

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
I_D	60A

APPLICATIONS

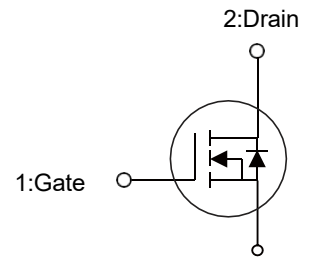
- * Electronic lamp ballasts based on half bridge
- * Load Switching, Quick/Wireless Charge.
- * Motor Driving

FEATURE

- * Low Gate Charge
- * Pb-Free Lead Plating



Symbol



3:Source



TO-252

ORDER INFORMATION

Order Codes		Package	Packing
Halogen-Free	Halogen		
N/A	MOT2176D	TO-252	2500 pieces/Reel

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

Parameter	Symbol	Ratings	Unit
Drain-Source Voltage	V_{DS}	20	V
Gate-Source Voltage	V_{GS}	± 12	V
Drain Current Continuous($@V_{GS}=4.5V, T_A=25^{\circ}C$)	I_D	60	A
Drain Current Continuous($@V_{GS}=4.5V, T_A=100^{\circ}C$)	I_D	42	A
Drain Current Pulsed	I_{DM}	240	A
Avalanche Energy *	E_{AS}	95	mJ
Power Dissipation	P_D	40	W
Junction Temperature	T_J	+150	$^{\circ}C$
Storage Temperature	T_{STG}	-55~ +150	$^{\circ}C$

THERMAL CHARACTERISTICS

Parameter	Symbol	Typ	Unit
Junction to Case	R_{thJC}	3.13	$^{\circ}C/W$

Note: * EAS condition: $T_J=25^{\circ}C, V_{DS}=12V, V_G=10V, L=0.5mH, R_g=25\Omega$

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

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Off characteristics						
Drain to Source Breakdown Voltage	V _{DSS}	V _{GS} =0V,I _D =250μA	20	-	-	V
Drain to Source Leakage Current	I _{DSS}	V _{DS} =20V,V _{GS} =0V	-	-	1	μA
Gate to Source Forward Leakage	I _{GSS} (F)	V _{GS} =+12V ,V _{DS} =0V	-	-	100	nA
Gate to Source Reverse Leakage	I _{GSS} (R)	V _{GS} =-12V ,V _{DS} =0V	-	-	-100	nA
On characteristics						
Drain to Source On-Resistance	R _{DS(ON)}	V _{GS} =4.5V,I _D =10 A	-	5.6	7	mΩ
		V _{GS} =2.5V,I _D =10 A	-	6.8	7.8	mΩ
Gate Threshold Voltage	V _{GS(TH)}	V _{DS} =V _{GS} ,I _D =250μA	0.3	0.62	1.1	V
Dynamic characteristics						
Gate capacitance	R _g	V _{GS} =0V,V _{DS} =0V ,f=1.0MHz	-	1.6	-	Ω
Forward Transconductance	g _{fs}	V _{DS} =10V,I _D =3A	-	11	-	S
Input Capacitance	C _{iss}	V _{DS} =12V,V _{GS} =0V f=1.0MHz	-	1200	-	pF
Output Capacitance	C _{oss}		-	152	-	pF
Reverse Transfer Capacitance	C _{rss}		-	148	-	pF
Resistive Switching Characteristics						
Turn-on Delay Time	t _{d(ON)}	V _{GS} =4.5V,V _{DS} =10V, I _D =20 A ,R _G =3Ω	-	6.4	-	ns
Rise Time	t _r		-	17.2	-	ns
Turn-off Delay Time	t _{d(OFF)}		-	29.6	-	ns
Fall Time	t _f		-	16.8	-	ns
Total Gate Charge	Q _g	I _D =20 A, V _{DS} =10V V _{GS} =4.5V	-	35	-	nC
Gate to Source Charge	Q _{gs}		-	3	-	nC
Gate to Drain("Miller") Charge	Q _{gd}		-	10	-	nC
Source-Drain Diode Characteristics						
Continuous Source Current(Body Diode)	I _S		-	-	60	A
Maximum Pulsed Current(Body Diode)	I _{SM}		-	-	240	A
Diode Forward Voltage	V _{SD}	I _{SD} =1A, V _{GS} =0V	-	0.72	1.2	V
Reverse Recovery Time	t _{rr}	I _{SD} =20 A, T _J =25 °C dI /dt=100A/μs	-	25	-	ns
Reverse Recovery Charge	Q _{rr}		-	24	-	nC

