

Features

- Uses MOT advanced double trench technology
- Low On-Resistance ($R_{DS(on)} \leq 2.4m\Omega$)
- Low Gate Charge
- Low Reverse transfer capacitances
- 100% avalanche tested
- Pb-free plating; RoHS compliant

Applications

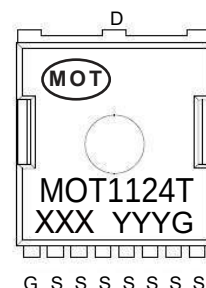
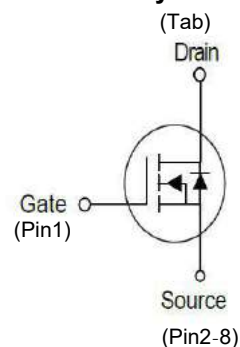
- Battery management
- Motor control and drive
- Synchronous rectification
- Switching applications

Pin configuration (Top view)



TOLL-8

Symbol



XXX=Lot Number
YYY=Year Week
G=Vth Range

Marking

Key Performance Parameters

Parameter	Value	Unit
V_{DS}	100	V
$R_{DS(on),typ.}$	2.2	mΩ
I_D	246	A

Ordering information

Type/Ordering Code	Package	Marking	Packing&Qty.(pcs)
MOT1124T	TOLL-8	MOT1124T	2000/Reel

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

Parameter		Symbol	Value	Unit
Drain-to-Source Voltage		V_{DS}	100	V
Gate-to-Source Voltage		V_{GS}	± 20	V
Continuous Drain Current	$T_C = 25^{\circ}\text{C}$	I_D	246	A
	$T_C = 100^{\circ}\text{C}$	I_D	156	A
Pulsed Drain Current		I_{DM}	984	A
Avalanche Energy		E_{AS}	1560	mJ
Power Dissipation	$T_C = 25^{\circ}\text{C}$	P_D	290	W
	$T_C = 100^{\circ}\text{C}$	P_D	116	W
Thermal Resistance, Junction-to-Case		$R_{\theta JC}$	0.43	$^{\circ}\text{C/W}$
Junction & Storage Temperature Range		T_J, T_{STG}	-55 to 150	$^{\circ}\text{C}$

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

Parameter	Symbol	Conditions	Min	Typ	Max	Unit
Static parameter						
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	$I_D = 250\mu\text{A}$, $V_{GS} = 0\text{V}$	100	-	-	V
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS}=100\text{V}$, $V_{GS} = 0\text{V}$	-	-	1.0	μA
		$T_J = 55^{\circ}$	-	-	5.0	μA
Gate-Body Leakage Current	I_{GSS}	$V_{DS} = 0\text{V}$, $V_{GS} = \pm 20\text{V}$	-	-	± 100	nA
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS} = V_{GS}$, $I_D = 250\mu\text{A}$	2.0	2.8	4.0	V
Static Drain-Source ON-Resistance	$R_{DS(ON)}$	$V_{GS} = 10\text{V}$, $I_D = 20\text{A}$	-	2.2	2.4	mΩ
Forward Transconductance	g_{FS}	$V_{DS} = 5\text{V}$, $I_D = 5\text{A}$	10	-	-	S
Diode Forward Voltage	V_{SD}	$I_S = 1\text{A}$, $V_{GS} = 0\text{V}$	-	0.66	1.0	V
Diode Continuous Current	I_S	$T_C = 25^{\circ}\text{C}$	-	-	246	A
Dynamic parameter						
Input Capacitance	C_{iss}	$V_{GS} = 0\text{V}$, $V_{DS} = 20\text{V}$, $f = 1\text{MHz}$	-	9100	-	pF
Output Capacitance	C_{oss}		-	2900	-	pF
Reverse Transfer Capacitance	C_{rss}		-	284	-	pF
Gate Resistance	R_g	$V_{GS} = 0\text{V}$, $V_{DS} = 0\text{V}$, $f = 1\text{MHz}$	-	0.7	-	Ω
Switching parameter						
Total Gate Charge (@ $V_{GS} = 10\text{V}$)	Q_g	$V_{GS} = 0$ to 10V $V_{DS} = 50\text{V}$, $I_D = 20\text{A}$	-	131	-	nC
Total Gate Charge (@ $V_{GS} = 6.0\text{V}$)	Q_g		-	83	-	nC
Gate Source Charge	Q_{gs}		-	46	-	nC
Gate Drain Charge	Q_{gd}		-	27	-	nC
Turn-On DelayTime	$t_{D(on)}$	$V_{GS} = 10\text{V}$, $V_{DS} = 50\text{V}$ $R_L = 2.5\Omega$, $R_{GEN} = 3\Omega$	-	33	-	ns
Turn-On Rise Time	t_r		-	33	-	ns
Turn-Off DelayTime	$t_{D(off)}$		-	63	-	ns
Turn-Off Fall Time	t_f		-	23	-	ns
Body Diode Reverse Recovery Time	t_{rr}	$I_F = 20\text{A}$, $dI_F/dt = 100\text{A}/\mu\text{s}$	-	91	-	ns
Body Diode Reverse Recovery Charge	Q_{rr}		-	250	-	nC

