

# TLTS1515TE/TK-X

## N-Channel Enhancement Mode Power MOSFET

- Features**

$V_{DS} = 150V$ ,

$I_D = 121A$

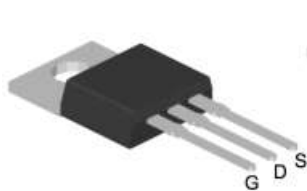
$R_{DS(ON)} @ V_{GS} = 10V$ , TYP 5.4 mΩ (TO220)

$R_{DS(ON)} @ V_{GS} = 10V$ , TYP 5.1 mΩ (TO263)

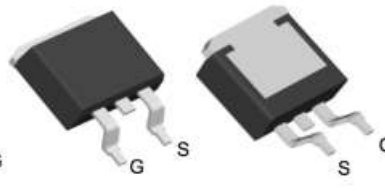
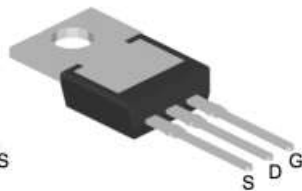
- General Description**

- DC Motor Driver
- Synchronous Rectification in DC/DC and AC/DC

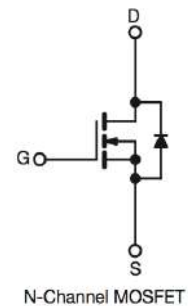
- Pin Configurations**



**TO220-3L  
TLTS1515TE-X**



**TO263-2L  
TLTS1515TK-X**



- Absolute Maximum Ratings @  $T_A=25^\circ C$  unless otherwise noted**

Parameter	Symbol	Ratings	Unit
Drain-Source Voltage	$V_{DSS}$	150	V
Gate-Source Voltage	$V_{GSS}$	$\pm 20$	V
Drain Current (Continuous) *C	$I_D$	$T_C=25^\circ C$	121
		$T_C=70^\circ C$	67
Drain Current (Pulse) *B	$I_{DM}$	484	A
Power Dissipation	$P_D$	215.5	W
Operating Temperature/ Storage Temperature	$T_J/T_{STG}$	-55~150	$^\circ C$

- Thermal Resistance Ratings**

Parameter	Symbol	Maximum	Unit
Maximum Junction-to-Ambient *A	$R_{thJA}$	62.5	$^\circ C/W$
Maximum Junction-to-Case (Drain)	$R_{thJC}$	0.58	

## TLTS1515TE/TK-X

● **Electrical Characteristics** @ $T_A=25^\circ\text{C}$  unless otherwise noted

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
<b>Static*D</b>						
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	$V_{GS} = 0V, I_D = 250\mu A$	150	--	--	V
Zero Gate Voltage Drain Current	$I_{DSS}$	$V_{DS} = 120V, V_{GS} = 0V$	--	--	1	$\mu A$
Gate Threshold Voltage	$V_{GS(TH)}$	$V_{GS} = V_{DS}, I_{DS} = 250\mu A$	2	--	4	V
Gate Leakage Current	$I_{GSS}$	$V_{GS} = \pm 20V, V_{DS} = 0V$	--	--	$\pm 100$	nA
Drain-Source On-state Resistance	$R_{DS(on)}$	$V_{GS} = 10V, I_D = 20A$ (TO220)	--	5.4	7	m $\Omega$
	$R_{DS(on)}$	$V_{GS} = 10V, I_D = 20A$ (TO236)	--	5.1	6.6	m $\Omega$
Diode Forward Voltage	$V_{SD}$	$I_{SD} = 1A, V_{GS} = 0V$	--	--	1.2	V
Diode Forward Current *C	$I_S$	$T_C = 25^\circ\text{C}$	--	--	121	A
<b>Switching</b>						
Total Gate Charge	$Q_g$	$V_{DS} = 75V, I_D = 50A,$ $V_{GS} = 10V$	--	163	--	nC
Gate-Source Charge	$Q_{gs}$		--	50	--	nC
Gate-Drain Charge	$Q_{gd}$		--	39	--	nC
Turn-on Delay Time	$t_{d(on)}$	$V_{DS} = 75V, V_{GEN} = 10V,$ $R_G = 3.9\Omega, R_L = 1.5\Omega,$ $I_{DS} = 50A$	--	25	--	ns
Turn-on Rise Time	$t_r$		--	77	--	ns
Turn-off Delay Time	$t_{d(off)}$		--	112	--	ns
Turn-off Fall Time	$t_f$		--	79	--	ns
<b>Dynamic</b>						
Input Capacitance	$C_{iss}$	$V_{GS} = 0V, V_{DS} = 75V,$ $f = 1\text{MHz}$	--	9375	--	pF
Output Capacitance	$C_{oss}$		--	565	--	pF
Reverse Transfer Capacitance	$C_{rss}$		--	50	--	pF

