

■ PRODUCT CHARACTERISTICS

VDSS	120V
$R_{DS(on)}$ Typ($V_{GS} @ = 10\text{ V}$)	2.0mΩ
ID	260A

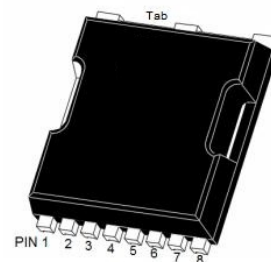
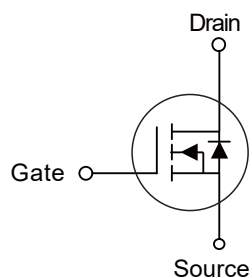
■ FEATURES

Surface-mounted package Advanced
terch cell design Super trench

■ APPLICATIONS

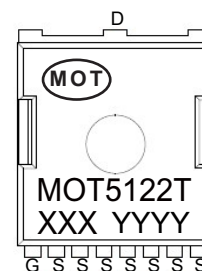
High power system inverter
Light electric vehicles
BMS
Drones

■ SYMBOL



TOLL-8L

Pin configuration (Top view)



XXX = Lot Number
YYYY = Year Week

Marking

Order information

Device	Package	Shipping
MOT5122T/TR	TOLL-8L	4000/Tape&Reel

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

Parameter	Symbol	Conditions	Min	Max	Unit
Drain-Source Voltage	V_{DS}	$T_C = 25^\circ\text{C}$	120	-	V
Gate-Source Voltage	V_{GS}	$T_C = 25^\circ\text{C}$	-	± 20	V
Drain Current (DC) *	I_D	$T_C = 25^\circ\text{C}, V_{GS} = 10\text{ V}$	-	260	A
		$T_C = 100^\circ\text{C}, V_{GS} = 10\text{ V}$	-	185	A
Drain Current (Pulsed) ***	I_{DM}	$T_C = 25^\circ\text{C}, V_{GS} = 10\text{ V}$	-	1040	A
Drain power dissipation	P_{tot}	$T_C = 25^\circ\text{C}$	-	300	W
Storage Temperature	T_{stg}		-55	175	$^\circ\text{C}$
Junction Temperature	T_J		-	175	$^\circ\text{C}$
Continuous-Source Current	I_S	$T_C = 25^\circ\text{C}$	-	260	A
Single Pulsed Avalanche Energy	E_{AS}	$V_{DD} = 50\text{ V}, L = 1.0\text{ mH}$	-	2450	mJ
Thermal Resistance- Junction to Ambient**	$R_{\theta JA}$		-	45	$^\circ\text{C/W}$
Thermal Resistance- Junction to Case**	$R_{\theta JC}$		-	0.4	

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

Parameter	Symbol	Conditions	Min	Typ	Max	Unit
Static Characteristics						
Drain-Source Breakdown Voltage	BV _{DSS}	V _{GS} = 0 V, I _{DS} = 250 μA	120	-	-	V
Gate Threshold Voltage	V _{GS(th)}	V _{DS} = V _{GS} , I _{DS} = 250 μA	2	-	4	V
Drain Leakage Current	I _{DSS}	V _{DS} = 96 V, V _{GS} = 0 V	-	-	1	μA
Gate Leakage Current	I _{GSS}	V _{GS} = 0 V, V _{GS} = ± 20 V	-	-	±100	nA
On-State Resistance ^a	R _{DS(ON)}	V _{GS} = 10 V, I _{DS} = 50A	-	2.0	2.6	mΩ
		V _{GS} = 6 V, I _{DS} = 30A	-	2.7	3.2	
Diode Characteristics						
Diode Forward Voltage ^a	V _{SD}	I _{SD} = 50A, V _{GS} = 0 V	-	-	1.3	V
Reverse Recovery Time	t _{rr}	I _{DS} = 50A, V _{GS} = 0 V dI _{SD} /dt = 100 A/μs	-	137	-	nS
Reverse Recovery Charge	Q _{rr}		-	474	-	nC
Dynamic Characteristics						
Input Capacitance	C _{iss}	V _{GS} = 0 V, V _{DS} = 60 V Frequency = 1 MHz	-	11834	-	pF
Output Capacitance	C _{oss}		-	1350	-	
Reverse Transfer Capacitance ^b	C _{rss}		-	78	-	
Turn-on Delay Time	t _d (on)	V _{DS} = 60 V, V _{GEN} = 10 V, R _G = 3.9 Ω, R _L = 1.2 Ω, I _{DS} = 50A	-	30	-	nS
Turn-on Rise	t _r		-	102	-	
Turn-off Delay Time	t _d (off)		-	143	-	
Turn-off Fall Time	t _f		-	101	-	
Gate Charge Characteristics ^b						
Total Gate Charge	Q _g	V _{DS} = 60 V, V _{GS} = 10 V, I _{DS} = 50A	-	213	-	nC
Gate-Source Charge	Q _{gs}		-	62	-	
Gate-Drain Charge	Q _{gd}		-	54	-	