■ TYPICAL CHARACTERISTICS

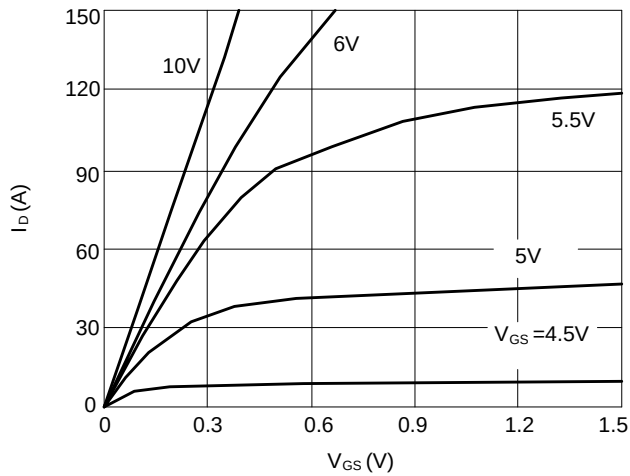


Figure 1: Saturation characteristics

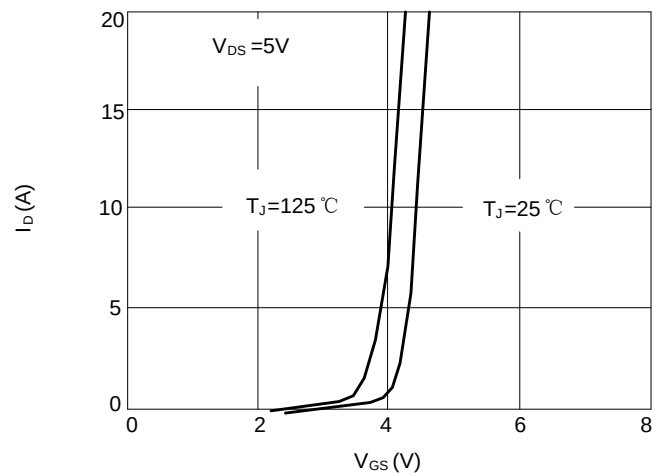


Figure 1: Saturation characteristics

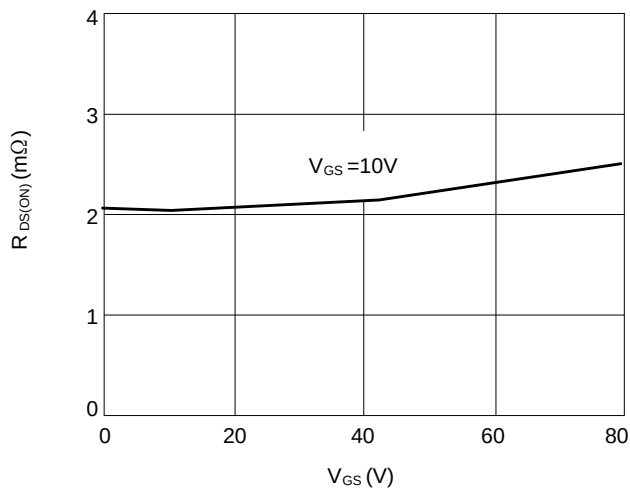


Figure 3: $R_{DS(ON)}$ vs. drain current

