

PRODUCT CHARACTERISTICS

V_{DSS}	30V
$R_{DS(ON)} Typ(@V_{GS}=10V)$	2.9m Ω
$R_{DS(ON)} Typ(@V_{GS}=4.5V)$	4.6m Ω
I_D	120A

APPLICATIONS

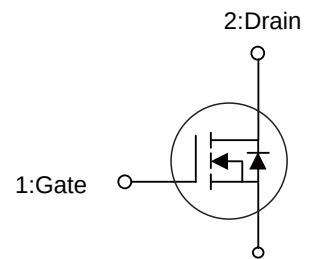
- * Electronic lamp ballasts based on half bridge
- * Load Switching, Quick/Wireless Charge.
- * Motor Driving

FEATURE

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



Symbol



3:Source



TO-252

ORDER INFORMATION

Order Codes		Package	Packing
Halogen-Free	Halogen		
N/A	MOT3138D	TO-252	2500 pieces/Reel

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

Parameter	Symbol	Ratings	Unit
Drain-Source Voltage	V_{DSS}	30	V
Gate-Source Voltage	V_{GSS}	± 20	V
Drain Current Continuous($@V_{GS}=10V, T_A=25^{\circ}C$)	I_D	120	A
Drain Current Continuous($@V_{GS}=10V, T_A=100^{\circ}C$)	I_D	84	A
Drain Current Pulsed	I_{DM}	480	A
Avalanche Energy *	E_{AS}	225	mJ
Power Dissipation	P_D	93	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}	1.34	$^{\circ}C/W$

Note: * EAS condition: $T_J=25^{\circ}C, V_{DD}=20V, V_G=10V, L=0.5mH, R_g=25\Omega$

■ 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	30	-	-	V
Drain to Source Leakage Current	I _{DSS}	V _{DS} =30V,V _{GS} =0V	-	-	1	μA
Gate to Source Forward Leakage	I _{GSS(F)}	V _{GS} =+20V,V _{DS} =0V	-	-	100	nA
Gate to Source Reverse Leakage	I _{GSS(R)}	V _{GS} =-20V ,V _{DS} =0V	-	-	-100	nA
On characteristics						
Drain to Source On-Resistance	R _{DS(ON)}	V _{GS} =10V,I _D =20 A	-	2.9	3.8	mΩ
		V _{GS} =4.5V,I _D =20 A	-	4.6	5.8	mΩ
Gate Threshold Voltage	V _{GS(TH)}	V _{DS} =V _{GS} ,I _D =250μA	0.8	1.4	2	V
Dynamic characteristics						
Gate capacitance	R _g	V _{GS} =0V,V _{DS} =0V ,f=1.0MHz	-	2.0	-	Ω
Forward Transconductance	g _{fs}	V _{DS} =5V,I _D =5A	-	15	-	S
Input Capacitance	C _{iss}	V _{DS} =20V,V _{GS} =0V f=1.0MHz	-	2000	-	pF
Output Capacitance	C _{oss}		-	268	-	pF
Reverse Transfer Capacitance	C _{rss}		-	232	-	pF
Resistive Switching Characteristics						
Turn-on Delay Time	t _{d(ON)}	V _{GS} =10V, V _{DS} =20V, I _D =20 A ,R _G =3Ω	-	12	-	ns
Rise Time	t _r		-	9	-	ns
Turn-off Delay Time	t _{d(OFF)}		-	45	-	ns
Fall Time	t _f		-	15	-	ns
Total Gate Charge	Q _g	I _D =20 A, V _{DS} =20V V _{GS} =10V	-	58	-	nC
Gate to Source Charge	Q _{gs}		-	13	-	nC
Gate to Drain("Miller") Charge	Q _{gd}		-	21	-	nC
Source-Drain Diode Characteristics						
Continuous Source Current(Body Diode)	I _s		-	-	120	A
Maximum Pulsed Current(Body Diode)	I _{SM}		-	-	480	A
Diode Forward Voltage	V _{SD}	I _{SD} =1A, V _{GS} =0V	-	0.71	1.2	V
Reverse Recovery Time	t _{rr}	I _{SD} =20 A, T _j =25℃ dI/dt=100A/μs	-	68	-	ns
Reverse Recovery Charge	Q _{rr}		-	121	-	nC

