

■ PRODUCT CHARACTERISTICS

VDSS	30V
$R_{DS(on)Typ}(@V_{GS}=10V)$	8mΩ
$R_{DS(on)Typ}(@V_{GS}=4.5V)$	10mΩ
ID	50A

■ APPLICATIONS

- * Switching applications

■ FEATURES

- * Low capacitance
- * Low gate charge
- * Fast switching capability
- * Avalanche energy specified

■ ORDER INFORMATION

Order codes		Package	Packing
Halogen-Free	Halogen		
N/A	MOT50N03D	TO-252	2500 pieces /Reel
N/A	MOT50N03C	TO-251	70 pieces/Tube

■ ABSOLUTE MAXIMUM RATINGS ($T_C = 25^\circ\text{C}$, unless otherwise specified)

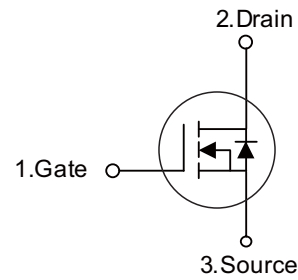
PARAMETER	SYMBOL	RATINGS	UNIT
Drain-Source Voltage	V_{DSS}	30	V
Gate-Source Voltage	V_{GSS}	±20	V
Continuous Drain Current	I_D	50	A
Pulsed Drain Current (Note 2)	I_{DM}	180	A
Single Pulsed Avalanche Energy (Note 3)	E_{AS}	45	mJ
Power Dissipation	P_D	50	W
Junction Temperature	T_J	+150	°C
Storage Temperature	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. $L = 0.1\text{mH}$, $I_{AS} = 30\text{A}$, $V_{DD} = 50\text{V}$, $R_G = 25\ \Omega$, Starting $T_J = 25^\circ\text{C}$.

