

■ PRODUCT CHARACTERISTICS

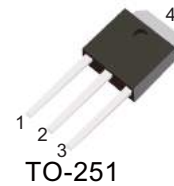
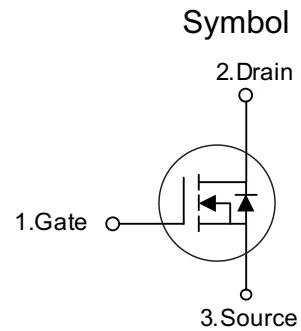
VDSS	20V
$R_{DS(on)max}(V_{GS}=2.5V)$	14mΩ
$R_{DS(on)max}(V_{GS}=4.5V)$	9.5mΩ
ID	40A

■ 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	MOT40N02D	TO-252	2500 pieces /Reel
N/A	MOT40N02C	TO-251	70 pieces/Tube

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

PARAMETER		SYMBOL	RATINGS	UNIT
Drain-Source Voltage		V_{DSS}	20	V
Gate-Source Voltage		V_{GSS}	±8	V
Drain Current	Continuous	I_D	40	A
	Pulsed	I_{DM}	80	A
Single Pulsed Avalanche Energy		E_{AS}		mJ
Power Dissipation		P_D	60	W
Junction Temperature		T_J	+150	°C
Storage Temperature Range		T_{STG}	-55 ~ +150	°C

■ THERMAL DATA

PARAMETER	SYMBOL	RATINGS	UNIT
Junction to Ambient	θ_{JA}	62.5	°C/W
Junction to Case	θ_{JC}	2.03	°C/W

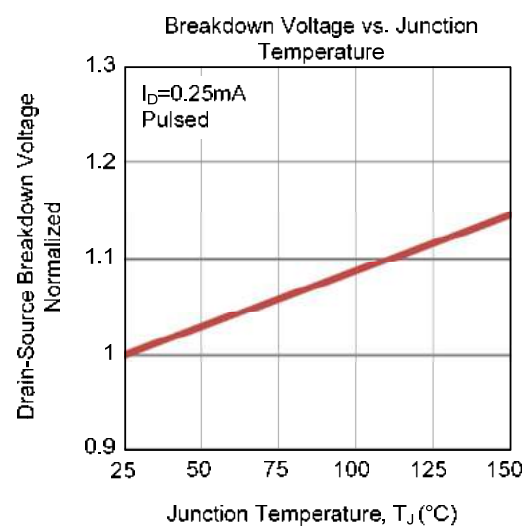
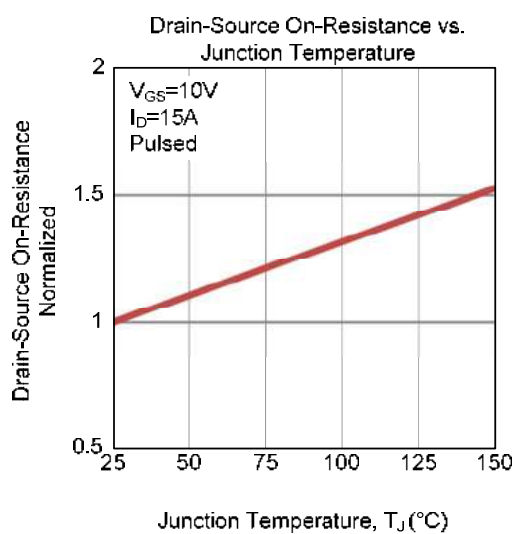
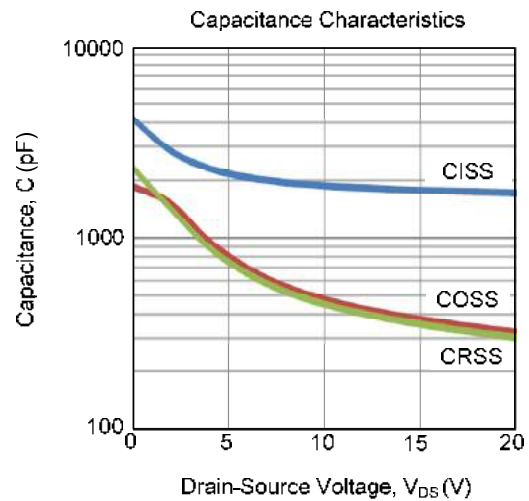
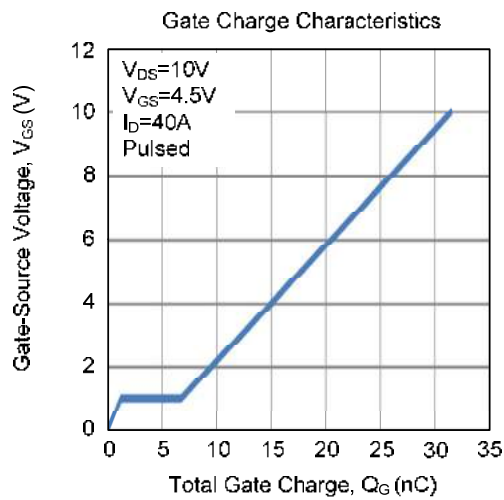
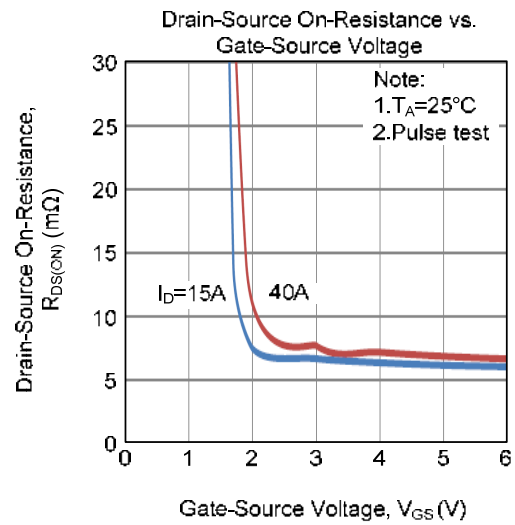
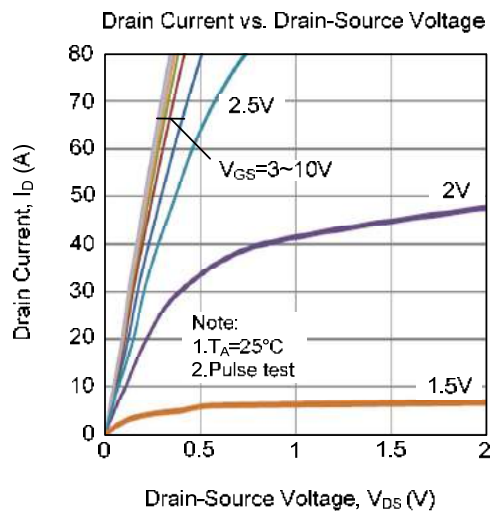
■ ELECTRICAL CHARACTERISTICS ($T_C=25^\circ\text{C}$, unless otherwise specified)

