

PRODUCT CHARACTERISTICS

V_{DS}	20V
$R_{DS(ON)}$ Typ(@ $V_{GS}=4.5V$)	5.6m Ω
$R_{DS(ON)}$ Typ(@ $V_{GS}=2.5V$)	6.8m Ω
ID	25A

APPLICATIONS

- Portable Equipment and Battery Powered systems.
- Power Management in Notebook Computer

FEATURES

- Lower $R_{DS(ON)}$ to Minimize Conduction Losses
- Reliable and Rugged
- ROHS Compliant & Halogen-Free
- 100% UIS and Rg Tested

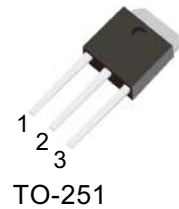
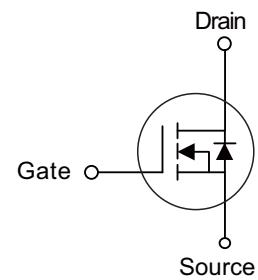
ORDER INFORMATION

Order codes		Package	Packing
Halogen-free	Halogen		
N/A	MOT2176C	TO-251	70 pieces/Tube
N/A	MOT2176D	TO-252	2500 pieces/Reel

ABSOLUTE MAXIMUM RATINGS ($T_J=25^{\circ}C$ Unless Otherwise Noted)

PARAMETER		SYMBOL	RATINGS	UNIT
Drain-Source Voltage		V_{DS}	20	V
Gate-Source Voltage		V_{GS}	± 12	V
Drain Current	$T_C=25^{\circ}C$	I_D	25	A
	$T_C=100^{\circ}C$	I_D	16	A
Plused Drain Current		I_{DM}	100	A
Avalanche Energy		E_{AS}	49	mJ
Power Dissipation		P_D	13	W
Junction Temperature		T_J	+150	$^{\circ}C$
Storage Temperature Range		T_{STG}	-55 ~ +150	$^{\circ}C$

Symbol



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

Parameter	Symbol	Condition	Min	Typ	Max	Unit
Off characteristics						
Drain-Source Breakdown Voltage	BV_{DSS}	$V_{GS}=0V, I_D=250\mu A$	20	-	-	V
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS}=20V, V_{GS}=0V$	-	-	1	μA
Gate-Body Leakage Current	I_{GSS}	$V_{GS}=\pm 12V, V_{DS}=0V$	-	-	± 100	nA
On characteristics						
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS}=V_{GS}, I_D=250\mu A$	0.4		1.0	V
Drain-Source On-State Resistance	$R_{DS(ON)}$	$V_{GS}=4.5V, I_D=15A$	-	5.6	7	m Ω
		$V_{GS}=2.5V, I_D=15A$	-	6.8	7.8	m Ω
Forward Transconductance	g_{FS}	$V_{DS}=5V, I_D=25A$	10	-	-	S
Dynamic characteristics						
Input Capacitance	C_{iss}	$V_{DS}=12V, V_{GS}=0V,$ $F=1.0MHz$	-	1200	-	PF
Output Capacitance	C_{oss}		-	170	-	PF
Reverse Transfer Capacitance	C_{rss}		-	150	-	PF
Switching characteristics						
Turn-on Delay Time	$t_{d(on)}$	$V_{DD}=10V, I_D=5A$ $V_{GS}=4.5V, R_G=3\Omega$	-	13	-	nS
Turn-on Rise Time	t_r		-	45	-	nS
Turn-Off Delay Time	$t_{d(off)}$		-	49	-	nS
Turn-Off Fall Time	t_f		-	59	-	nS
Total Gate Charge	Q_g	$V_{DS}=10V, I_D=5A,$ $V_{GS}=4.5V$	-	19	-	nC
Gate-Source Charge	Q_{gs}		-	3	-	nC
Gate-Drain Charge	Q_{gd}		-	5.5	-	nC
Drain-source diode characteristics						
Diode Forward Voltage	V_{SD}	$V_{GS}=0V, I_S=25A$	-	-	1.2	V
Diode Forward Current	I_S		-	-	25	A
Reverse Recovery Time	t_{rr}	$T_J=25^{\circ}C, I_F=5A$ $di/dt=100A/\mu s$	-	25	-	nS
Reverse Recovery Charge	Q_{rr}		-	6	-	nC

