Total Gate Charge	Q_G	$V_{DS}=520V, I_D=10A, V_{GS}=10V$ (Note 1, 2)	-	44	-	nC
Gate-Source Charge	Q_{GS}		-	6.7	-	nC
Gate-Drain Charge	Q_{GD}		-	18.5	-	nC
Drain-source diode characteristics maximum ratings						
Drain-Source Diode Forward Voltage	V_{SD}	$V_{GS} = 0V, I_S = 10A$	-	-	1.4	V
Maximum Continuous Drain-Source Diode Forward Current	I_S		-	-	10	A
Maximum Pulsed Drain-Source Diode Forward Current	I_{SM}		-	-	38	A
Reverse Recovery Time	t_{rr}	$V_{GS} = 0V, I_S = 10A,$ $di_F / dt = 100\text{ A}/\mu\text{s}$ (Note 1)	-	420	-	ns
Reverse Recovery Charge	Q_{RR}		-	4.2	-	μC

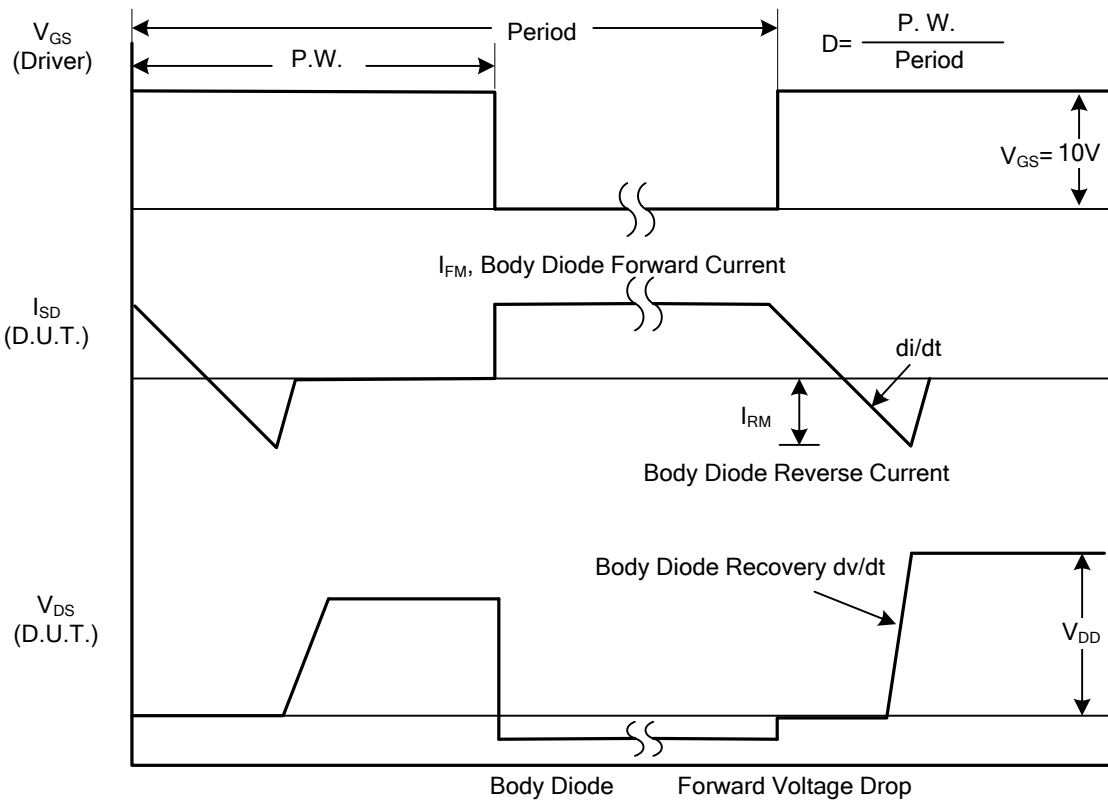
 Notes: 1. Pulse Test : Pulse width $\leq 300\mu\text{s}$, Duty cycle $\leq 2\%$

