

PRODUCT CHARACTERISTICS

VDSS	30V
$R_{DS(on)Typ}(V_{GS}=10V)$	2.5mΩ
$R_{DS(on)Typ}(V_{GS}=4.5V)$	3.5mΩ
ID	130A

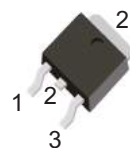
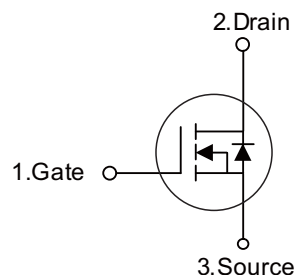
APPLICATIONS

Power switching circuit of adaptor and charge

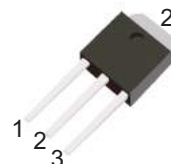
FEATURES

Fast switching
Low ON resistance
Low gate charge
Low reverse transfer capacitances

Symbol



TO-252



TO-251

ORDER INFORMATION

Order codes		Package	Packing
Halogen-Free	Halogen		
N/A	MOT130N03D	TO-252	2500 pieces /Reel
N/A	MOT130N03C	TO-251	70 pieces/Tube

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

Parameter	Symbol	Rating	Units
Drain-to-Source Voltage	V_{DSS}	30	V
Continuous Drain Current $T_C = 25^{\circ}\text{C}$	I_D	130	A
Continuous Drain Current $T_C = 100^{\circ}\text{C}$ (Package limited)	I_D	60	A
Pulsed Drain Current $T_C = 25^{\circ}\text{C}$ (Package limited)	I_{DM}	240	A
Gate-to-Source Voltage	V_{GS}	± 20	V
Single Pulse Avalanche Energy	E_{AS}	540	mJ
Power Dissipation $T_C = 25^{\circ}\text{C}$	P_D	83	W
Derating Factor above 25°C		0.666	W/ $^{\circ}\text{C}$
Operating Junction and Storage Temperature Range	T_J, T_{stg}	-55 to 150	$^{\circ}\text{C}$

THERMAL DATA

Parameter	Symbol	Max.	Units
Junction-to-Case	$R_{\theta JC}$	1.5	$^{\circ}\text{C}/\text{W}$
Junction-to-Ambient	$R_{\theta JA}$	100	$^{\circ}\text{C}/\text{W}$

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

Parameter	Symbol	Test Conditions	Min.	Typ.	Max.	Units
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
		V _{DS} =24V, V _{GS} = 0V, T _J = 125℃	-	-	100	μA
Gate to Source Forward Leakage	I _{GSS(F)}	V _{GS} =+20V	-	-	100	nA
Gate to Source Reverse Leakage	I _{GSS(R)}	V _{GS} =-20V	-	-	-100	nA
Drain-to-Source On-Resistance	R _{DS(ON)}	V _{GS} =10V,I _D =19A	-	2.5	3.5	mΩ
		V _{GS} =4.5V,I _D =19A	-	3.5	4.8	mΩ
Gate Threshold Voltage	V _{GS(TH)}	V _{DS} = V _{GS} , I _D = 250 μA	1.0	-	3.0	V
Dynamic Characteristics						
Gate resistance	R _g	V _{GS} =0V, V _{DS} =0V, f=1MHz	-	2.3	-	Ω
Input Capacitance	C _{iss}	V _{GS} =0V, V _{DS} =15V f=1.0MHz	-	2400	-	pF
Output Capacitance	C _{oss}		-	380	-	
Reverse Transfer Capacitance	C _{rss}		-	350	-	
Resistive Switching Characteristics						
Turn-on Delay Time	t _{d(ON)}	V _{GS} =10V, R _G =6Ω V _{DD} =15V, I _D =50A	-	14.8	-	ns
Rise Time	tr		-	15.2	-	
Turn-Off Delay Time	t _{d(OFF)}		-	119.6	-	
Fall Time	t _f		-	59.2	-	
Total Gate Charge	Q _g	V _{GS} =10V, V _{DD} =15V I _D =50A	-	79.1	-	nC
Gate to Source Charge	Q _{gs}		-	13.6	-	
Gate to Drain (“Miller”)Charge	Q _{gd}		-	16.0	-	
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 _S =50A,V _{GS} =0V	-	-	1.2	V
Reverse Recovery Time	trr	I _S =50A,T _j = 25℃ dI _F /dt=100A/us,	-	44.4	-	ns
Reverse Recovery Charge	Q _r		-	34.6	-	nC
Reverse Recovery Current	I _{RRM}		-	1.6	-	A