PARAMETER		SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Off characteristics							
Drain-Source Breakdown Voltage		BV _{DSS}	I _D =250μA, V _{GS} =0V	20	-	-	V
Drain-Source Leakage Current		I _{DSS}	V _{DS} =20V, V _{GS} =0V	-	-	1	μA
Gate-Source Leakage Current	Forward	I _{GSS}	V _{GS} =+8V, V _{DS} =0V	-	-	+100	nA
	Reverse		V _{GS} =-8V, V _{DS} =0V	-	-	-100	nA
On characteristics							
Gate Threshold Voltage		V _{GS(TH)}	V _{DS} =V _{GS} , I _D =250μA	0.4	-	1.0	V
Static Drain-Source On-State Resistance		R _{DS(ON)}	V _{GS} =4.5V, I _D =15A	-	8.3	9.5	mΩ
			V _{GS} =2.5V, I _D =6.0A	-	12	14	mΩ
Dynamic characteristics							
Input Capacitance		C _{ISS}	V _{GS} =0V, V _{DS} =20V, f=1.0MHz	-	1720	-	pF
Output Capacitance		C _{OSS}		-	321	-	pF
Reverse Transfer Capacitance		C _{RSS}		-	303	-	pF
Switching characteristics							
Total Gate Charge		Q _G	V _{DS} =10V, V _{GS} =4.5V, I _D =40A, I _D =1mA (Note 1, 2)	-	32.5	-	nC
Gate to Source Charge		Q _{GS}		-	2.5	-	nC
Gate to Drain Charge		Q _{GD}		-	11	-	nC
Turn-ON Delay Time		t _{D(ON)}	V _{DS} =10V, V _{GS} =4.5V, I _D =40A, R _G =25Ω (Note 1, 2)	-	7.5	-	ns
Rise Time		t _R		-	19.5	-	ns
Turn-OFF Delay Time		t _{D(OFF)}		-	57	-	ns
Fall-Time		t _F		-	24	-	ns
Source-drain diode ratings and characteristics							
Maximum Body-Diode Continuous Current		I _S		-	-	40	A
Maximum Body-Diode Pulsed Current		I _{SM}		-	-	80	A
Drain-Source Diode Forward Voltage		V _{SD}	I _S =1A, V _{GS} =0V	-	-	1.2	V