Symbol



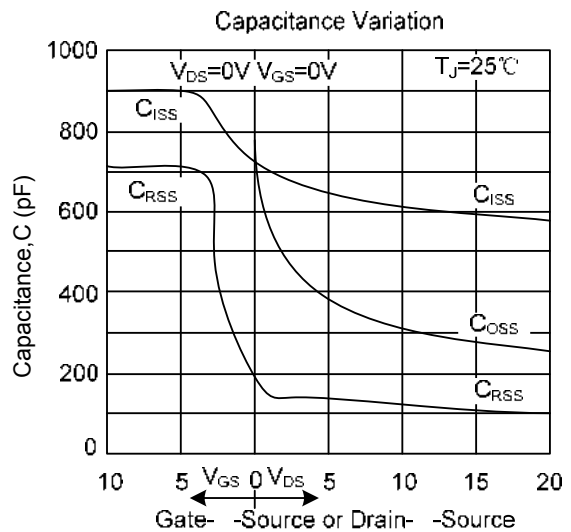
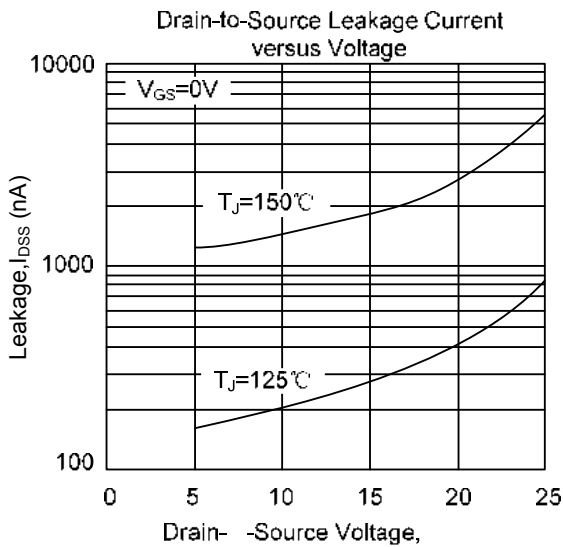
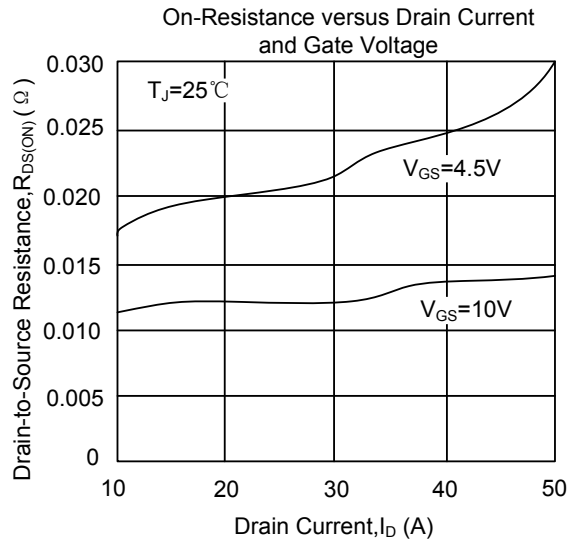
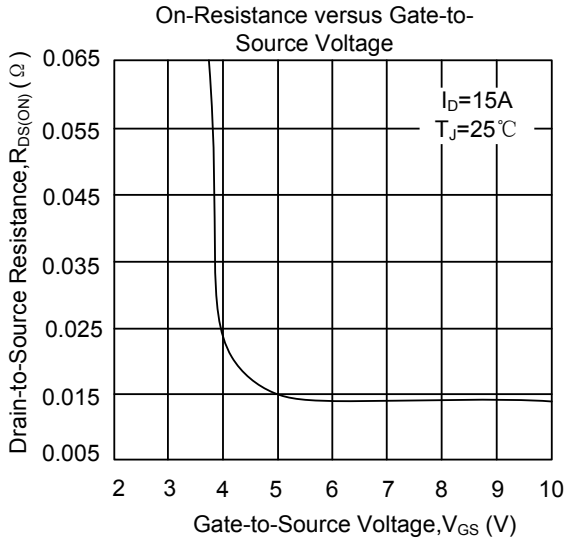
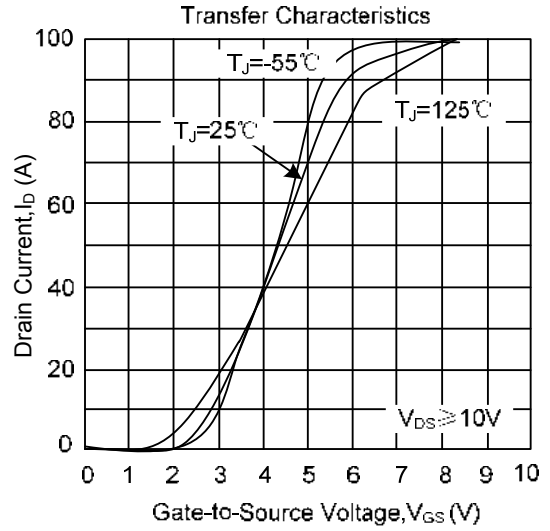
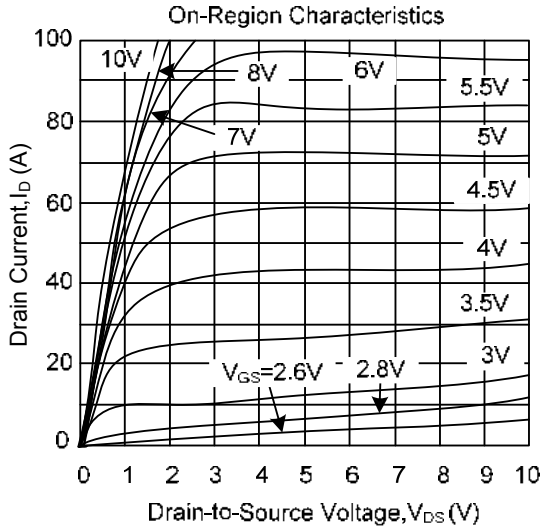
■ ELECTRICAL CHARACTERISTICS (T_c=25°C, unless otherwise noted)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Off characteristics						
Drain-Source Breakdown Voltage	BV _{DSS}	V _{GS} =0V, I _D =250 μA	30	-	-	V
Drain-Source Leakage Current	I _{DSS}	V _{DS} =20V, V _{GS} =0V	-	-	1.5	μA
Gate-Source Leakage Current	I _{GSS}	V _{DS} =0V, V _{GS} =±20V	-	-	±100	nA
On characteristics						
Gate-Threshold Voltage	V _{GS(TH)}	V _{DS} =V _{GS} , I _D =250 μA	1.0	1.7	2.0	V
Drain-Source On-State Resistance	R _{DS(ON)}	V _{GS} =10 V, I _D =15 A	-	8	10	mΩ
		V _{GS} =4.5V, I _D =10 A	-	10	13	mΩ
Dynamic characteristics						
Input Capacitance	C _{ISS}	V _{DS} =12V, V _{GS} =0V, f=1MHz	-	610	-	pF
Output Capacitance	C _{OSS}		-	300	-	pF
Reverse Transfer Capacitance	C _{RSS}		-	125	-	pF
Switching characteristics						