■ TEST CIRCUIT AND WAVEFORM

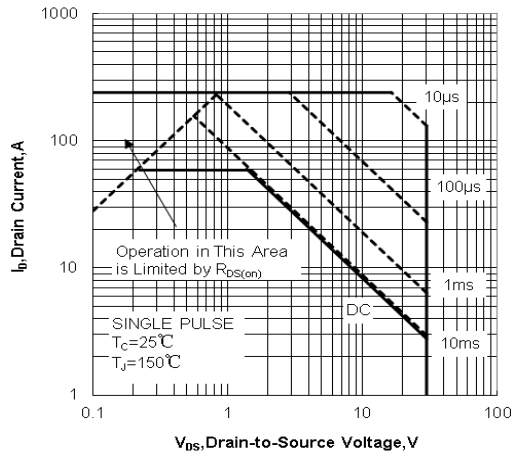


Figure1. Maximum Forward Bias Safe Operating Area

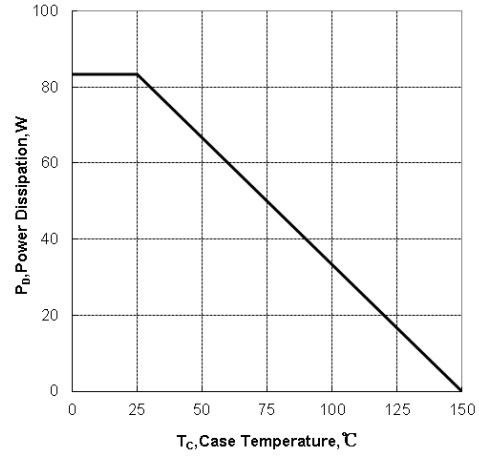


Figure2. Maximum Power Dissipation vs Case Temperature

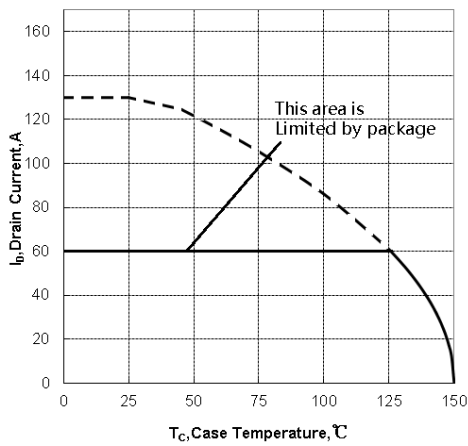


Figure3. Maximum Continuous Drain Current vs Case Temperature

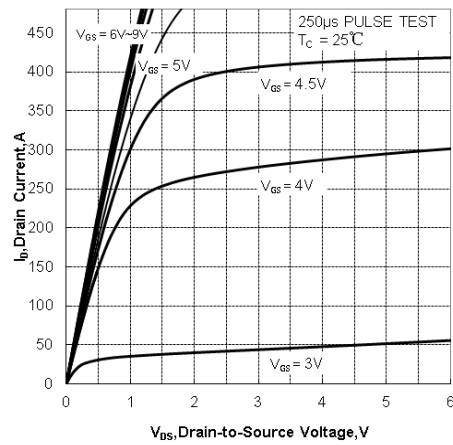