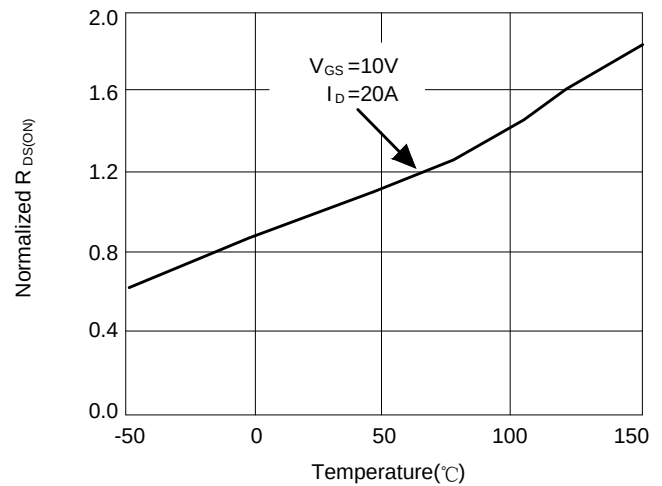


Figure 4: $R_{DS(ON)}$ vs. junction temperature

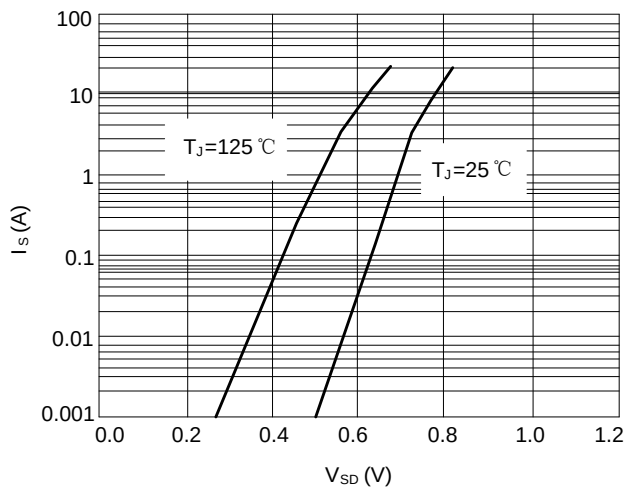


Figure 5: Body diode characteristics

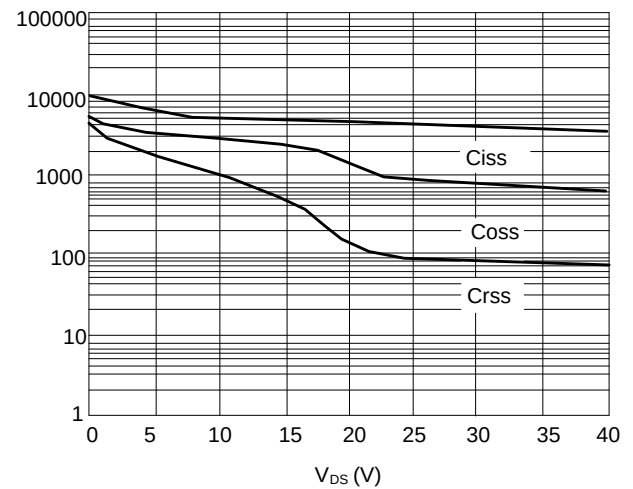


Figure 6: Capacitance characteristics

■ TYPICAL CHARACTERISTICS(Cont.)