■ TYPICAL CHARACTERISTICS

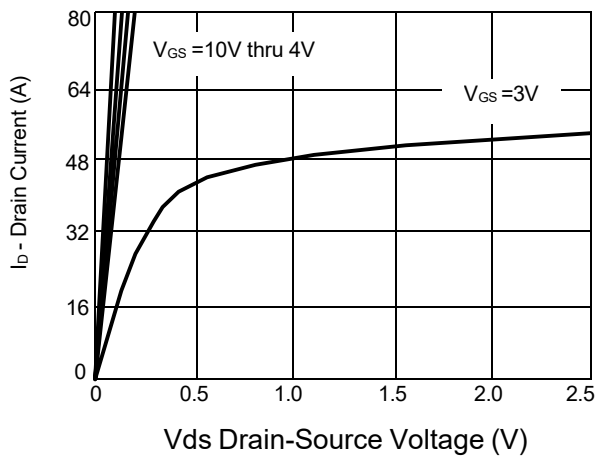


Figure 1: Output characteristics

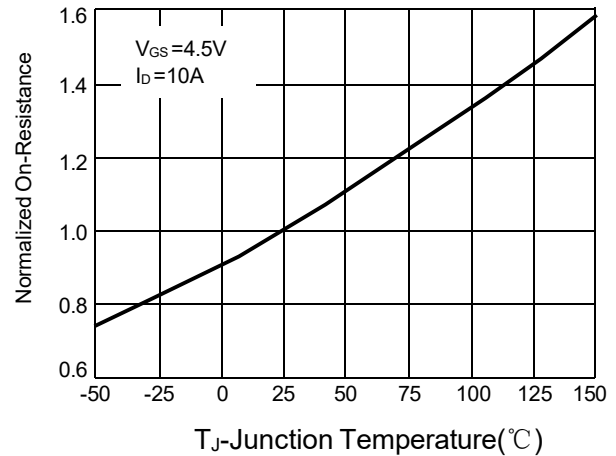


Figure 2: Rdson-junction temperature

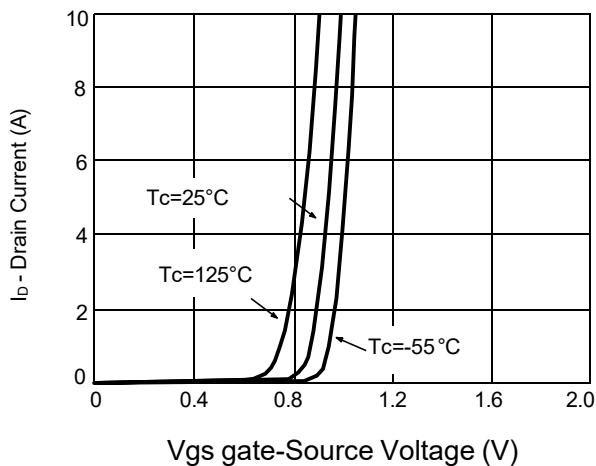


Figure 3: Transfer characteristics

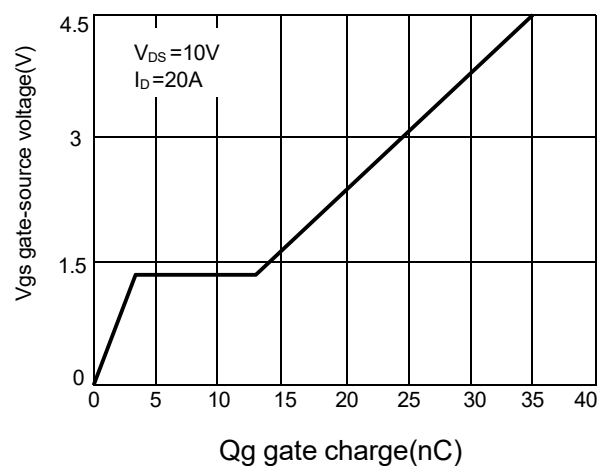


Figure 4: Gate charge

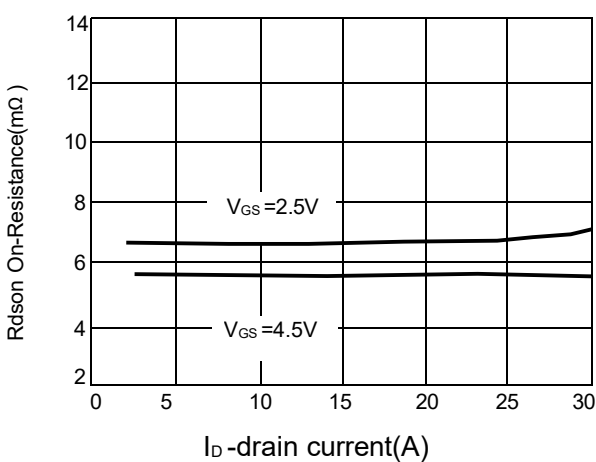


Figure 5: Rdson-drain current

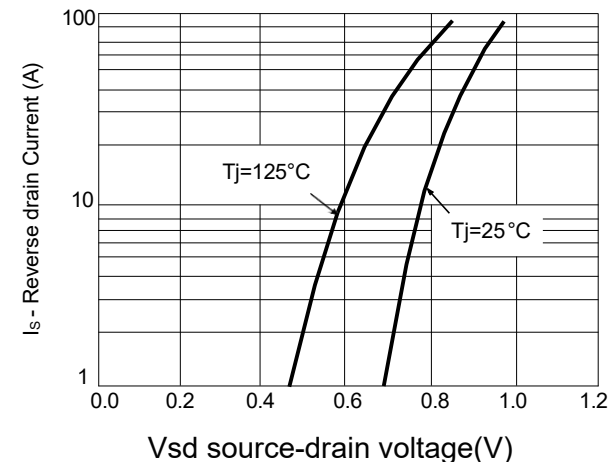