Turn-ON Delay Time	t _{D(ON)}	V _{GS} =4.5 V, V _{DS} =15 V, I _D =30 A, R _G =3.0Ω	-	8.2	-	ns
Turn-ON Rise Time	t _R		-	9.6	-	ns
Turn-OFF Delay Time	t _{D(OFF)}		-	11.2	-	ns
Turn-OFF Fall-Time	t _F		-	6.8	-	ns
Turn-ON Delay Time	t _{D(ON)}	V _{GS} =11.5 V, V _{DS} =15 V, I _D =30 A, R _G =3.0Ω	-	5.0	-	ns
Turn-ON Rise Time	t _R		-	84	-	ns
Turn-OFF Delay Time	t _{D(OFF)}		-	15	-	ns
Turn-OFF Fall-Time	t _F		-	4.0	-	ns
Total Gate Charge	Q _G	V _{DS} =15V, V _{GS} =4.5V, I _D =30 A	-	6.0	-	nC
Gate-to-Source Charge	Q _{GS}		-	1.9	-	nC
Gate-to-Drain Charge	Q _{GD}		-	3.7	-	nC
Total Gate Charge	Q _G	V _{DS} =15V, V _{GS} =11.5V, I _D =30 A	-	15	-	nC
Gate-to-Source Charge	Q _{GS}		-	1.9	-	nC
Gate-to-Drain Charge	Q _{GD}		-	3.9	-	nC
Source-drain diode ratings and characteristics						
Drain-Source Diode Forward Voltage	V _{SD}	I _S =30 A, V _{GS} =0V	-	0.85	1.1	V
Maximum Continuous Drain-Source Diode Forward Current	I _S		-	-	50	A
Reverse Recovery Time	t _{rr}	I _S =30 A, V _{GS} =0 V,	-	24	-	ns
Reverse Recovery Charge	Q _{RR}	dI/dt = 100 A/μs	-	14	-	nC

