

PRODUCT CHARACTERISTICS

V_{DS}	40V
$R_{DS(ON)}$ Typ(@ $V_{GS}=10V$)	0.6m Ω
Qg@typ	145nC
I_D	491A

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		
MOT4557T	N/A	TOLL	2000 pieces/Reel

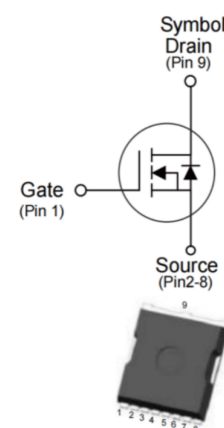
ABSOLUTE MAXIMUM RATINGS($T_A=25^{\circ}C$, unless otherwise specified)

Parameter	Symbol	Ratings	Unit
Drain-Source Voltage	V_{DS}	40	V
Gate-Source Voltage	V_{GS}	± 20	V
Drain Current Continuous(@ $V_{GS}=10V, T_A=25^{\circ}C$)	I_D	491	A
Drain Current Continuous(@ $V_{GS}=10V, T_A=100^{\circ}C$)	I_D	350	A
Drain Current Pulsed	I_{DM}	1964	A
Avalanche Energy *	E_{AS}	2304	mJ
Power Dissipation	P_D	350	W
Junction Temperature	T_J	+175	$^{\circ}C$
Storage Temperature	T_{STG}	-55~ +175	$^{\circ}C$

THERMAL CHARACTERISTICS

Parameter	Symbol	Typ	Unit
Junction to Case	R_{thJC}	0.5	$^{\circ}C/W$

Note: * EAS condition: $T_J=25^{\circ}C, V_{DD}=30V, V_G=10V, L=0.5mH, R_g=25\Omega$



TOLL



■ 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	40	-	-	V
Drain to Source Leakage Current	I _{DSS}	V _{DS} =40V, 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 =50A	-	0.6	0.8	mΩ
Gate Threshold Voltage	V _{GS(TH)}	V _{DS} =V _{GS} , I _D =250μA	2	2.9	4	V
Dynamic characteristics						
Gate Resistance	R _g	V _{GS} =0V, V _{DS} =0V ,f=1.0MHz	-	0.8	-	Ω
Forward Transconductance	g _{fs}	V _{DS} =10V, I _D =5A	-	9	-	S
Input Capacitance	C _{iss}	V _{DS} =50V, V _{GS} =0V f=1.0MHz	-	11601	-	pF
Output Capacitance	C _{oss}		-	2863	-	pF
Reverse Transfer Capacitance	C _{rss}		-	175	-	pF
Resistive Switching Characteristics						
Turn-on Delay Time	t _{d(ON)}	I _D =20A, V _{DS} =20V R _G =4.5 Ω ,V _{GS} =10V	-	32	-	ns
Rise Time	t _r		-	65	-	ns
Turn-off Delay Time	t _{d(OFF)}		-	75	-	ns
Fall Time	t _f		-	40	-	ns
Total Gate Charge	Q _g	I _D =20A, V _{DS} =20V V _{GS} =10V	-	145	-	nC
Gate to Source Charge	Q _{gs}		-	35	-	nC
Gate to Drain("Miller") Charge	Q _{gd}		-	25	-	nC
Source-Drain Diode Characteristics						
Continuous Source Current(Body Diode)	I _s		-	-	491	A
Maximum Pulsed Current(Body Diode)	I _{SM}		-	-	1964	A
Diode Forward Voltage	V _{SD}	I _{SD} =1 A, V _{GS} =0V	-	0.66	1.3	V
Reverse Recovery Time	t _{rr}	I _{SD} =20A, T _J =25 °C	-	68	-	ns
Reverse Recovery Charge	Q _{rr}	dI /dt=100A/μs	-	120	-	nC