A: The value of  $R_{thJA}$  is measured with the device mounted on 1in2 FR-4 board with 2oz. Copper, in a still air environment with  $T_A=25^\circ\text{C}$ . The value in any given application depends on the user's specific board design.

B: Repetitive rating, pulse width limited by junction temperature.

C: The current rating is based on the  $t \leq 10\text{s}$  junction to ambient thermal resistance rating.

D: Pulse Test: Pulse Width  $\leq 300\mu\text{s}$ , Duty Cycle  $\leq 2\%$ .

## TLTS1515TE/TK-X

- Typical Performance Characteristics ( $T_J = 25^\circ\text{C}$ , unless otherwise noted)

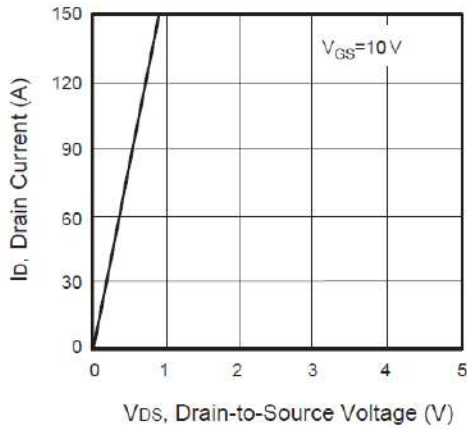


Figure 1. Output Characteristics

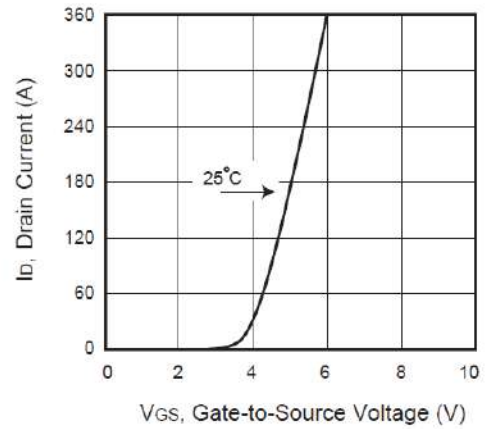


Figure 2. Transfer Characteristics

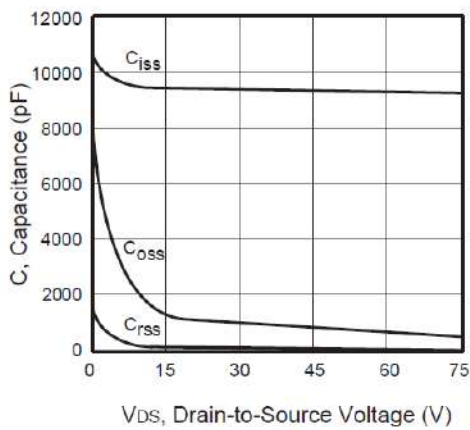


Figure 3. Capacitance

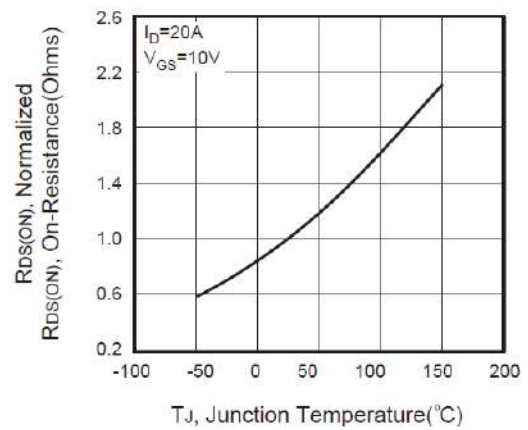


Figure 4. On-Resistance Variation with Temperature

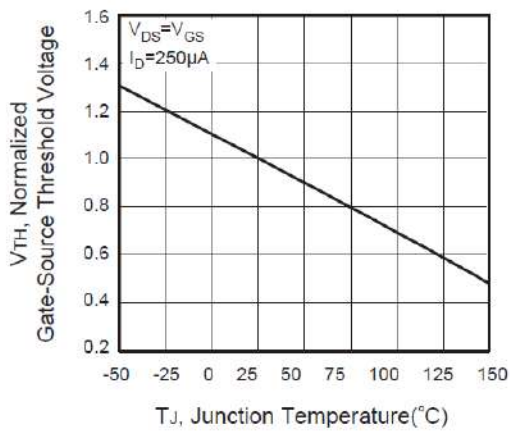


Figure 5. Gate Threshold Variation with Temperature