Figure 4. Typical Output Characteristics

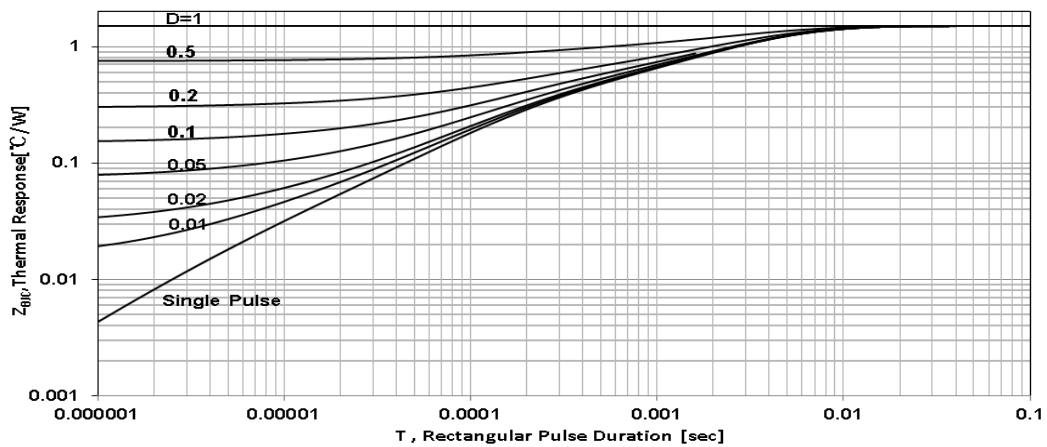


Figure5. Maximum Effective Transient Thermal Impedance, Junction-to-Case

■ TYPICAL CHARACTERISTICS

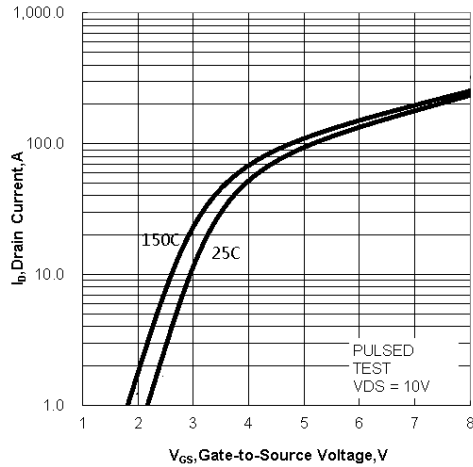


Figure 6. Typical Transfer Characteristics

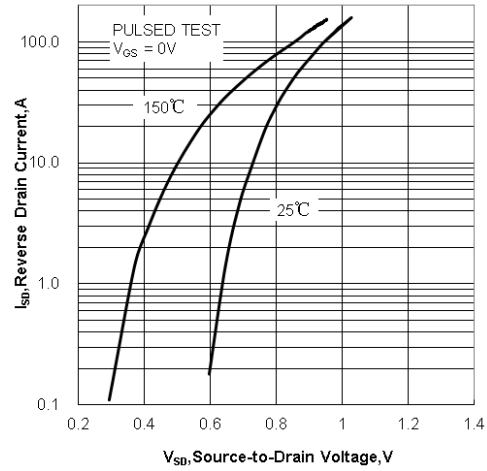


Figure 7. Typical Body Diode Transfer Characteristics