TYPICAL CHARACTERISTICS

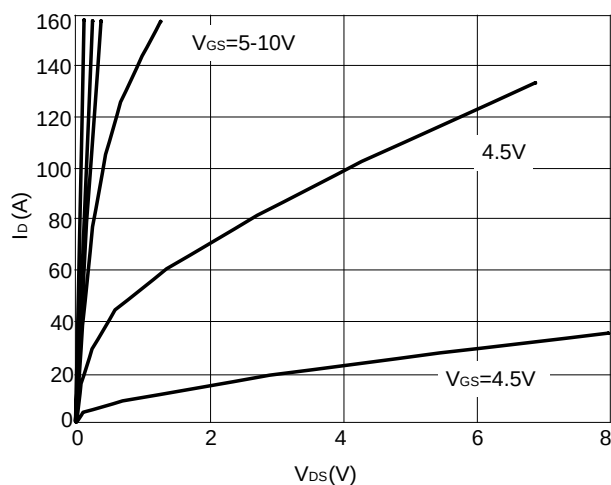


Figure 1: Output Characteristics

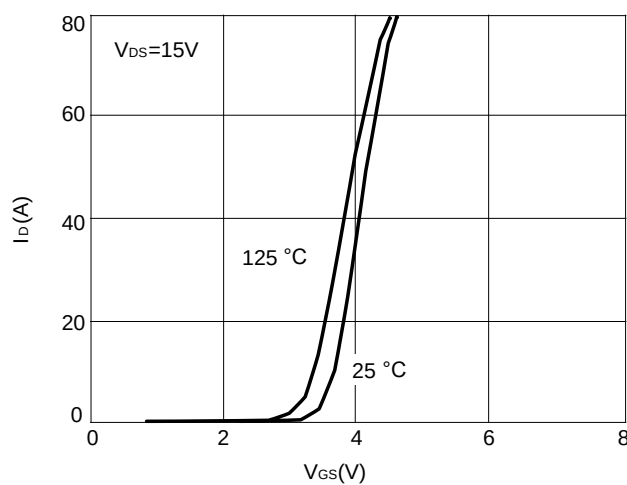


Figure 2: Typical Transfer Characteristics

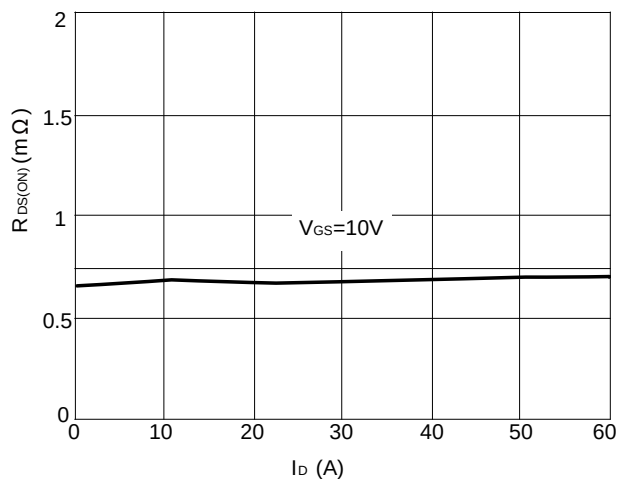


Figure 3: On-Resistance vs. Drain Current