■ TYPICAL CHARACTERISTICS

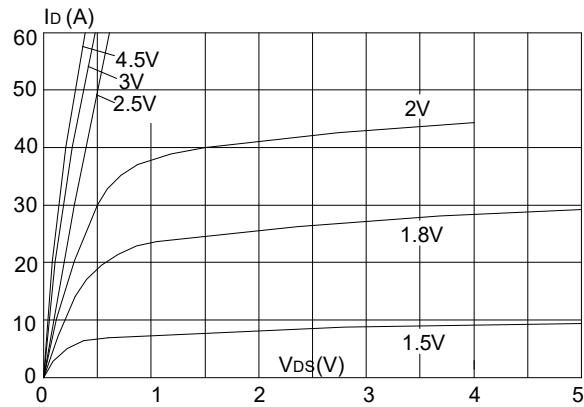


Figure 3: Output Characteristics

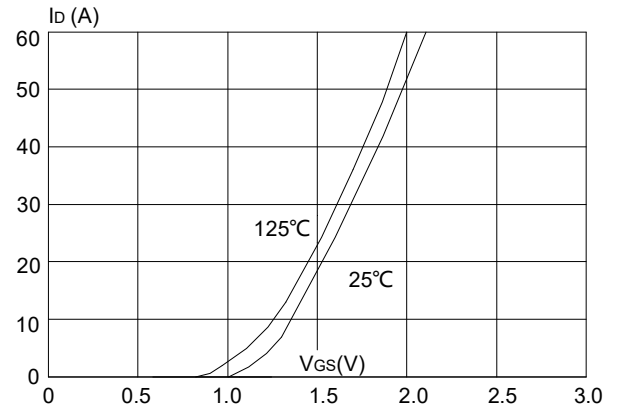


Figure 4: Typical Transfer Characteristics

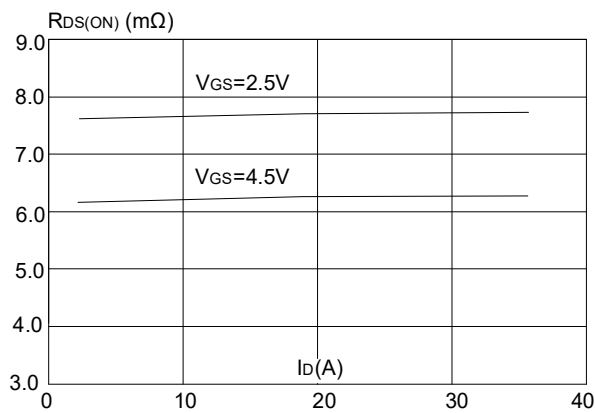


Figure 3: On-resistance vs. Drain Current

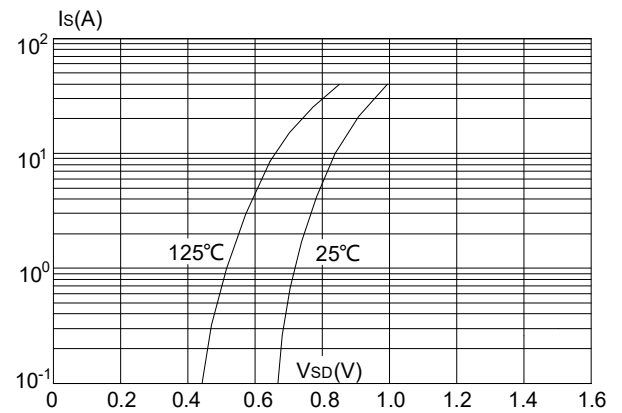


Figure 4: Body Diode Characteristics

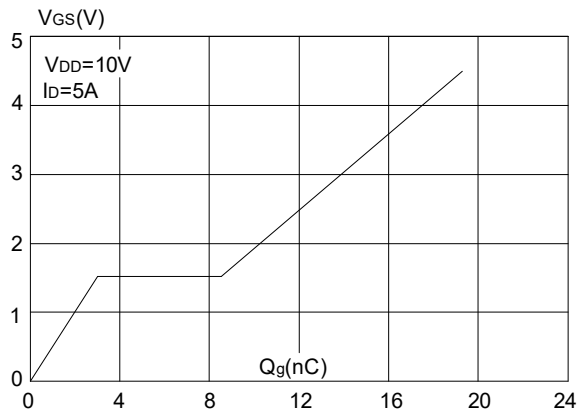


Figure 5: Gate Charge Characteristics

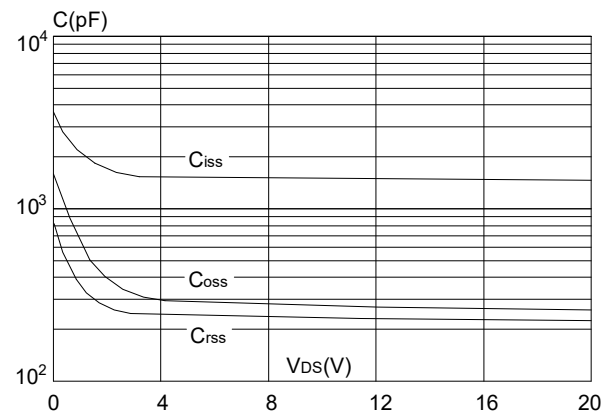


Figure 6: Capacitance Characteristics

■ TYPICAL CHARACTERISTICS(Cont.)