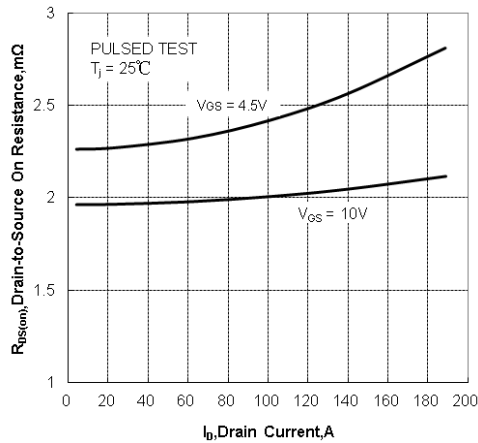


Figure 8. Drain-to-Source On Resistance vs Drain Current

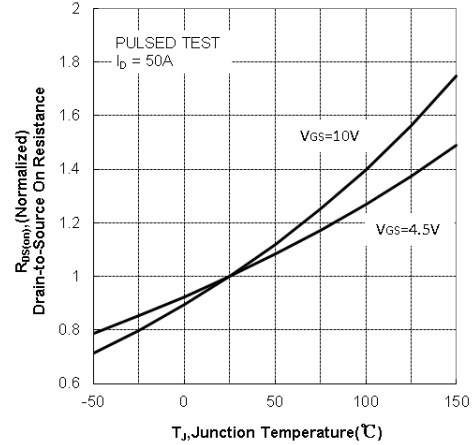


Figure 9. Normalized on Resistance vs Junction Temperature

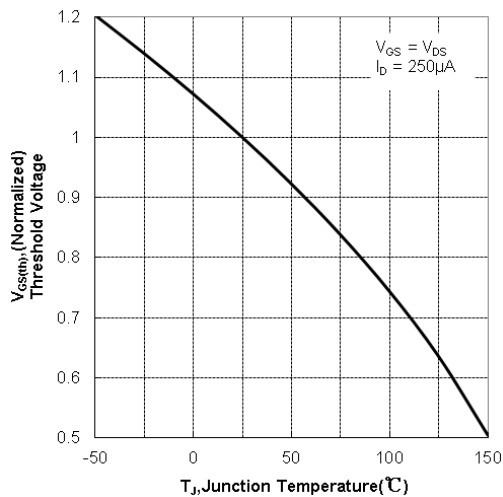


Figure 10. Normalized Theshold Voltage vs Junction Temperature

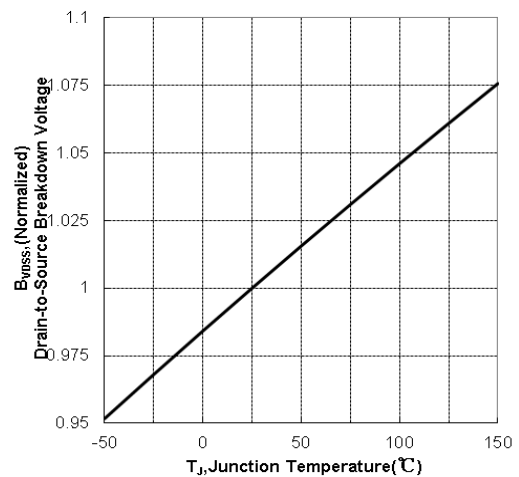