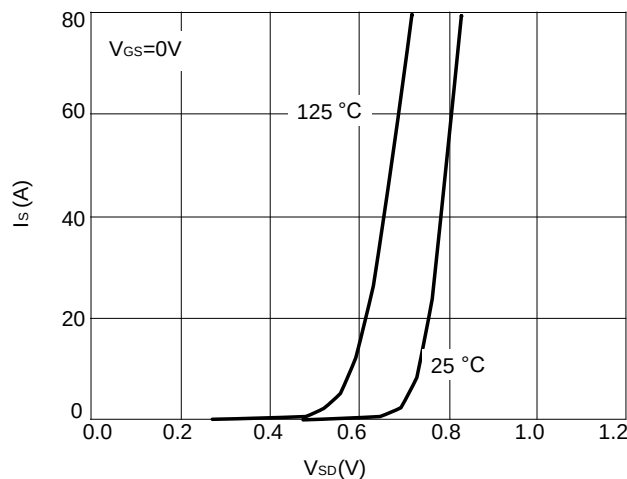


Figure 4: Body Diode Characteristics

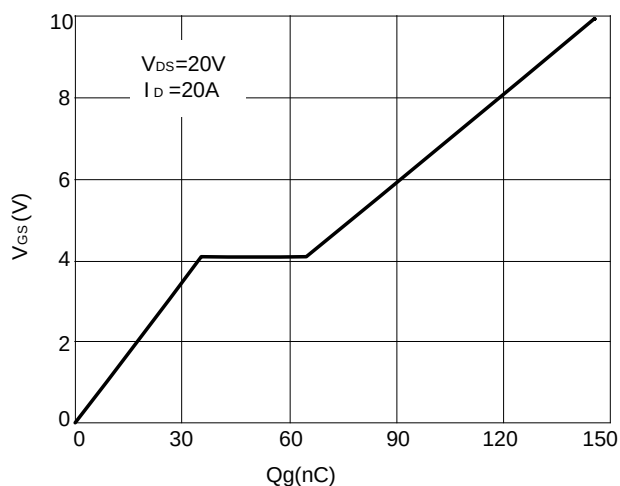


Figure 5: Gate Charge Characteristics

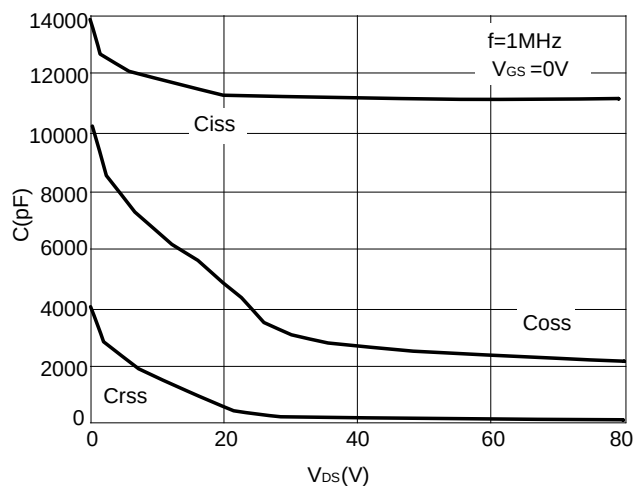


Figure 6: Capacitance Characteristics

TYPICAL CHARACTERISTICS(Cont.)