Figure 6: Source-drain diode forward

■ TYPICAL CHARACTERISTICS(Cont.)

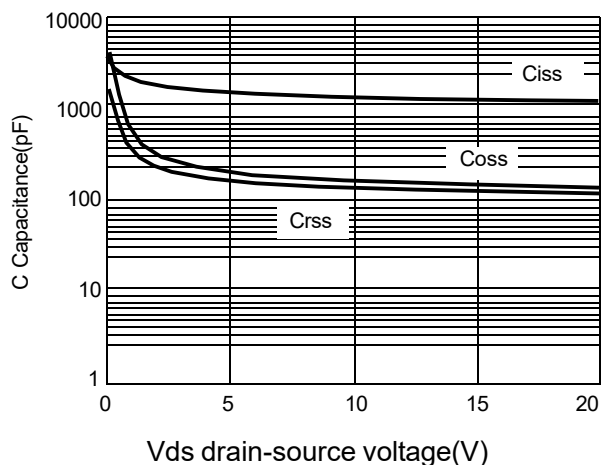


Figure 7: Capatitance de-rating

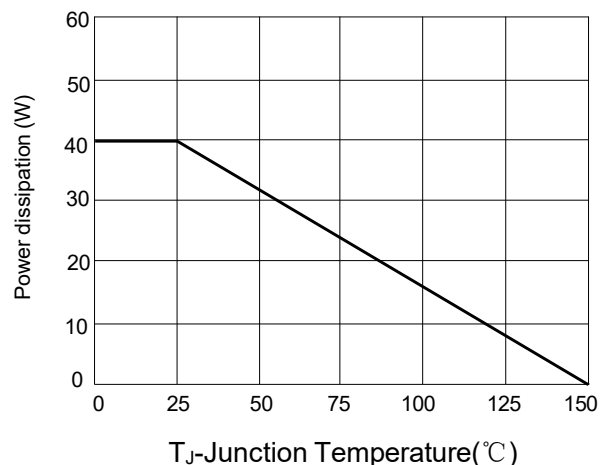


Figure 8: Power de-rating

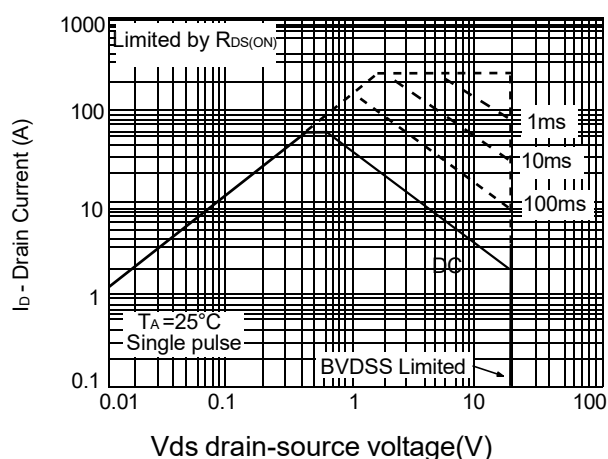


Figure 9: Safe operation area

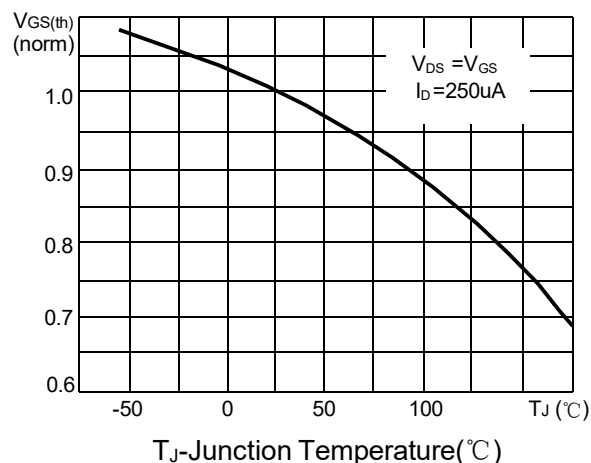


Figure 10: $V_{GS(th)}$ vs junction temperature

■ TO-252 PACKAGE OUTLINE DIMENSIONS