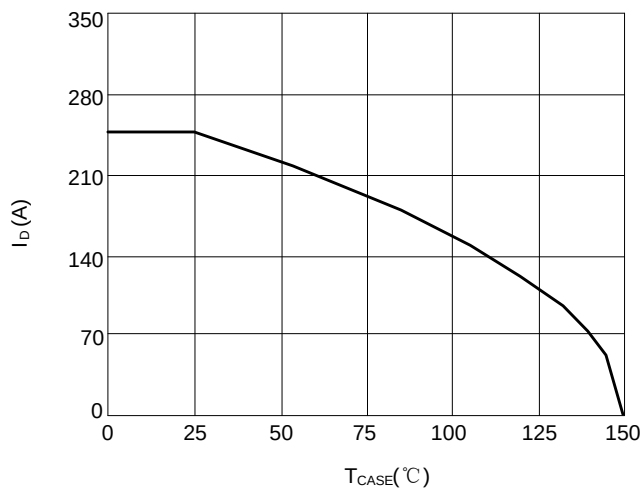


Figure 7: Current de-rating

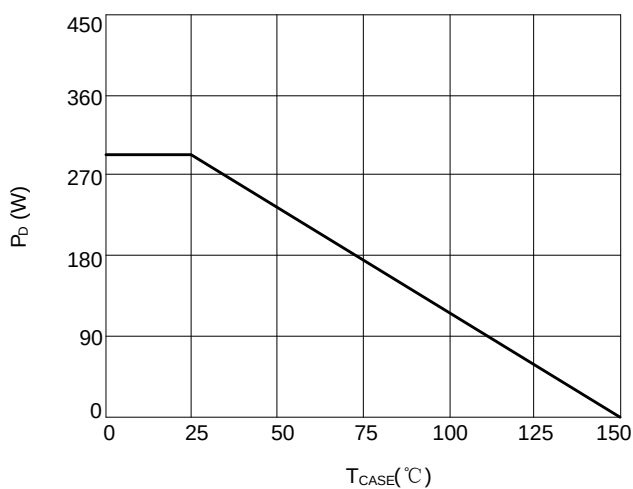


Figure 8: Power de-rating

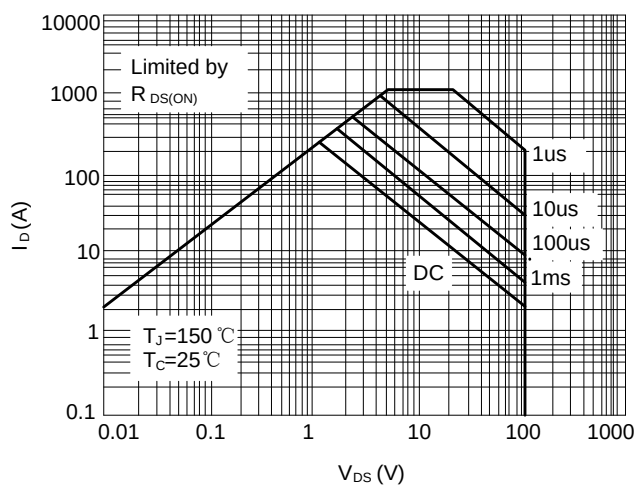


Figure 9: Maximum safe operating area

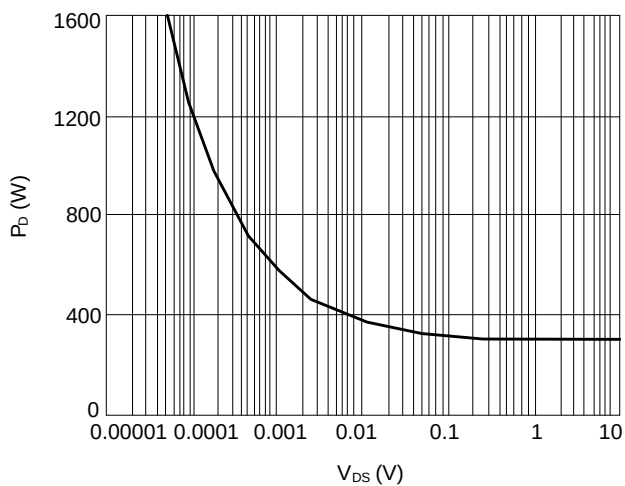
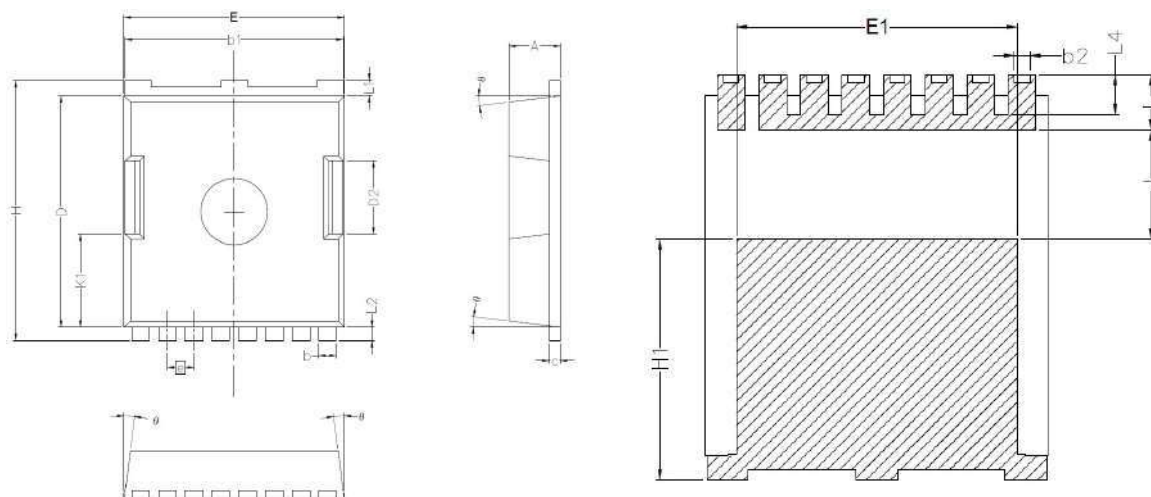


Figure 10: Single pulse power rating junction-Case

■TOLL-8L 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°

- The information contained herein is subject to change without notice.
- GUANGDONG INMARK ELECTRONICS CO. LTD(MOT) exerts the greatest possible effort to ensure high quality and reliability. Nevertheless, semiconductor devices in general can malfunction or fail due to their inherent electrical sensitivity and vulnerability to physical stress. It is the responsibility of the buyer, when utilizing MOT products, to comply with the standards of safety in making a safe design for the entire system, including redundancy, fire-prevention measures, and malfunction prevention, to prevent any accidents, fires, or community damage that may ensue. In developing your designs, please ensure that MOT products are used within specified operating ranges as set forth in the most recent MOT products specifications.