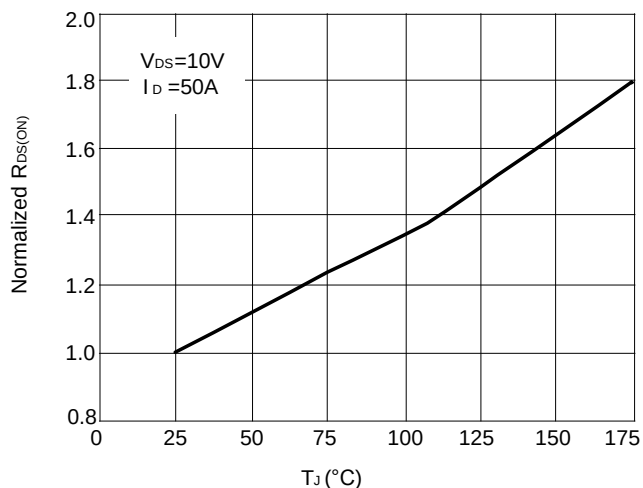


Figure 7: Normalized on-Resistance vs. Junction Temperature

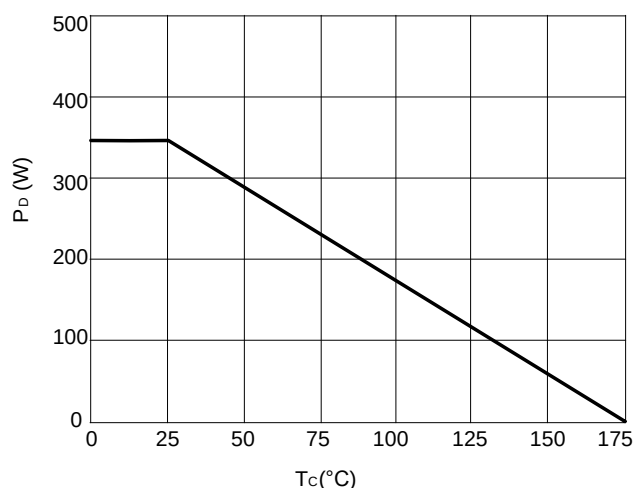


Figure 8: Power De-rating

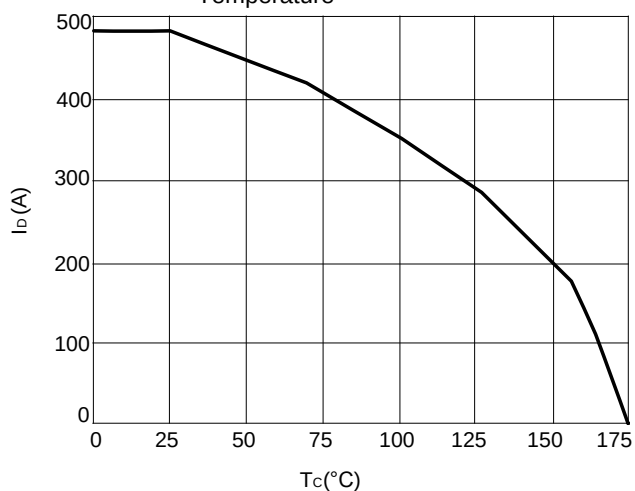


Figure 9: Current De-rating

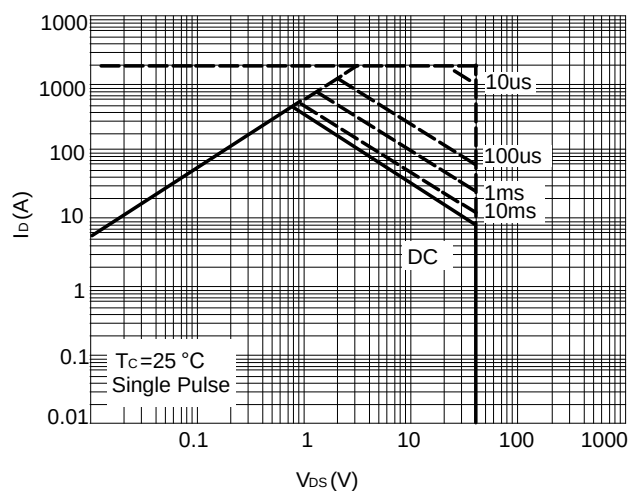


Figure 10: Maximum Safe Operating Area

TYPICAL CHARACTERISTICS(Cont.)