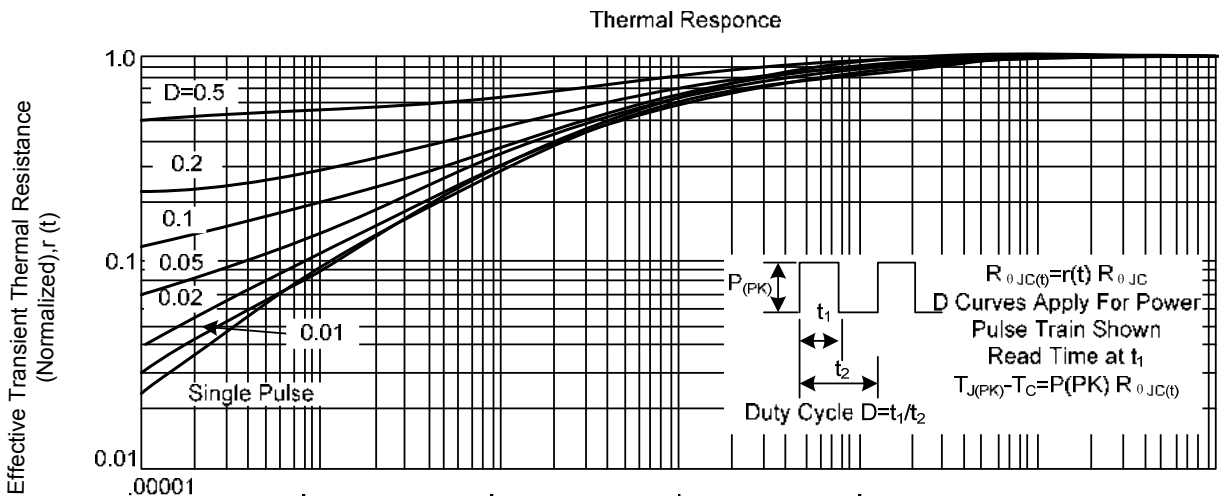
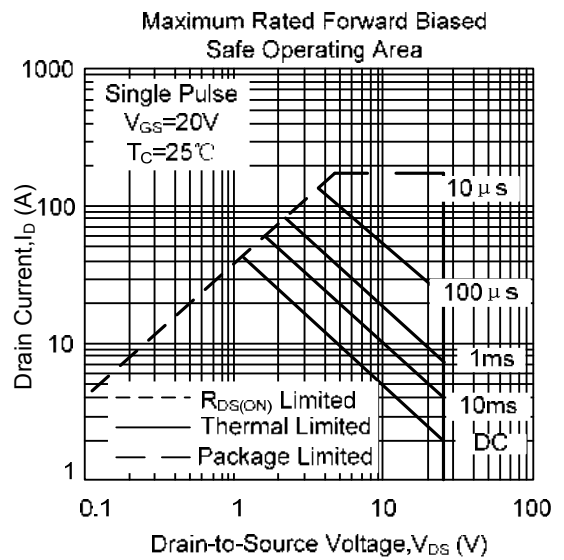
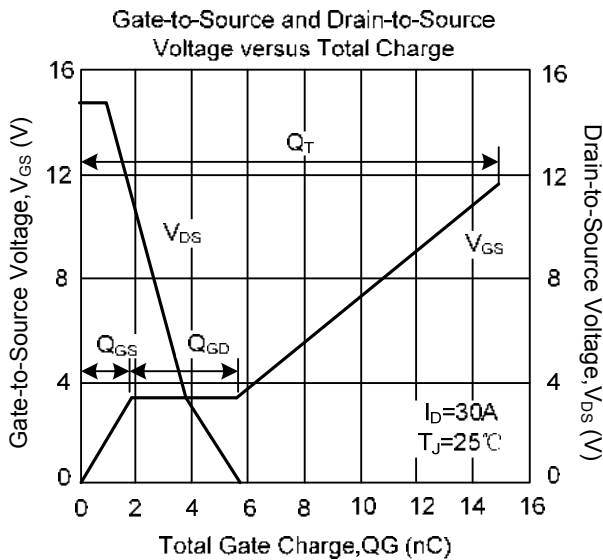
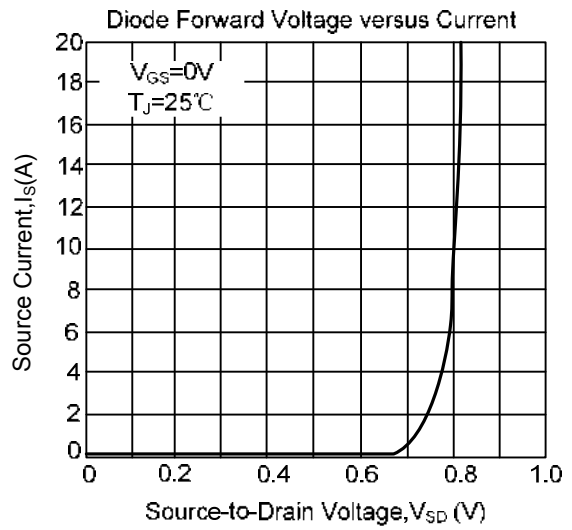
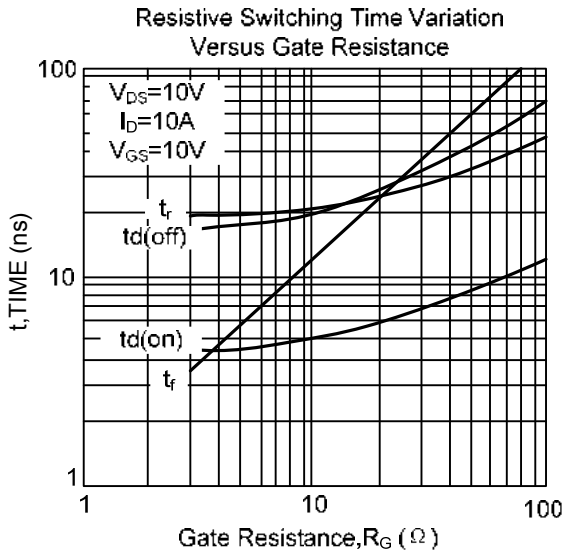
 Notes: 1. Pulse width limited by T_{J(MAX)}