2. Essentially independent of operating temperature

TYTEST CIRCUITS AND WAVEFORMS

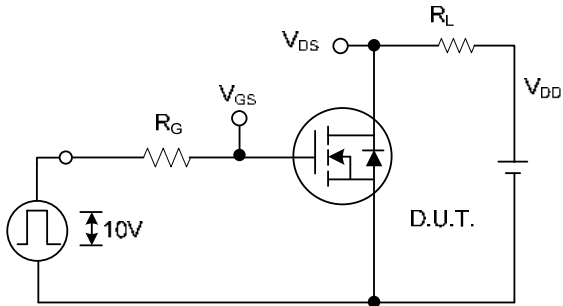


Peak Diode Recovery dv/dt Test Circuit

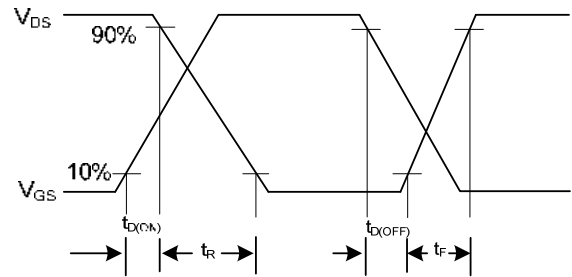


Peak Diode Recovery dv/dt Waveforms

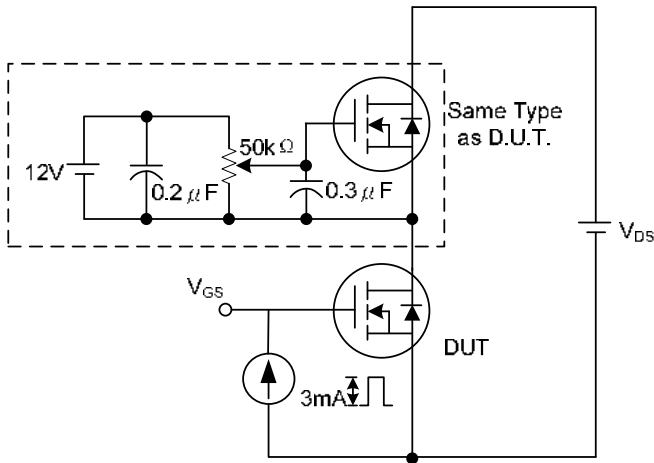
TYTEST CIRCUITS AND WAVEFORMS(Cont.)