Notes :

* Pulse width $\leq 300\text{ }\mu\text{s}$, duty cycle $\leq 2\%$

** Surface Mounted on minimum footprint pad area.

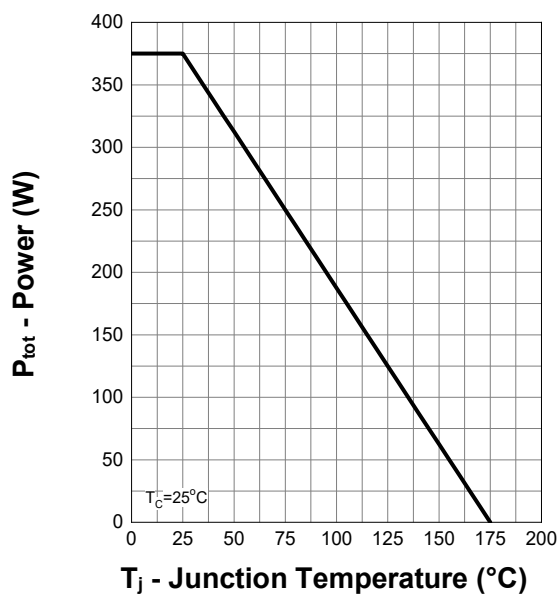
*** Limited by bonding wire

a : Pulse test ; pulse width $\leq 300\text{ }\mu\text{s}$, duty cycle $\leq 2\%$

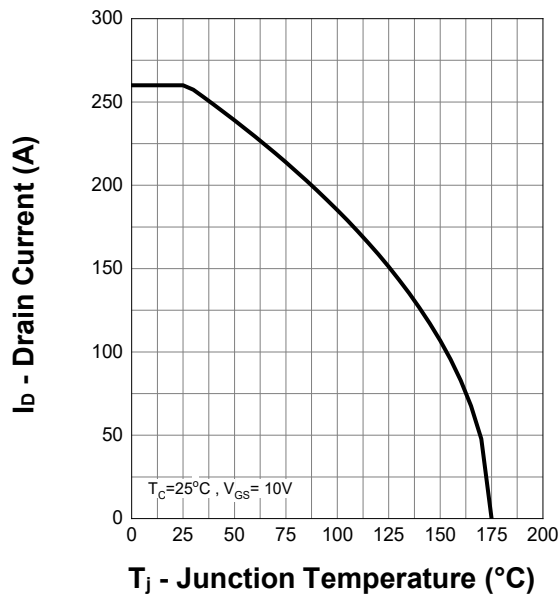
b : Guaranteed by design, not subject to production testing