■ TYPICAL CHARACTERISTICS

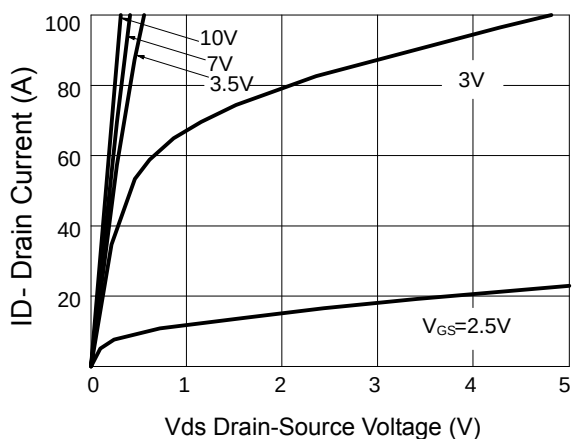


Figure 1: Output characteristics

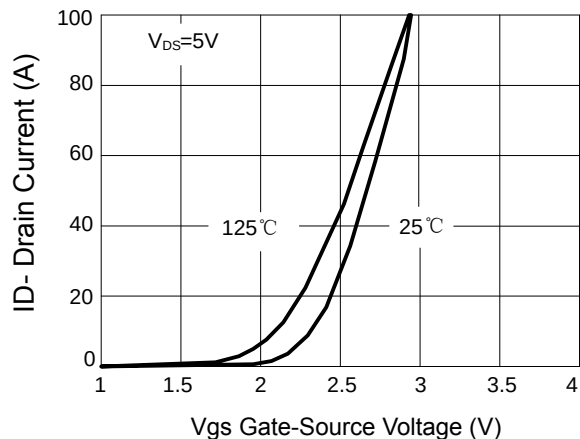


Figure 2: Transfer characteristics

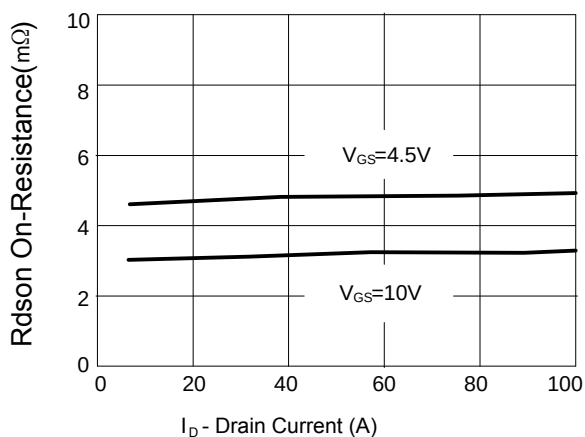


Figure 3: Rdson-drain-current

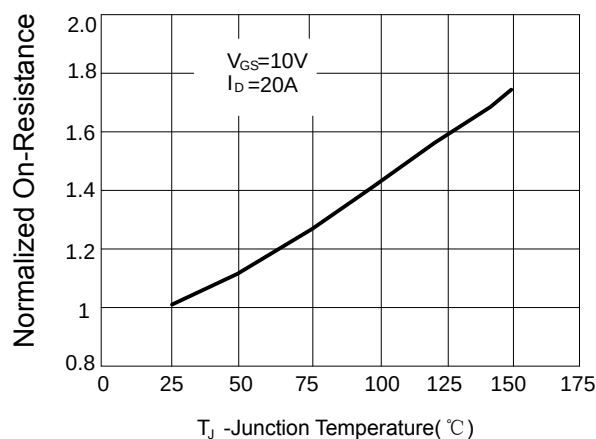


Figure 4: Rdson-temperature

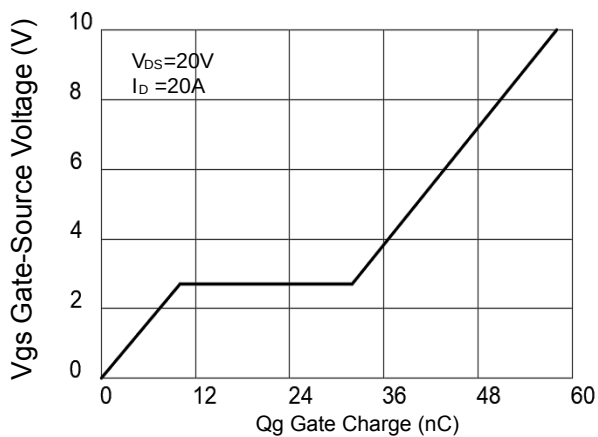


Figure 5: Gate charge

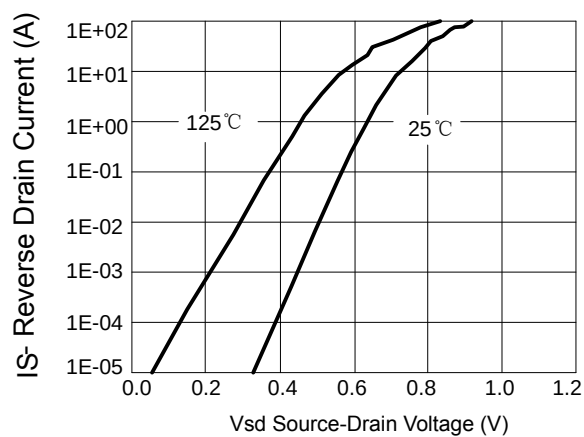


