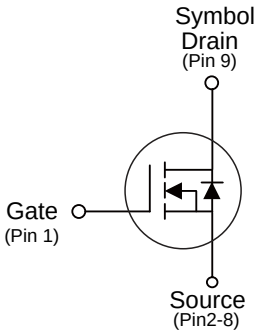
■ PRODUCT CHARACTERISTICS

V_{DSS}	150V
$R_{DS(ON)}$Typ(@V_{GS}=10V)	3.4mΩ
Qg@typ	128nC
I_D	220A





TOLL

■ APPLICATIONS

* Battery Management
* Motor Control and Drive
* Switching Applications

■ FEATURE

* Low Gate Charge
* Low Reverse Transfer Capacitance
* 100% Avalanche Tested

■ ORDER INFORMATION

Order Codes		Package	Packing
Halogen-Free	Halogen		
MOT7138T	N/A	TOLL	2000 pieces/Reel

■ ABSOLUTE MAXIMUM RATINGS(T_A=25°C,unless otherwise specified)

Parameter	Symbol	Ratings	Unit
Drain-Source Voltage	V_{DSS}	150	V
Gate-Source Voltage	V_{GSS}	±20	V
Drain Current Continuous(@V_{GS}=10V,T_A=25°C)	I_D	220	A
Drain Current Continuous(@V_{GS}=10V,T_A=100°C)	I_D	150	A
Drain Current Pulsed	I_{DM}	880	A
Avalanche Energy *	E_{AS}	2651	mJ
Power Dissipation	P_D	350	W
Junction Temperature	T_J	+175	°C
Storage Temperature	T_{STG}	-55~ +175	°C

■ THERMAL CHARACTERISTICS

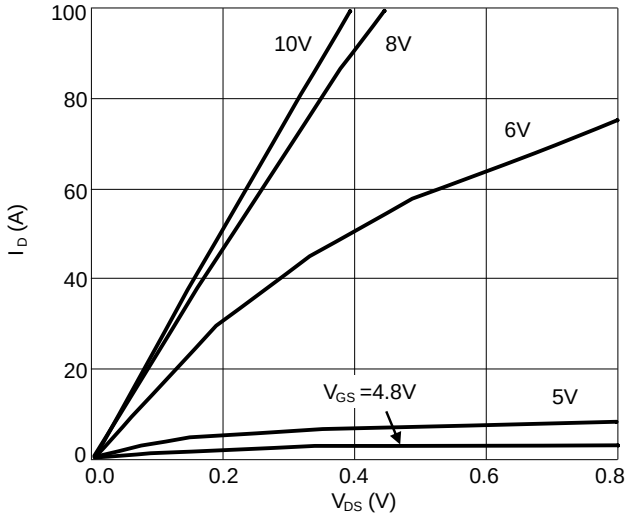
Parameter	Symbol	Typ	Unit
Junction to Case	R_{thJC}	0.43	°C/W

Note: * EAS condition: T_J=25°C,V_{DD}=50V,V_G=10V,L=0.5mH,R_g=25Ω

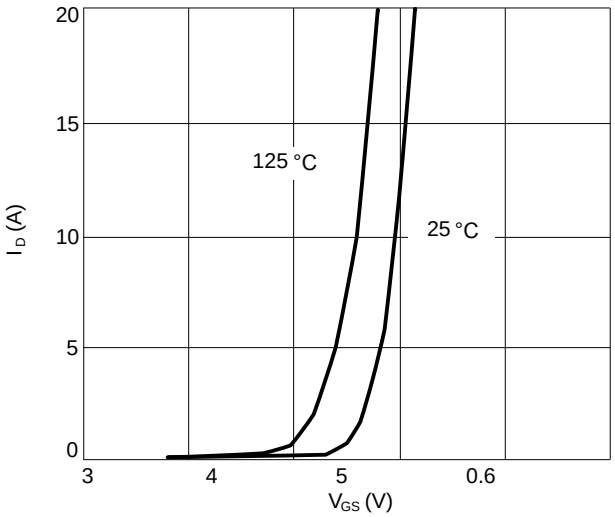
■ ELECTRICAL CHARACTERISTICS (T_C=25°C, unless otherwise noted)