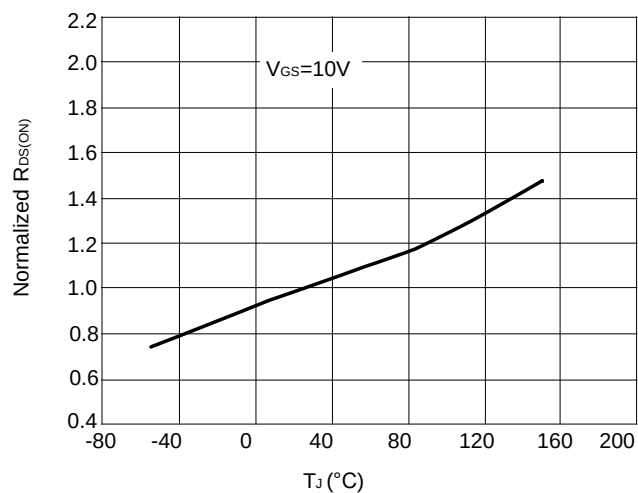


Figure 8: Normalized on-Resistance vs. Junction Temperature

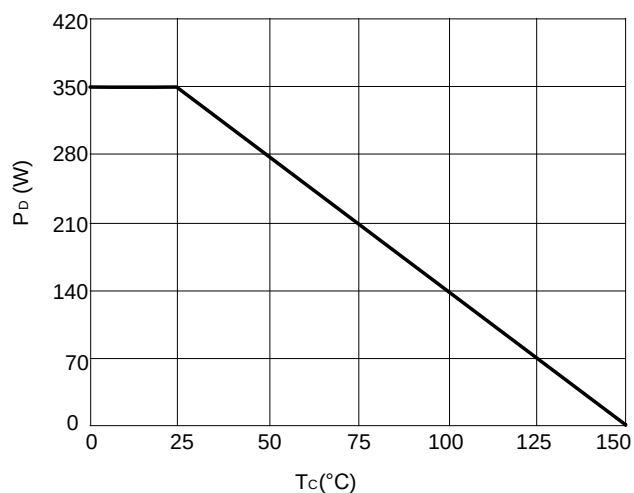


Figure 10: Power De-rating

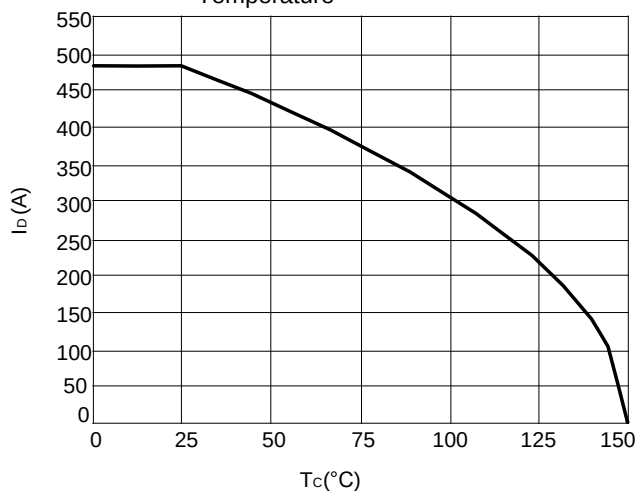


Figure 11: Current De-rating

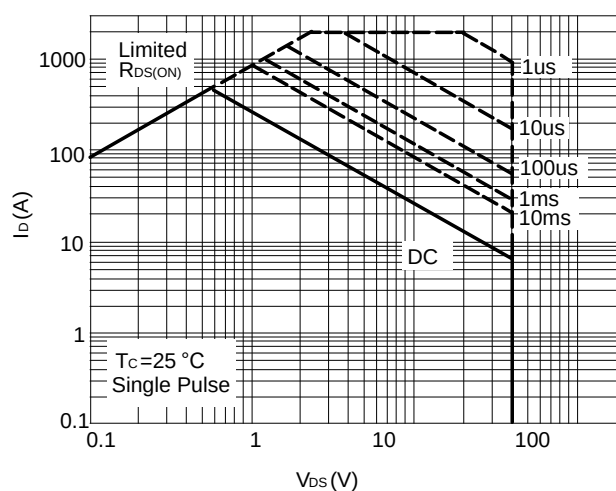
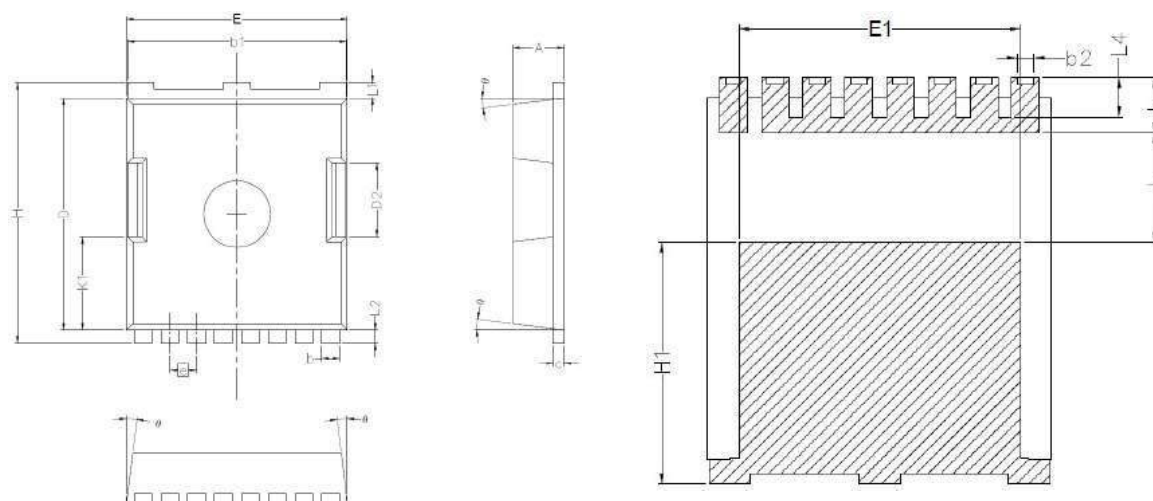


Figure 12: Maximum Safe Operating Area

■ 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°