■ TYPICAL CHARACTERISTICS

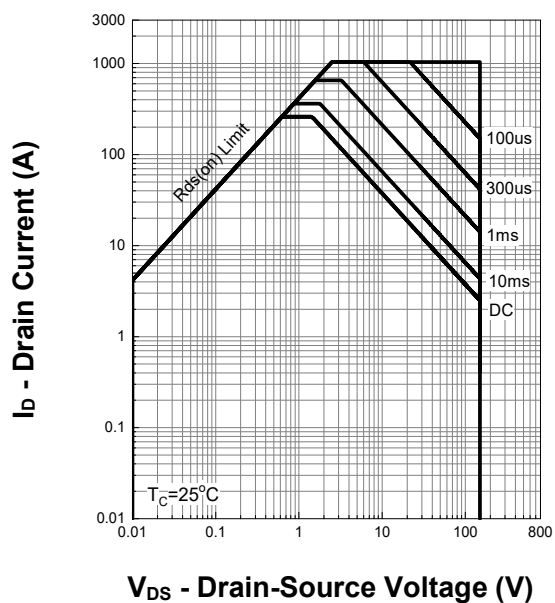
Power Capability



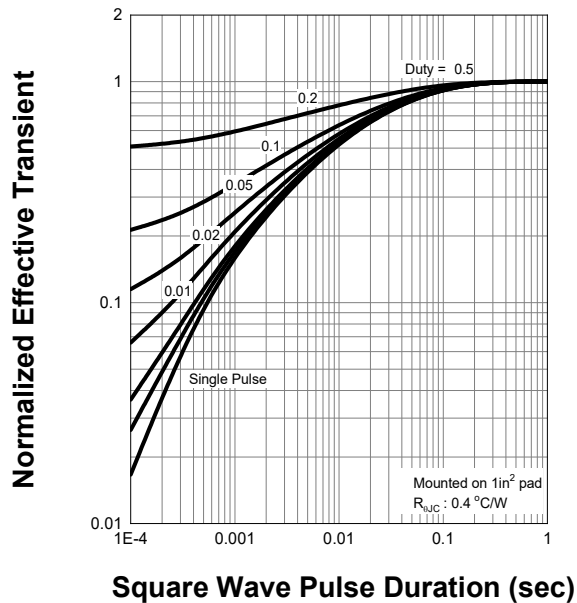
Current Capability



Safe Operating Area

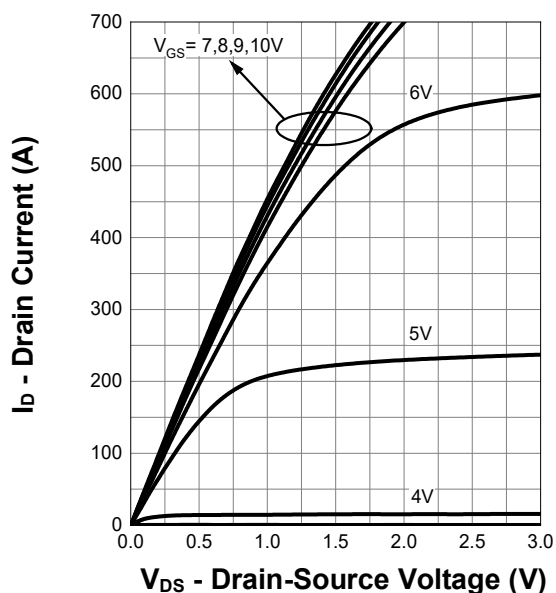


Transient Thermal Impedance

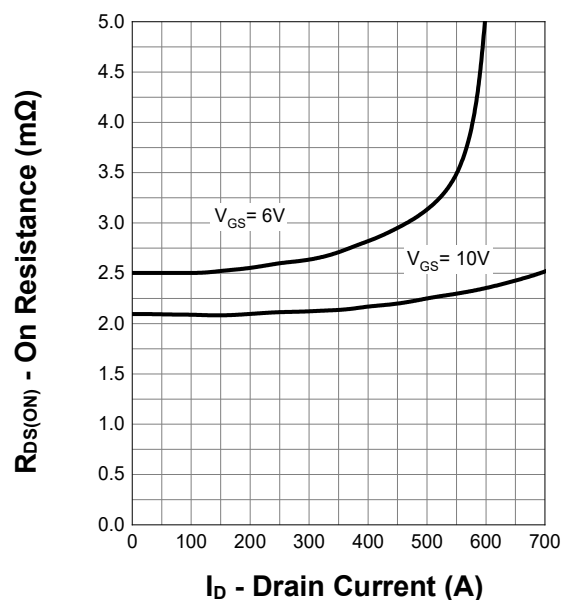


■ TYPICAL CHARACTERISTICS(Cont.)