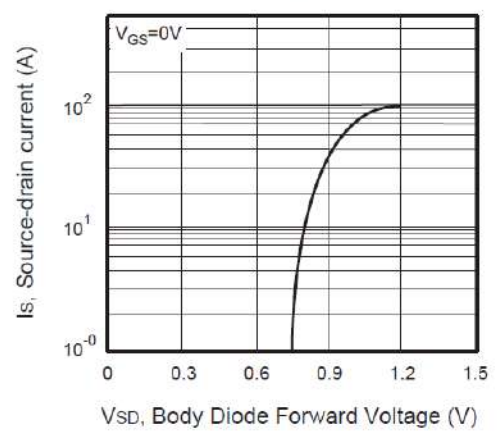


Figure 6. Body Diode Forward Voltage Variation with Source Current

# TLTS1515TE/TK-X

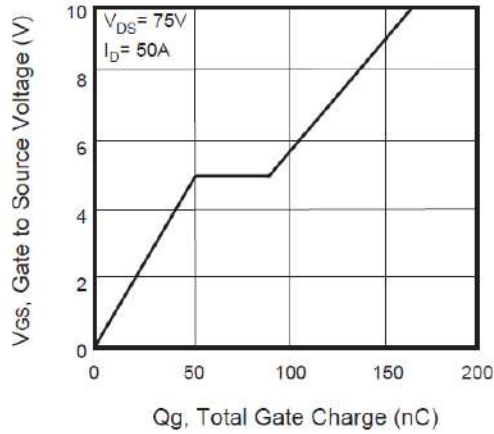


Figure 7. Gate Charge

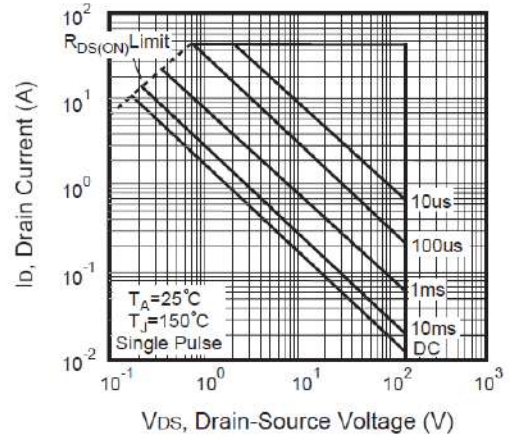


Figure 8. Maximum Safe Operating Area

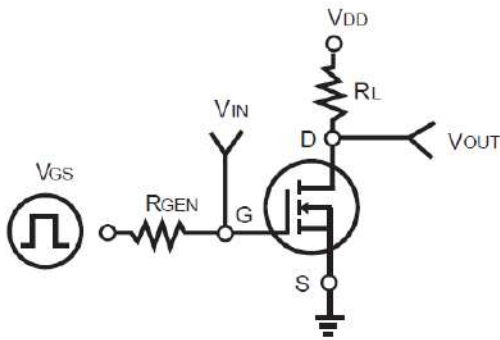


Figure 9. Switching Test Circuit

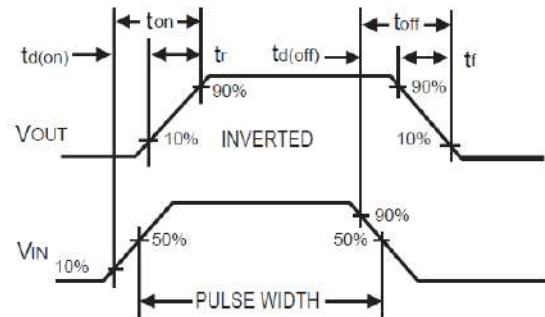


Figure 10. Switching Waveforms

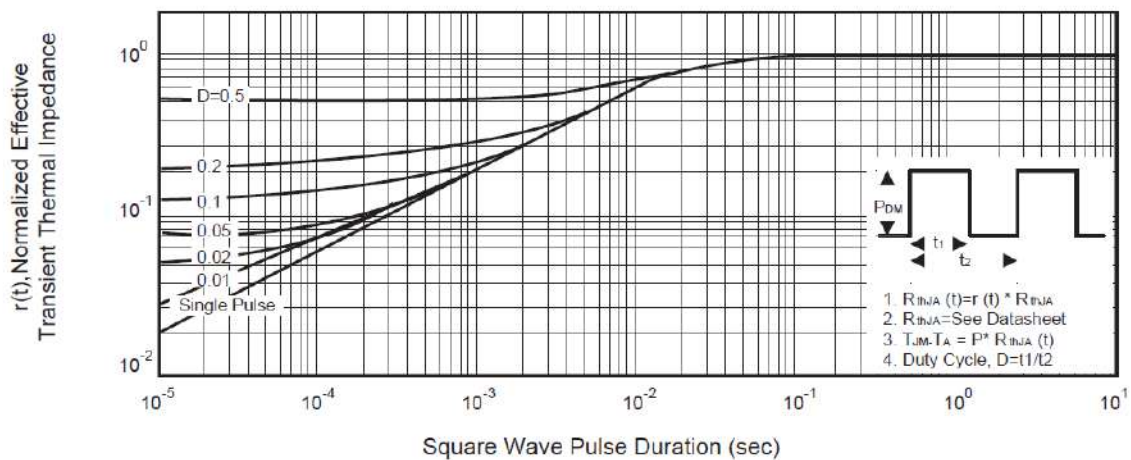
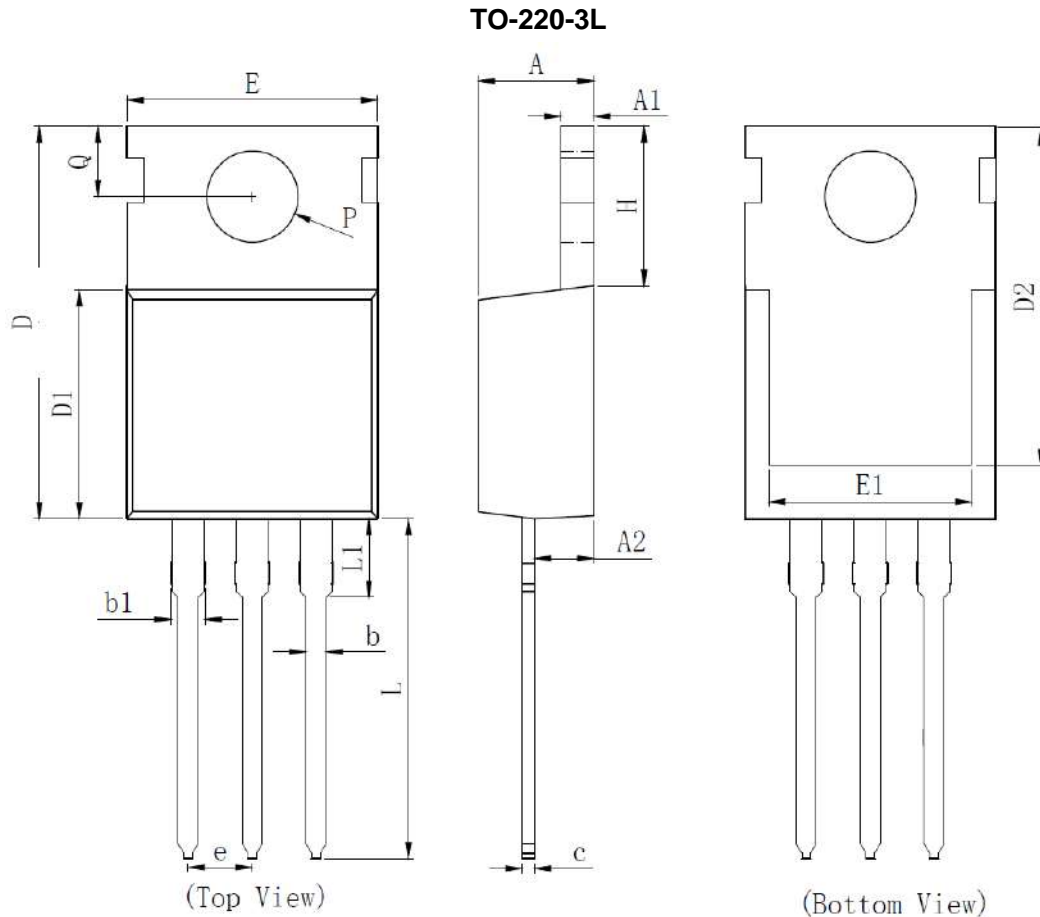