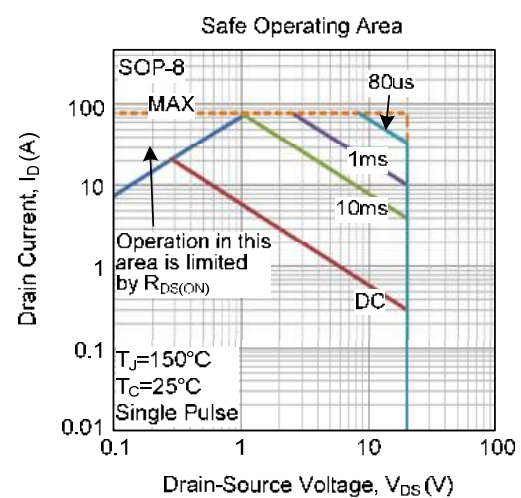
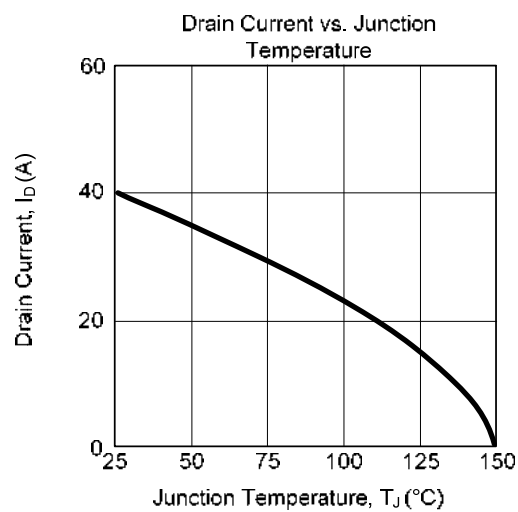
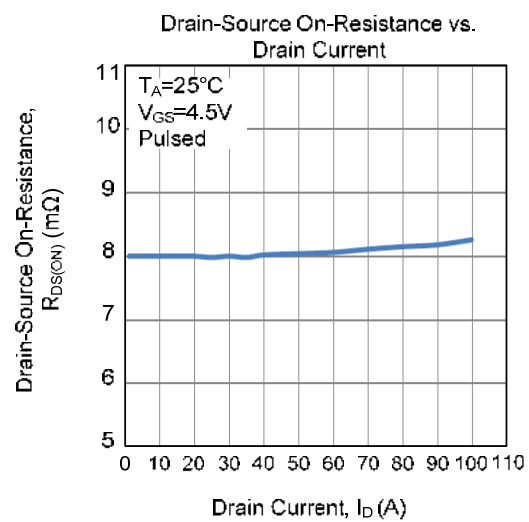
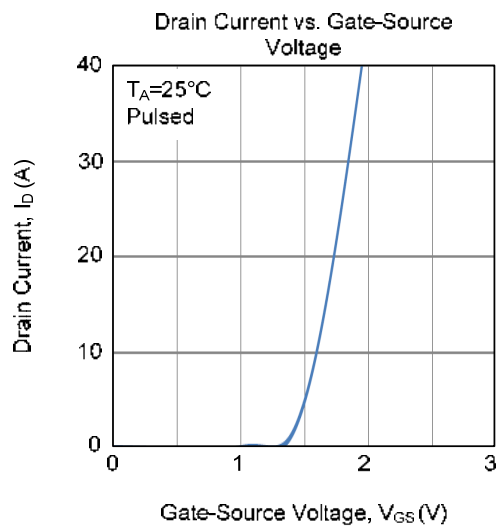
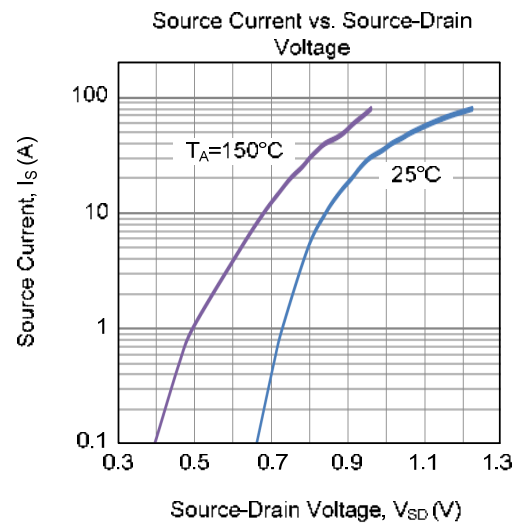
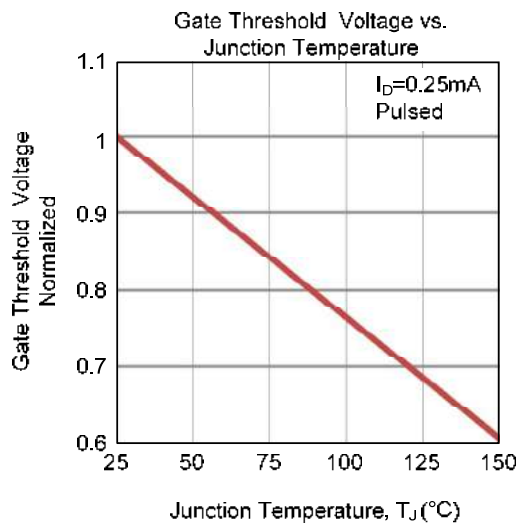
Notes: 1. Pulse Test: Pulse width $\leq 300\mu\text{s}$, Duty cycle $\leq 2\%$.