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Off characteristics						
Drain to Source Breakdown Voltage	V_{DSS}	V_{GS}=0V,I_D=250μA	150	-	-	V
Drain to Source Leakage Current	I_{DSS}	V_{DS}=150V,V_{GS}=0V	-	-	1	μA
Gate to Source Forward Leakage	$I_{GSS(F)}$	V_{DS}=0V, V_{GS}=+20V	-	-	100	nA
Gate to Source Reverse Leakage	$I_{GSS(R)}$	V_{DS}=0V, V_{GS}=-20V	-	-	-100	nA
On characteristics						
Drain to Source On-Resistance	$R_{DS(ON)}$	V_{GS}=10V,I_D=20A	-	3.4	4	mΩ
Gate Threshold Voltage	$V_{GS(TH)}$	V_{DS}=V_{GS},I_D=250μA	2	3	4	V
Dynamic characteristics						
Gate capacitance	R_g	V_{GS}=0V,V_{DS}=0V ,f=1.0MHz	-	3.8	-	Ω
Forward Transconductance	g_{fs}	V_{DS}=10V,I_D=5A	-	27	-	S
Input Capacitance	C_{iss}	V_{DS}=25V,V_{GS}=0V f=1.0MHz	-	5000	-	pF
Output Capacitance	C_{oss}		-	3400	-	pF
Reverse Transfer Capacitance	C_{rss}		-	166	-	pF
Resistive Switching Characteristics						
Turn-on Delay Time	$t_{d(ON)}$	I_D=20A, V_{DS}=75V R_G=6Ω ,V_{GS}=10V	-	18	-	ns
Rise Time	t_r		-	64	-	ns
Turn-off Delay Time	$t_{d(OFF)}$		-	92	-	ns
Fall Time	t_f		-	60	-	ns
Total Gate Charge	Q_g	I_D=20A, V_{DS}=75V V_{GS}=10V	-	128	-	nC
Gate to Source Charge	Q_{gs}		-	35	-	nC
Gate to Drain("Miller") Charge	Q_{gd}		-	30	-	nC
Source-Drain Diode Characteristics						
Continuous Source Current(Body Diode)	I_S		-	-	220	A
Maximum Pulsed Current(Body Diode)	I_{SM}		-	-	880	A
Diode Forward Voltage	V_{SD}	I_{SD}=1A, V_{GS}=0V	-	0.66	1.2	V
Reverse Recovery Time	t_{rr}	I_{SD} =20A, T_J=25°C dI/dt=100A/μs	-	130	-	ns
Reverse Recovery Charge	Q_{rr}		-	600	-	nC