Figure 6: Source-drain diode forward

■ TYPICAL CHARACTERISTICS(Cont.)

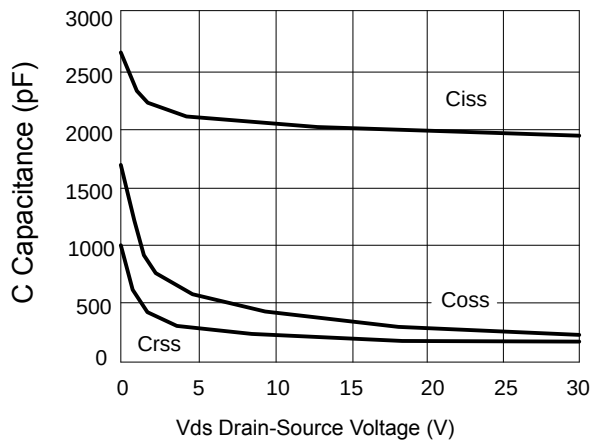


Figure 7: Capacitance vs vds

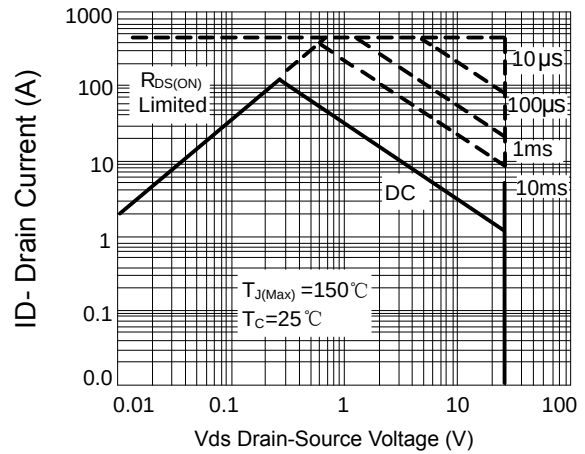


Figure 8: Safe operating area

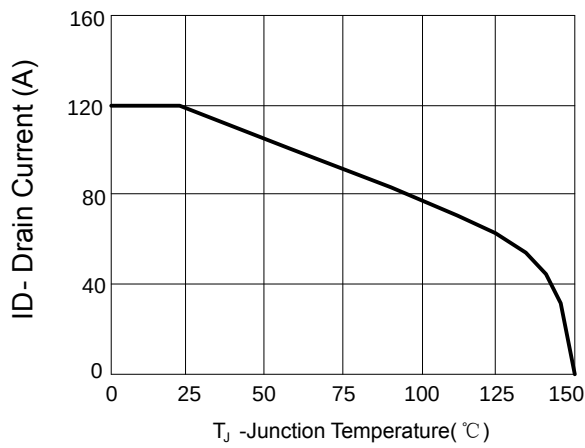


Figure 9: Current de-rating

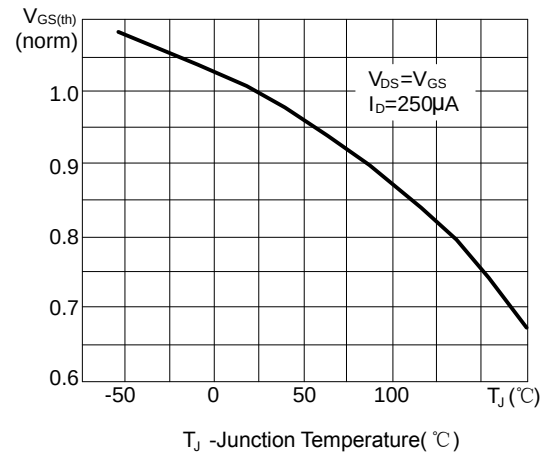


Figure 10: Vgs vs junction temperature

■ TO-252 PACKAGE OUTLINE DIMENSIONS