Figure 11. Normalized Thermal Transient Impedance Curve

## TLTS1515TE/TK-X

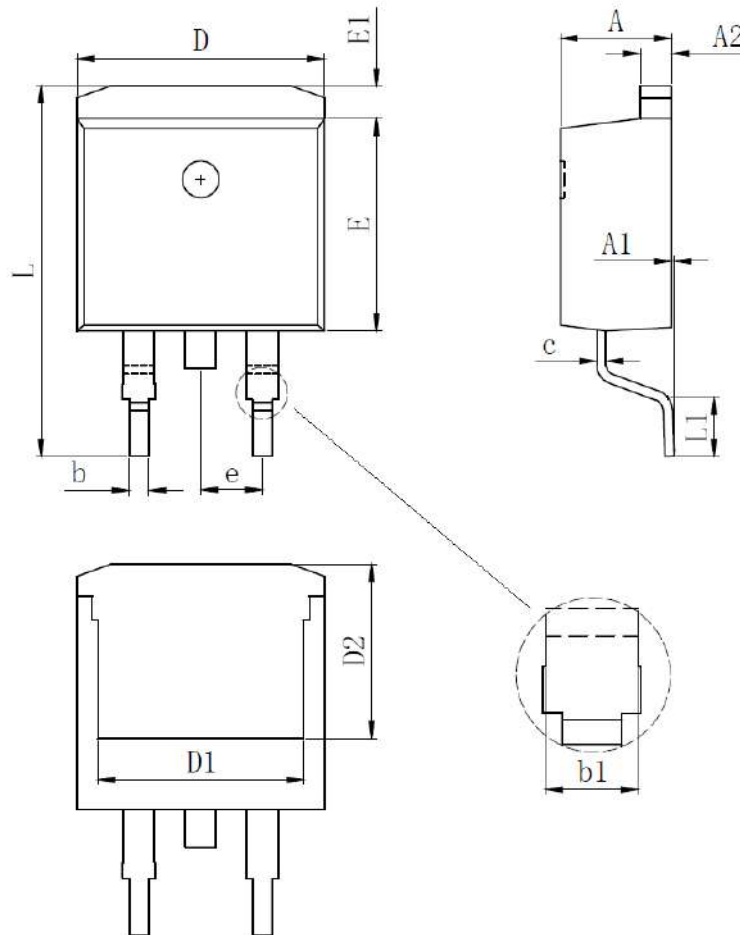
- Package Information



DIM	MILLIMETERS		
	MIN.	NOM.	MAX.
A	4.3	—	4.8
A1	1.15	—	1.45
A2	2.1	—	2.9
b	0.6	—	1
b1	1.1	—	1.5
c	0.3	—	0.7
D	14.5	—	16.8
D1	8.5	—	9.7
D2	11	—	14
e	2.54		
E	9.6	—	10.6
E1	6.2	—	9
H	6.1	—	6.8
L	11	—	15
L1	2	—	4
Q	2.5	—	3
P	3.4	—	4

# TLTS1515TE/TK-X

TO-263-2L



DIM	MILLIMETERS		
	MIN.	NOM.	MAX.
A	4.05	--	4.85
A1	0	--	0.254
A2	1.1	--	1.7
b	0.5	--	1
b1	1.1	--	1.8
c	0.3	--	0.75
D	9.6	--	10.7
D1	6.2	--	8.8
D2	6.2	--	8.4
E	8.2	--	9.7
E1	1	--	1.7
e	2.44	2.54	2.64
L	14.5	--	16.5
L1	1.5	--	2.8