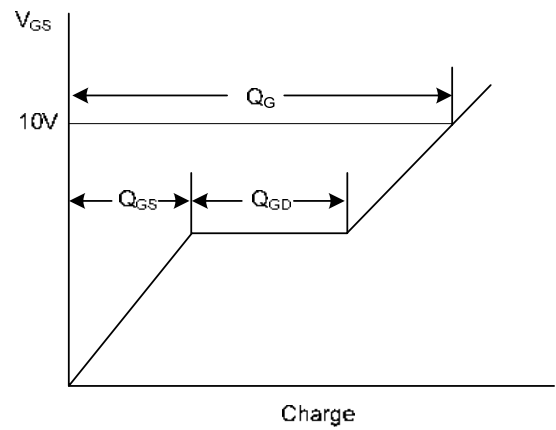
Switching Test Circuit



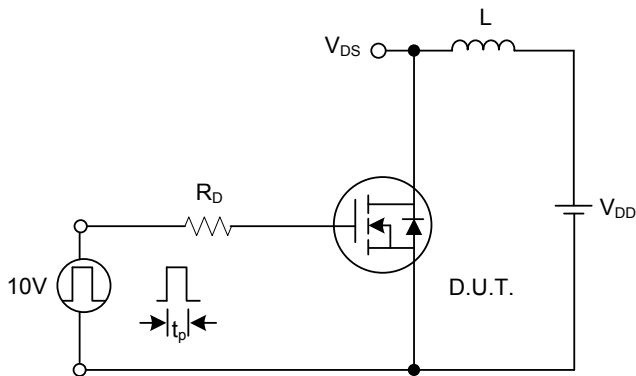
Switching Waveforms



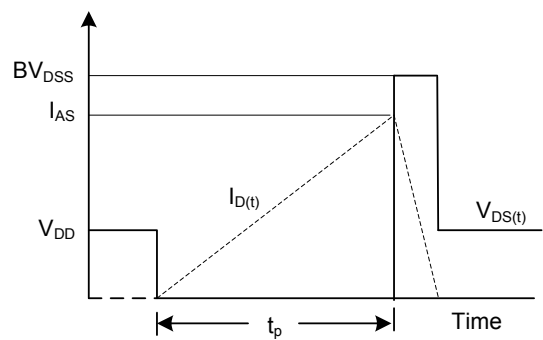
Gate Charge Test Circuit



Gate Charge Waveform



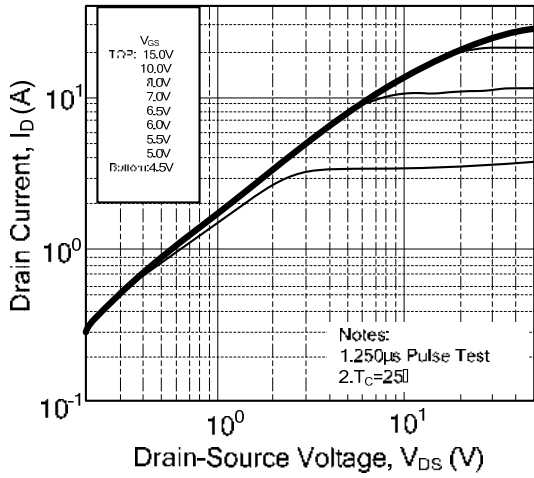
Unclamped Inductive Switching Test Circuit