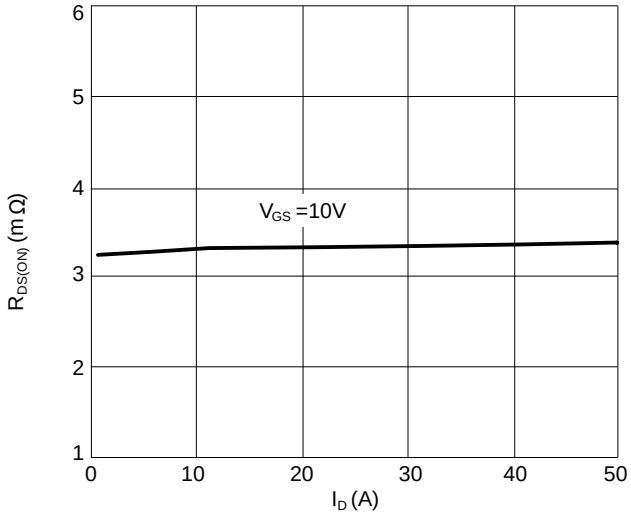
■ TYPICAL CHARACTERISTICS



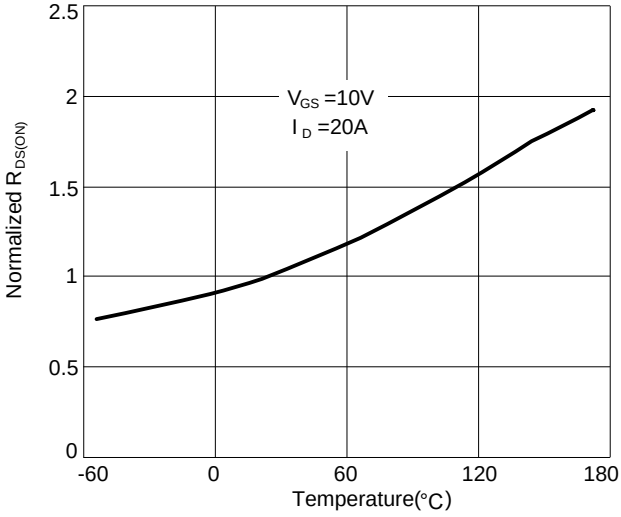
Fifure 1: Output Characteristics



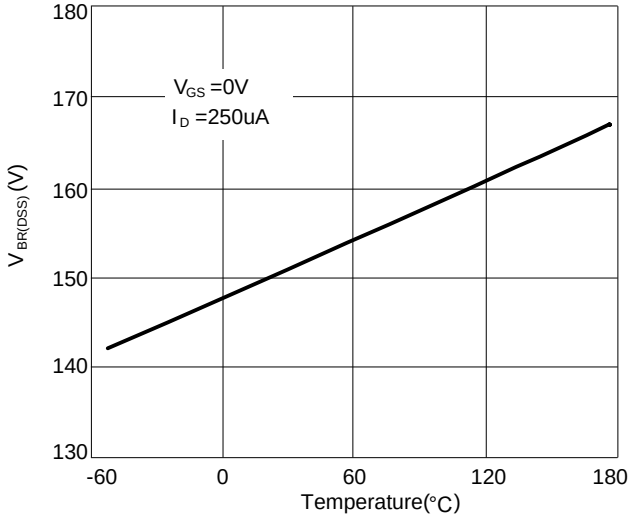
Fifure 2: Transfer Characteristics



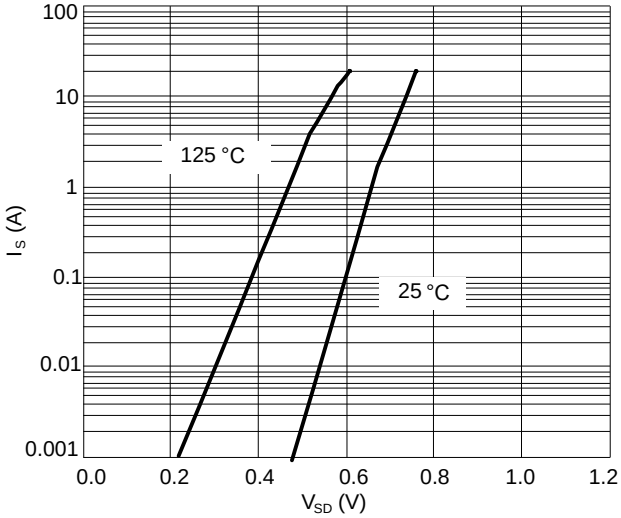
Fifure 3: $R_{DS(ON)}$ vs. Drain Current