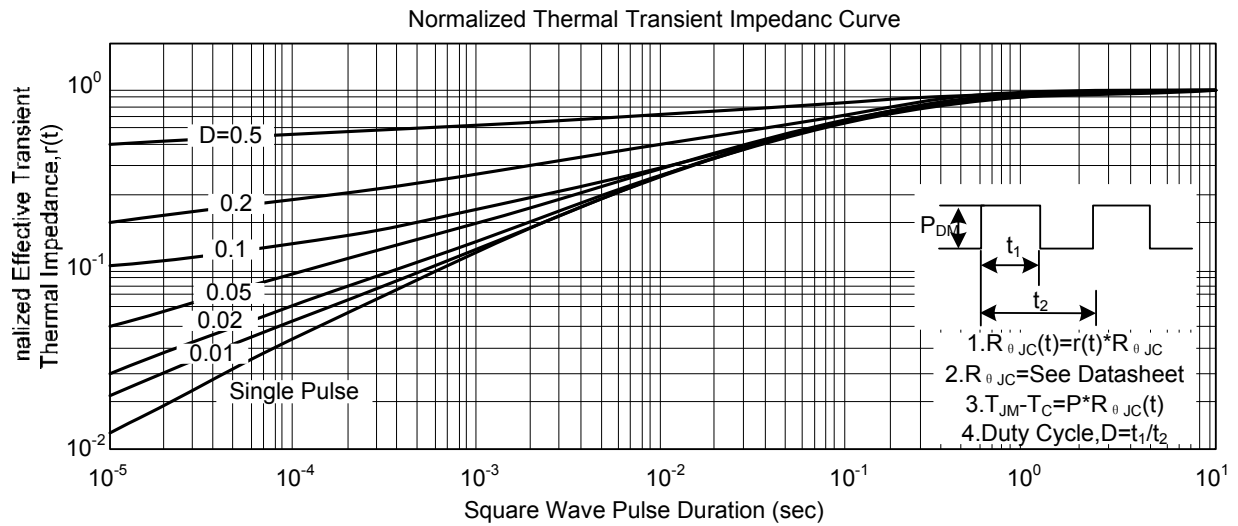
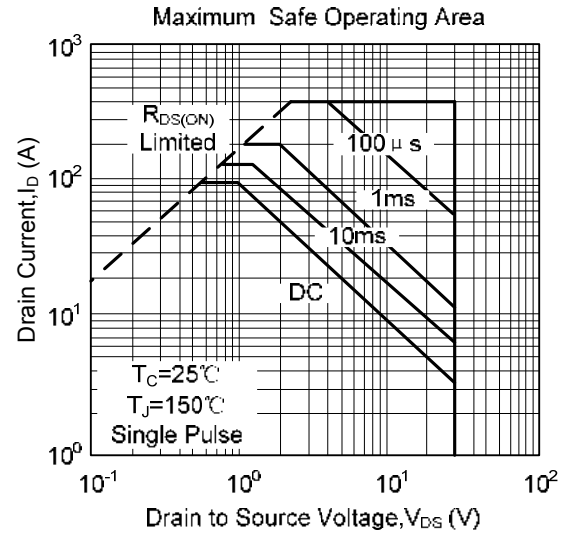
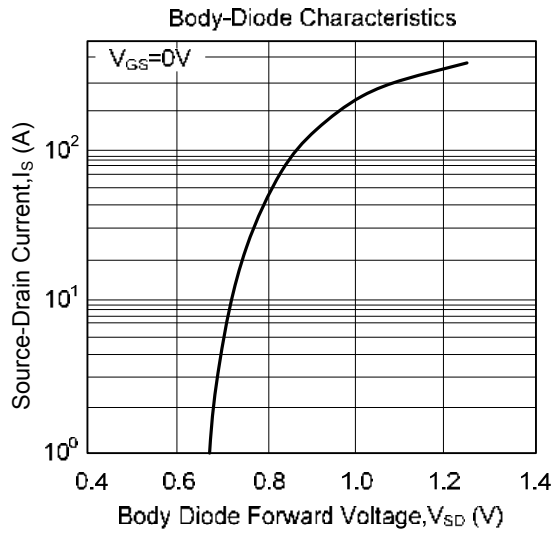
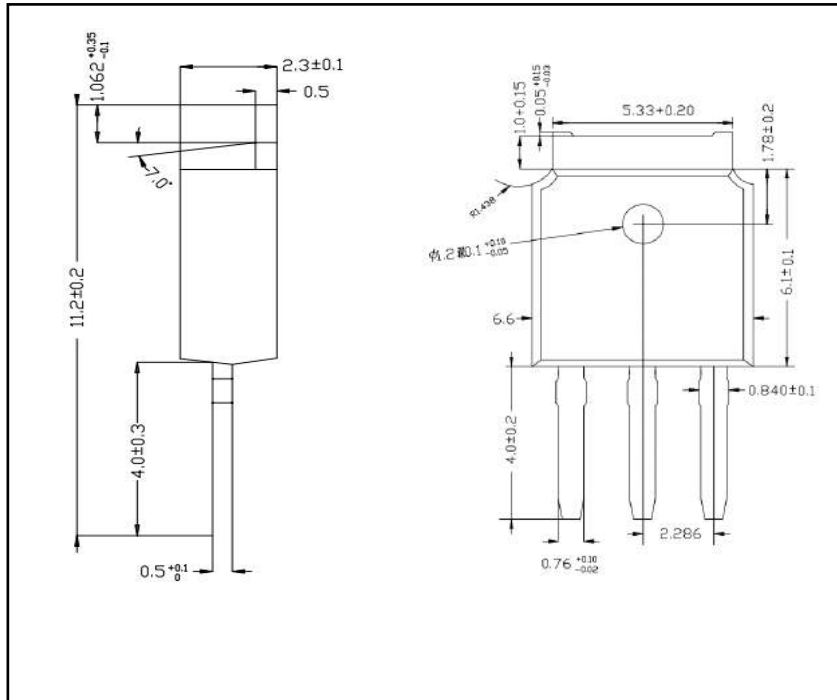


Figure 11. Normalized Breakdown Voltage vs Junction Temperature

■ TYPICAL CHARACTERISTICS(Cont.)



■ TO-251 PACKAGE OUTLINE DIMENSIONS



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