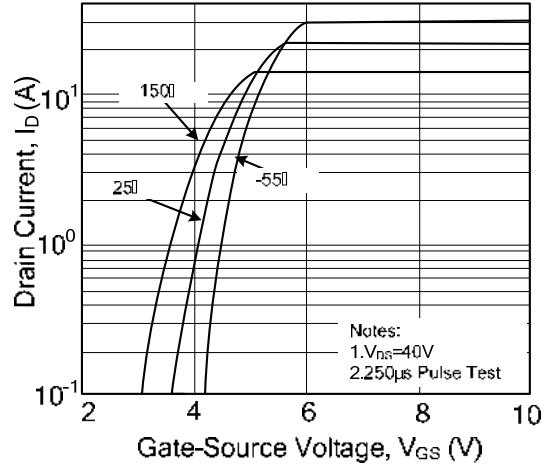
Unclamped Inductive Switching Waveforms

■ TYPICAL CHARACTERISTICS

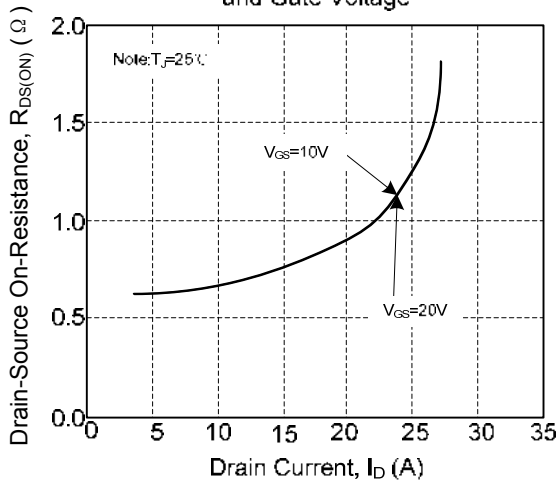
On-Region Characteristics



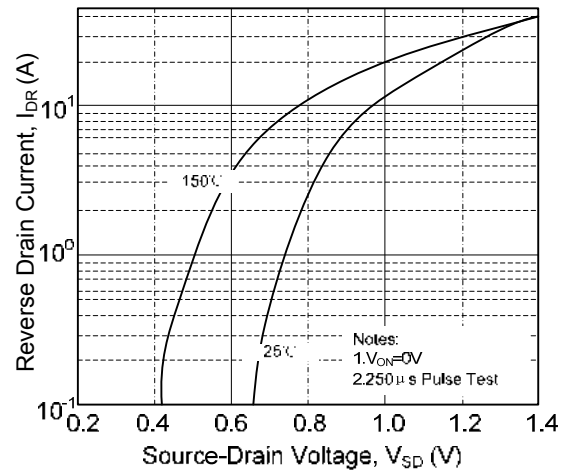
Transfer Characteristics



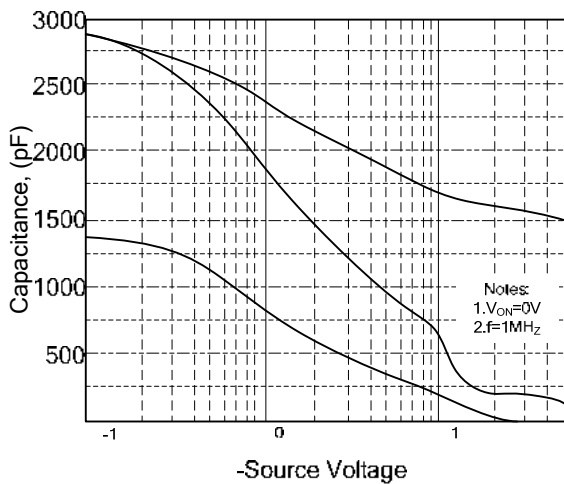
On-Resistance Variation vs. Drain Current and Gate Voltage



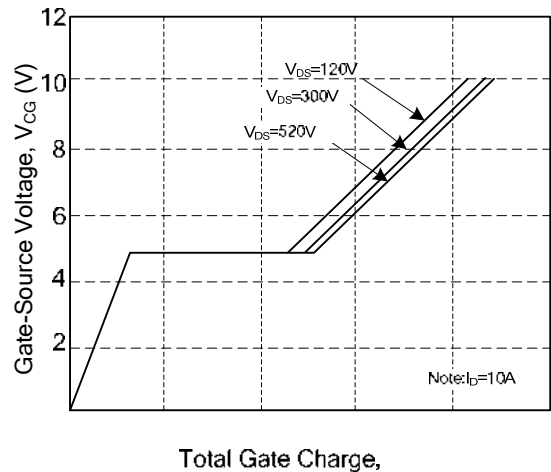
Body Diode Forward Voltage Variation with Source Current and Temperature