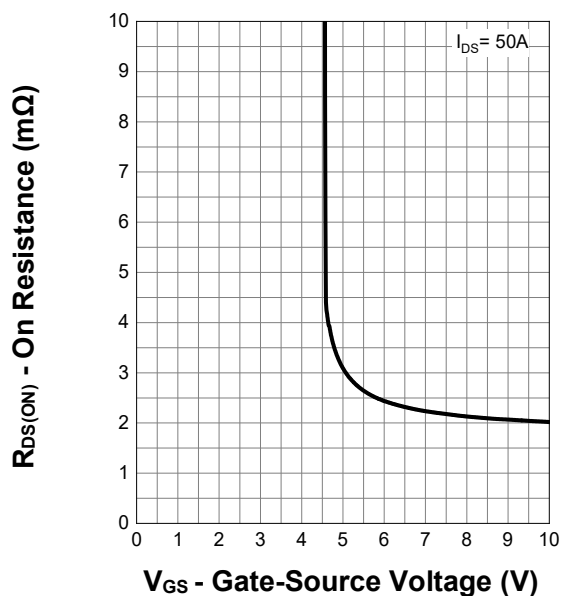
Output Characteristics



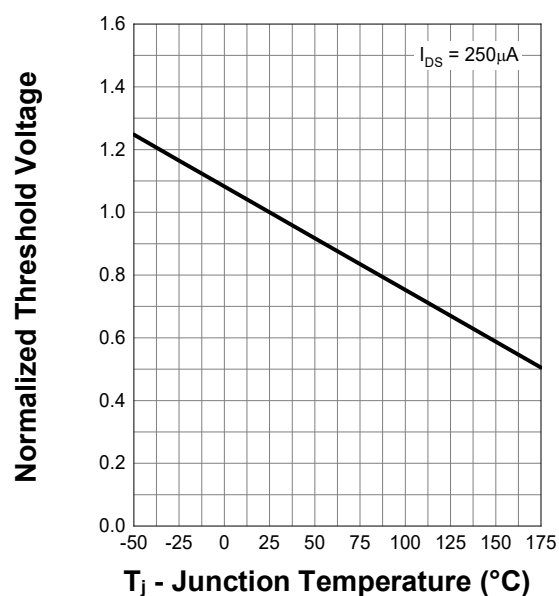
On Resistance



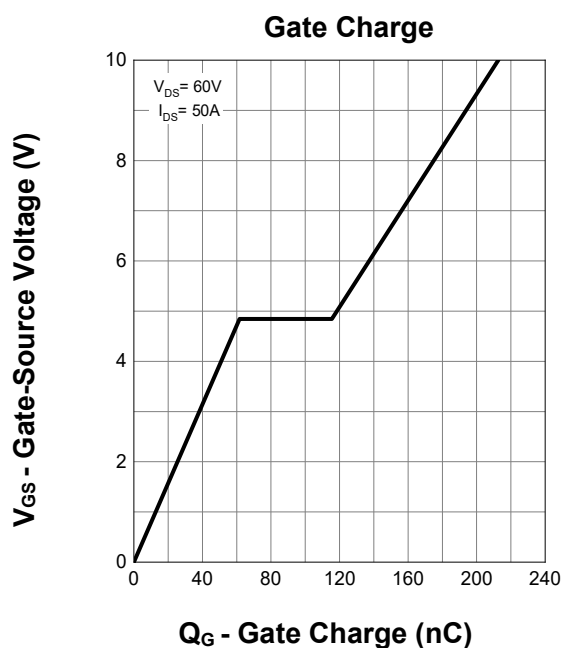
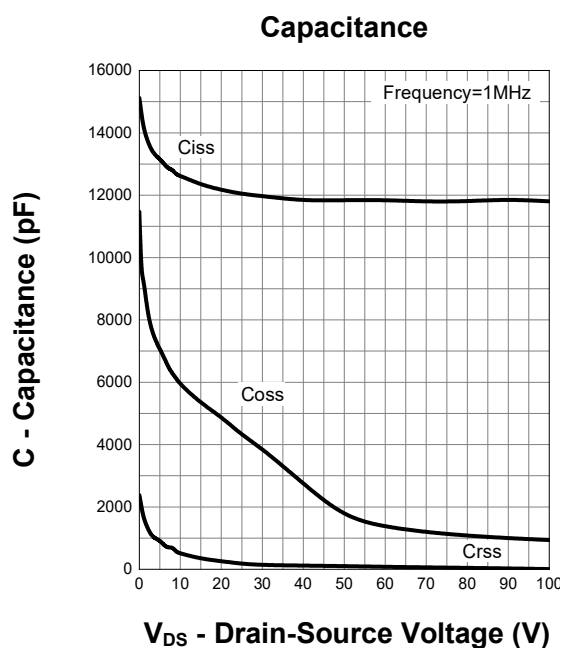
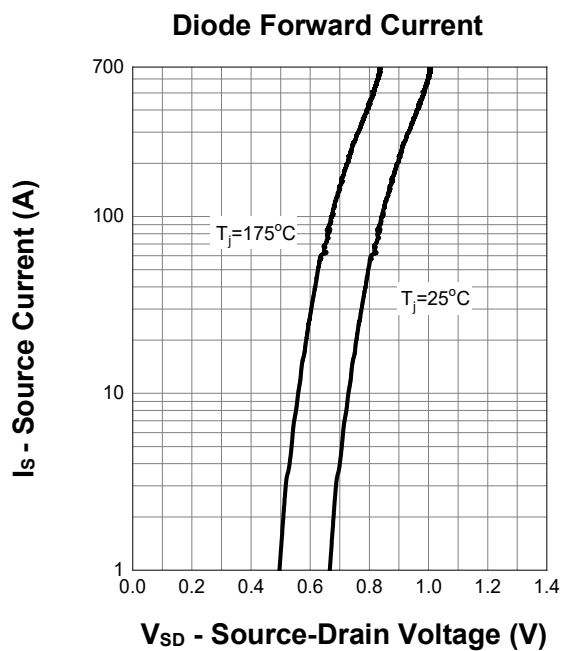
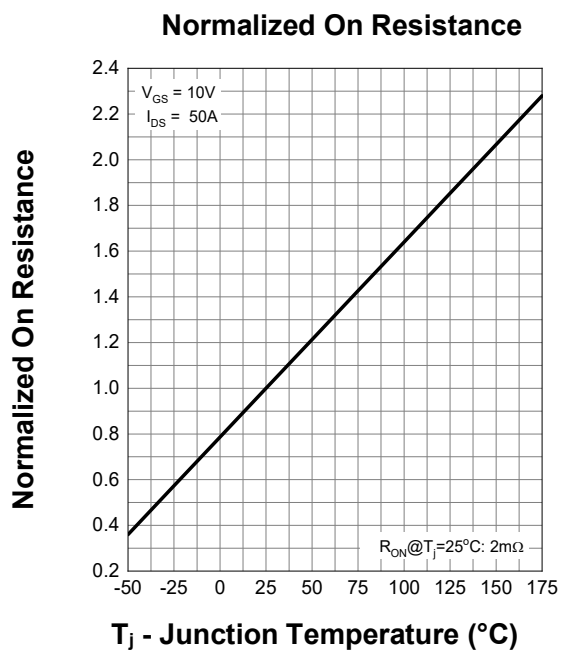
Transfer Characteristics