2. Pulse Test: Pulse Width≤300μs, Duty Cycles≤2%

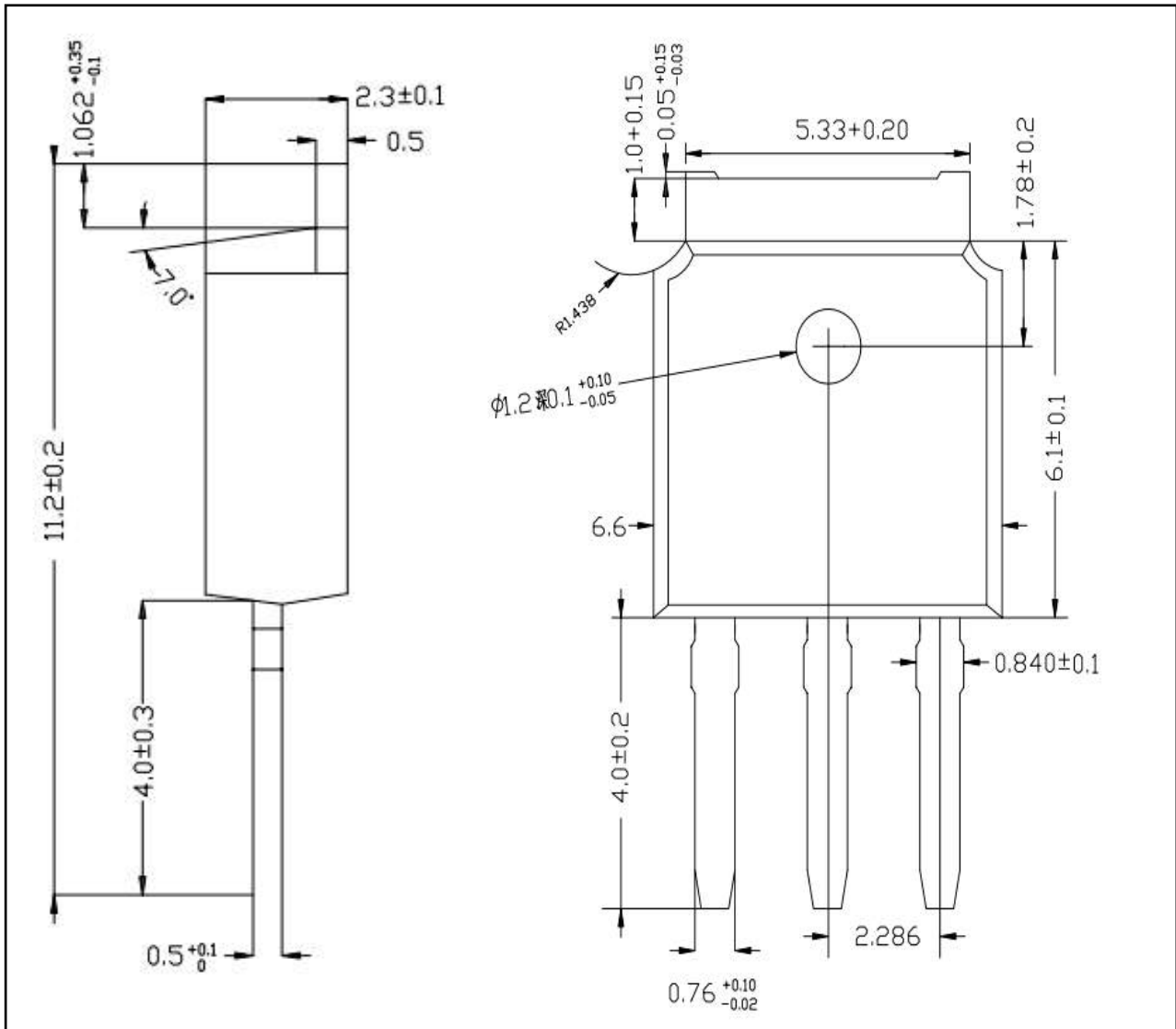
■ TYPICAL CHARACTERISTICS



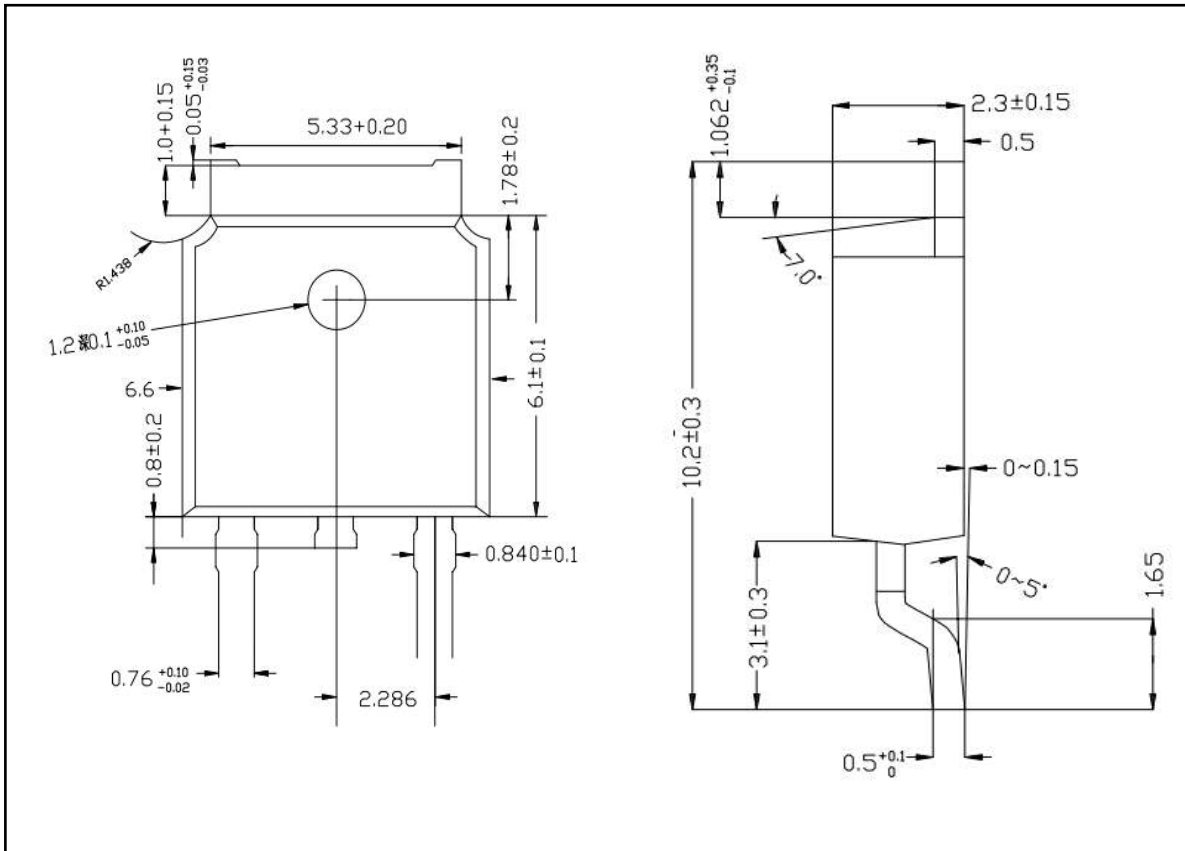
■ TYPICAL CHARACTERISTICS(Cont.)



■ TO-251 PACKAGE OUTLINE DIMENSIONS



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