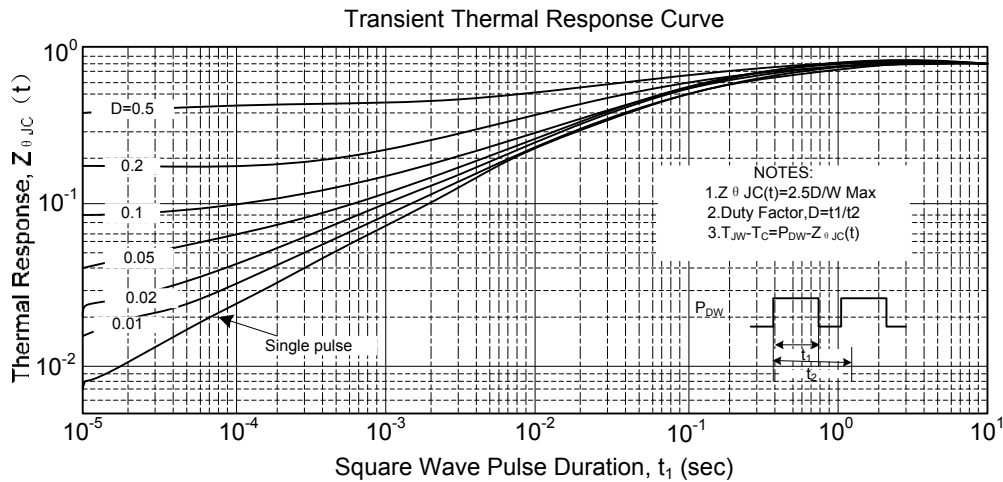
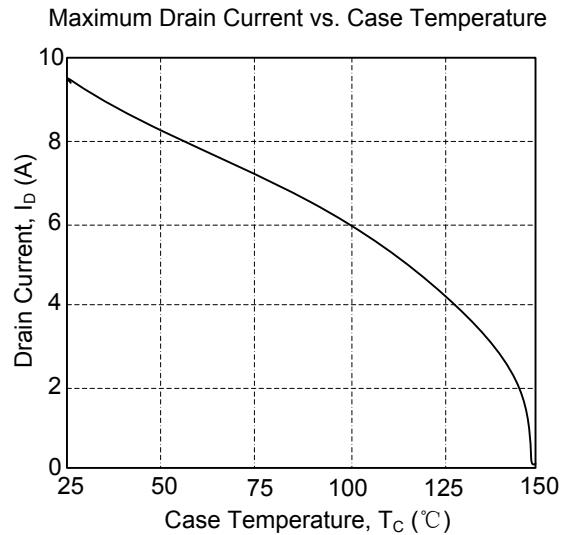
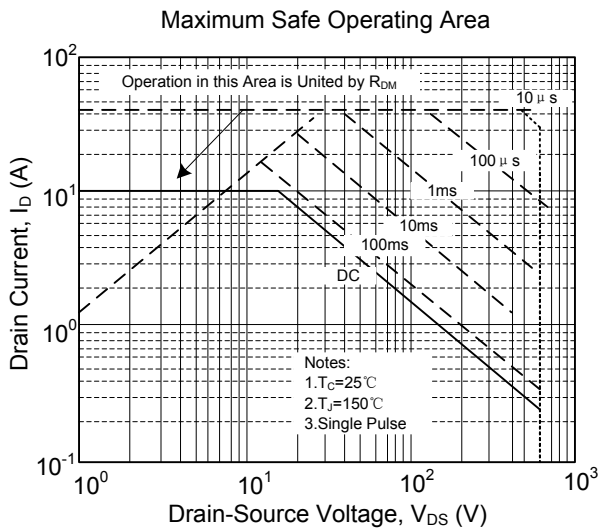
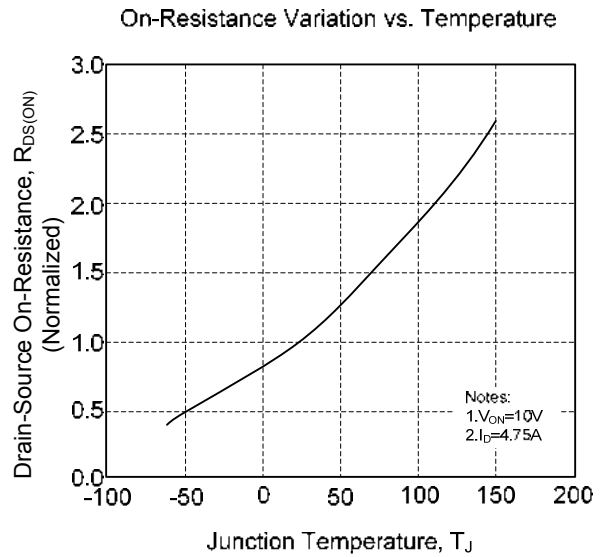
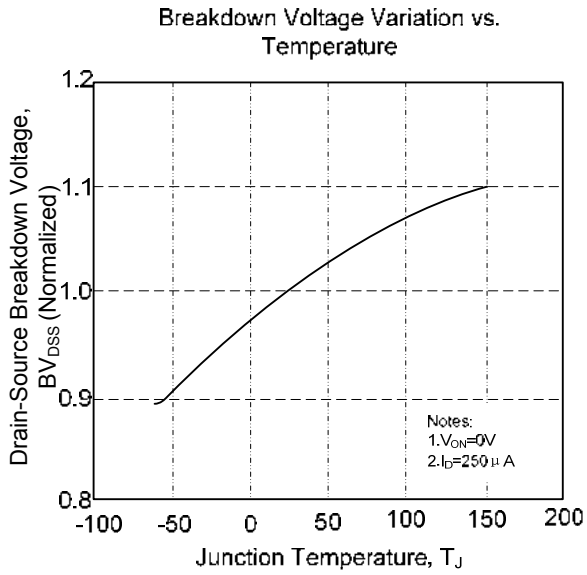
Capacitance Characteristics