Fifure 4: $R_{DS(ON)}$ vs. Junction Temperature

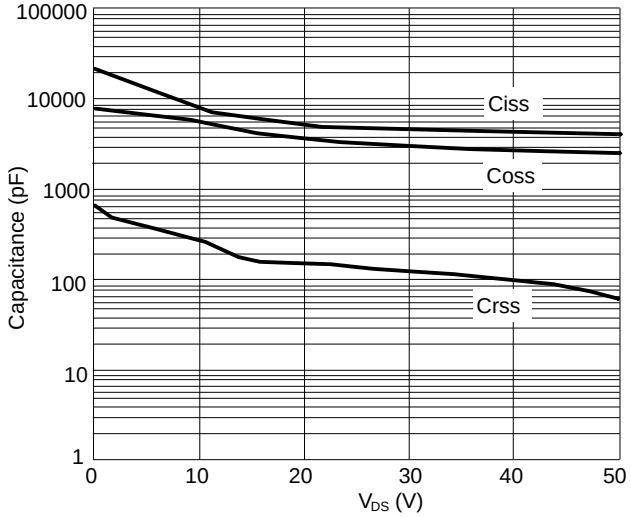


Fifure 5: $V_{BR(DSS)}$ vs. Junction Temperature

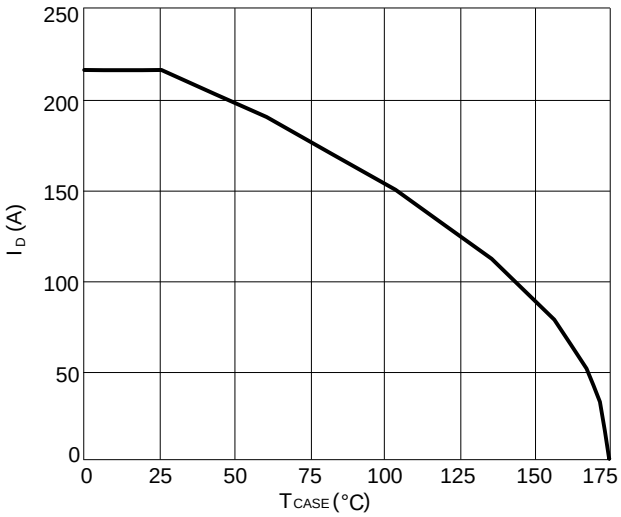


Fifure 6: Body-Diode Characteris

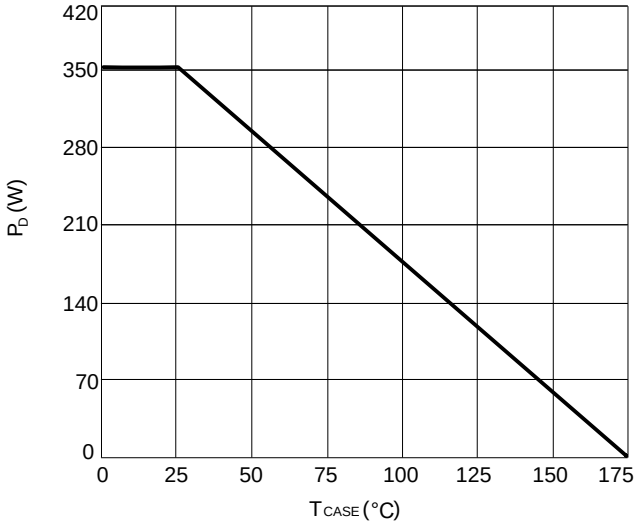
■ TYPICAL CHARACTERISTICS(Cont.)



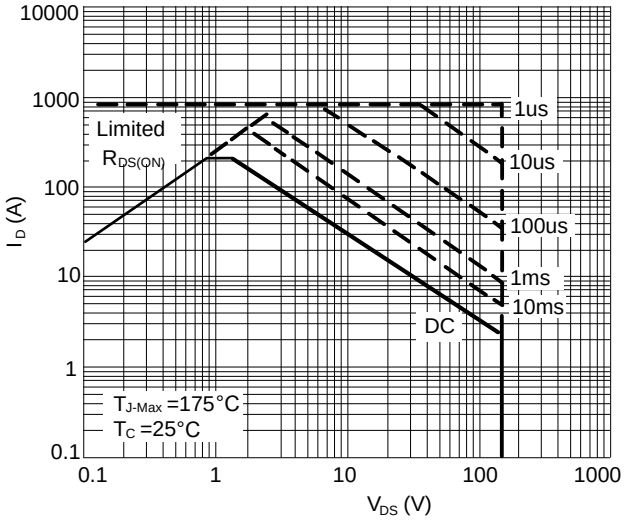
Fifure 7: Capacitance Characteristics



Fifure 8: Current De-rating



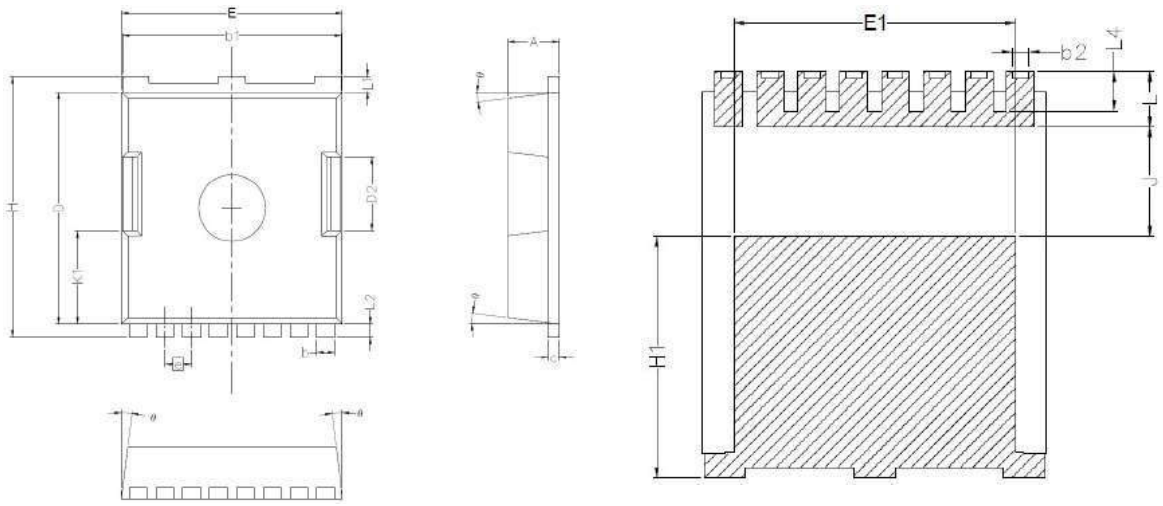
Fifure 9: Power De-rating



Fifure 10: Safe Operation Area

°C

■ TOLL PACKAGE OUTLINE DIMENSIONS



Symbol	Dimesions In Millimeters	
	Min.	Max.
A	2.20	2.40
b	0.70	0.90
b1	9.70	9.90
b2	0.42	0.50
c	0.40	0.60
D	10.28	10.58
D2	3.10	3.50
E	9.70	10.10
E1	7.90	8.30
e	1.20BSC	
H	11.48	11.88
H1	6.75	7.15
N	8	
J	3.00	3.30
K1	3.98	4.38
L	1.40	1.80
L1	0.60	0.80
L2	0.50	0.70
L4	1.00	1.30
θ	4°	10°