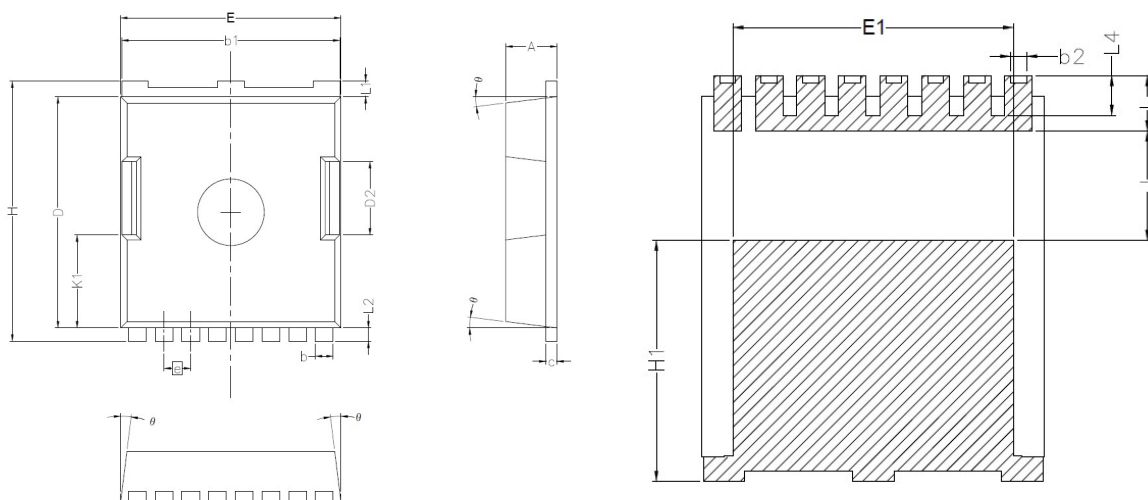
Normalized Threshold Voltage



■ TYPICAL CHARACTERISTICS(Cont.)



■ 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°

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