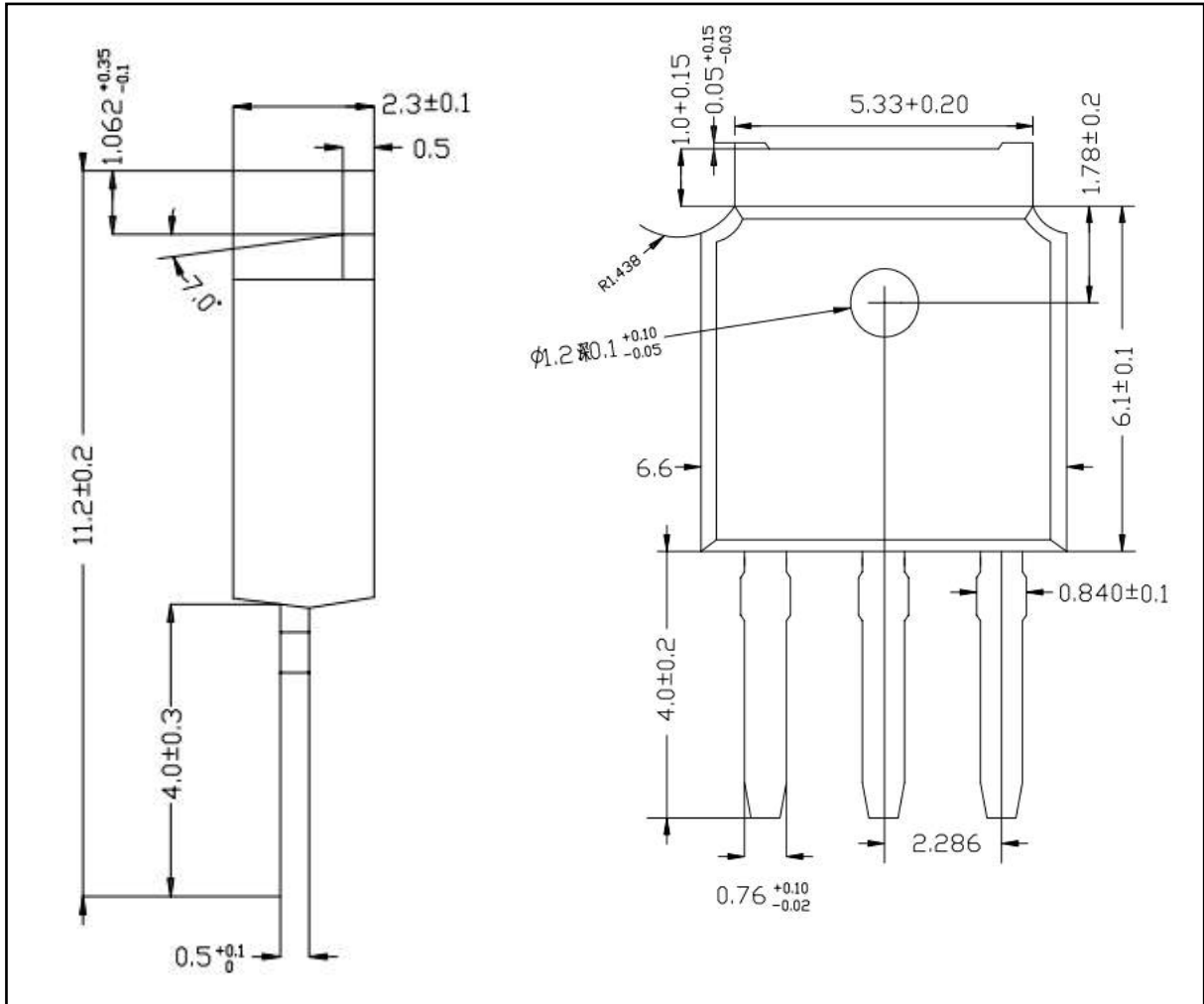
Gate Charge Characteristics



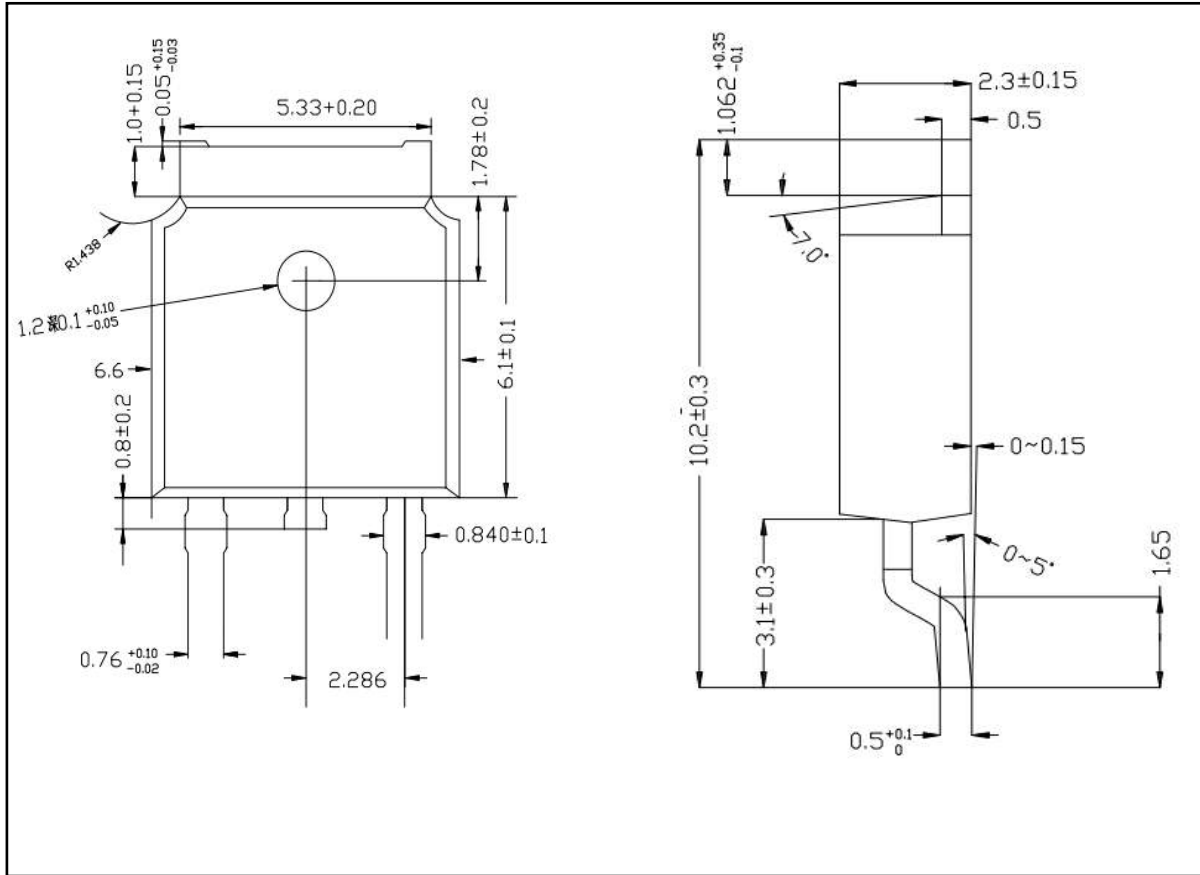
■ TYPICAL CHARACTERISTICS(Cont.)



■ TO-251 PACKAGE OUTLINE DIMENSIONS



■ TO-252 PACKAGE OUTLINE DIMENSIONS



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