2. Essentially independent of operating temperature.

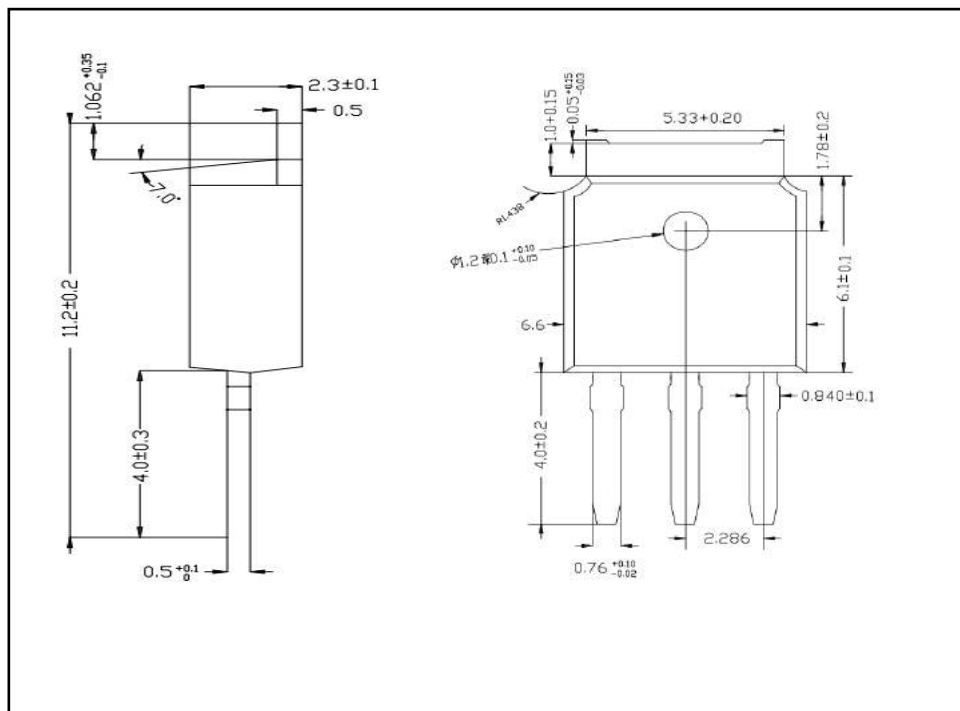
■ TYPICAL CHARACTERISTICS



■ TYPICAL CHARACTERISTICS(Cont.)



■ TO-251 PACKAGE OUTLINE DIMENSIONS



Technical drawing of a mechanical part, showing front and side views with dimensions.

Front View Dimensions:

- Top left corner radius: $R4.38$
- Top left vertical dimension: 1.0 ± 0.15
- Top left horizontal dimension: $0.05 \begin{smallmatrix} +0.15 \\ -0.03 \end{smallmatrix}$
- Top center horizontal dimension: 5.33 ± 0.20
- Top right vertical dimension: 1.78 ± 0.2
- Right side vertical dimension: 6.1 ± 0.1
- Bottom right horizontal dimension: 0.840 ± 0.1
- Bottom center horizontal dimension: 2.286
- Bottom left horizontal dimension: $0.76 \begin{smallmatrix} +0.10 \\ -0.02 \end{smallmatrix}$
- Left side vertical dimension: 6.6
- Left side horizontal dimension: $1.2 \begin{smallmatrix} +0.10 \\ -0.05 \end{smallmatrix}$

Side View Dimensions:

- Top left vertical dimension: $1.062 \begin{smallmatrix} +0.35 \\ -0.1 \end{smallmatrix}$
- Top right horizontal dimension: 2.3 ± 0.15
- Top right vertical dimension: 0.5
- Left side vertical dimension: 10.2 ± 0.3
- Left side horizontal dimension: 3.1 ± 0.3
- Bottom left horizontal dimension: $0.5 \begin{smallmatrix} +0.1 \\ 0 \end{smallmatrix}$
- Bottom right horizontal dimension: 1.65
- Internal horizontal dimension: $0 \sim 0.15$
- Internal angle: $0 \sim 5^\circ$
- Internal angle: 7.0°