- The MOT products listed in this document are intended for usage in general electronics applications (computer, personal equipment, office equipment, measuring equipment, industrial robotics, domestic appliances, etc.). These MOT products are neither intended nor warranted for usage in equipment that requires extraordinarily high quality and/or reliability or a malfunction or failure of which may cause loss of human life or bodily injury ("Unintended Usage"). Unintended Usage include atomic energy control instruments, airplane or spaceship instruments, transportation instruments, traffic signal instruments, combustion control instruments, medical instruments, all types of safety devices, etc.. Unintended Usage of MOT products listed in this document shall be made at the customer's own risk.
- Thank you for your interest in Renmao Electronics. If you need any business inquiries, please contact us.
- Shenzhen Headquarters:
19th Floor, Shencheng Investment Center Building, Guiyuan Street, Luohu District, Shenzhen
E-mail:sales@mot-mos.com

Shenzhen Base:
Renmao Industrial Park, No. 2 Songgang Avenue, Bao'an District, Shenzhen

Jiangsu base:
Hongshi Intelligent Industrial Park, No. 33, the Taihu Lake Road, Tinghu District, Yancheng City

Taipei Design Center:
10th Floor, No. 107, Section 1, Chengde Road, Taipei

Nanjing Design Center:
Block B, Tianyu Xi'an Garden, No. 688 Longmian Avenue, Jiangning District