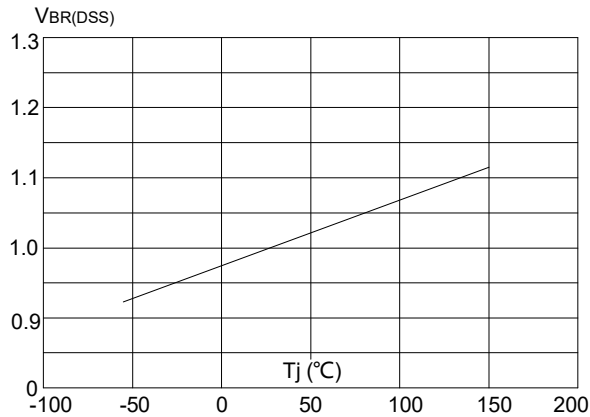


Figure 7: Normalized Breakdown Voltage vs. Junction Temperature

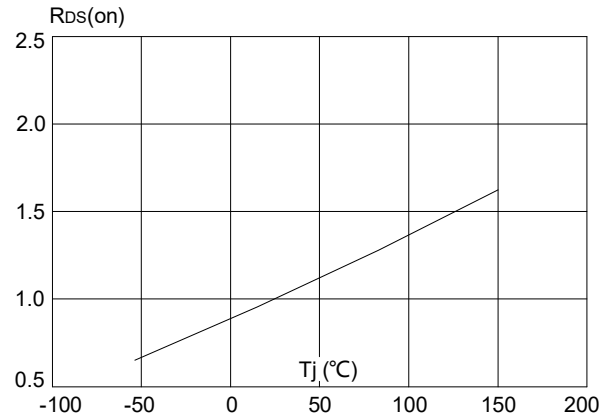


Figure 8: Normalized on Resistance vs. Junction Temperature

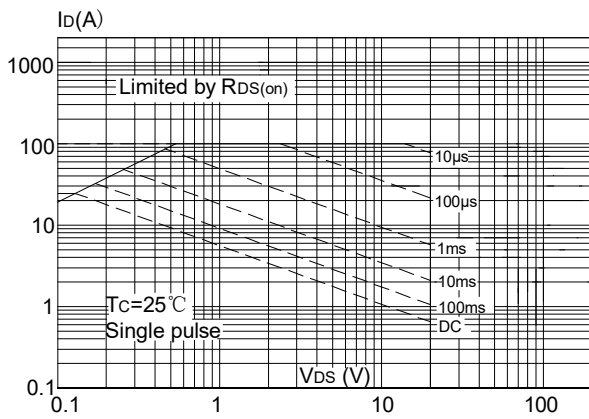


Figure 7: Maximum Safe Operating Area

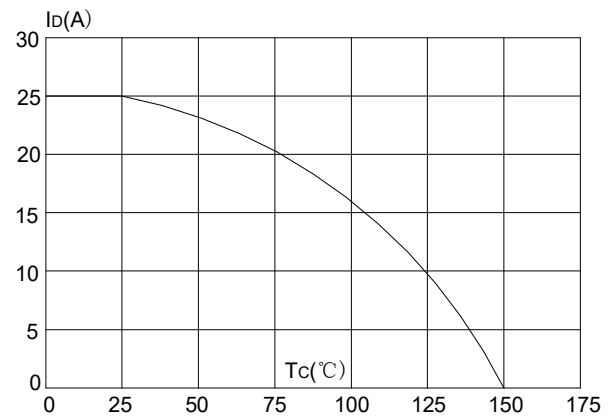


Figure 8: Maximum Continuous Drain Current vs. Case Temperature

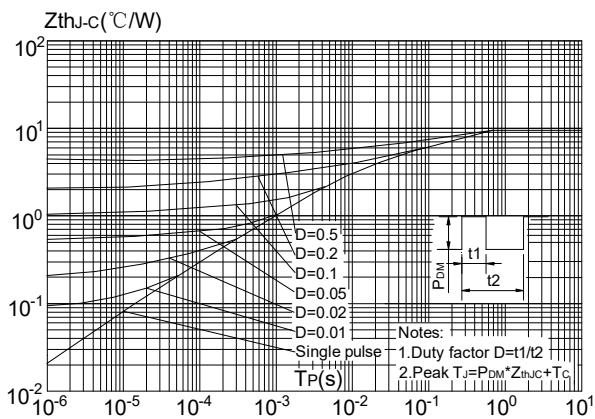


Figure 7: Maximum Effective Transient Thermal Impedance, Junction-to-Case

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

Front View (Left):

- Overall width: 5.33 ± 0.20
- Overall height: 6.1 ± 0.1
- Top left corner radius: $R1.459$
- Top left corner dimensions: 1.0 ± 0.15 and 0.05 ± 0.03
- Bottom left corner dimensions: 0.8 ± 0.2 and $0.76 \pm 0.10 / -0.02$
- Bottom center dimension: 2.286
- Bottom right corner dimensions: 1.78 ± 0.2 and 0.840 ± 0.1
- Central circular feature with diameter 1.2 ± 0.1 (tolerance $+0.10 / -0.05$)

Side View (Right):

- Overall height: 10.2 ± 0.3
- Top right corner dimensions: 2.3 ± 0.15 and 0.5
- Top left corner dimension: $1.062 \pm 0.35 / -0.1$
- Internal angle: 7.0°
- Bottom left corner dimension: 3.1 ± 0.3
- Bottom right corner dimensions: $0.5 \pm 0.1 / 0$ and 1.65
- Internal features with dimensions $0 \sim 0.15$ and $0 \sim 5$

■ TO-251 PACKAGE OUTLINE DIMENSIONS

