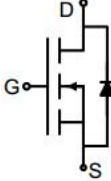
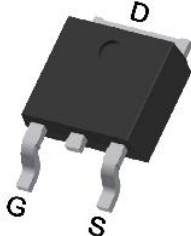


N-Channel Enhancement Mode Power MOSFET

<p>Description</p> <p>The GT650N15K uses advanced trench technology to provide excellent $R_{DS(ON)}$, low gate charge. It can be used in a wide variety of applications.</p> <p>General Features</p> <ul style="list-style-type: none"> ● V_{DS} 150V ● I_D (at $V_{GS} = 10V$) 20A ● $R_{DS(ON)}$ (at $V_{GS} = 10V$) < 65mΩ ● 100% Avalanche Tested ● RoHS Compliant <p>Application</p> <ul style="list-style-type: none"> ● Synchronous Rectification in SMPS or LED Driver ● UPS ● Motor Control ● BMS ● High Frequency Circuit 		 <p>Schematic Diagram</p>  <p>TO-252</p>	
Device	Package	Marking	Packaging
GT650N15K	TO-252	GT650N15	2500pcs/Reel

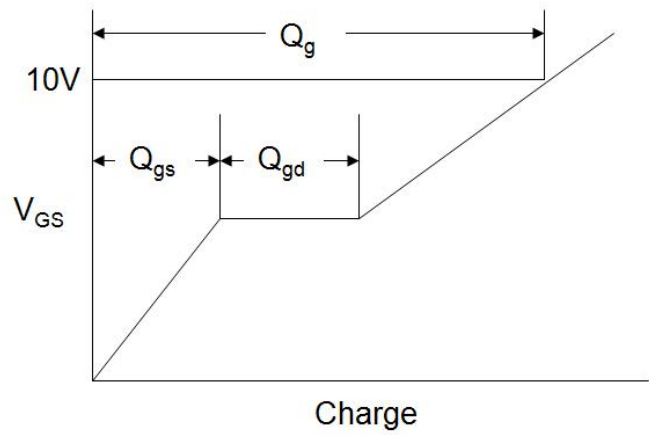
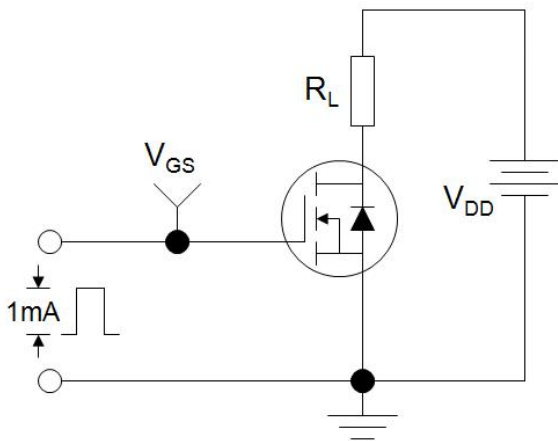
Absolute Maximum Ratings $T_C = 25^\circ C$, unless otherwise noted			
Parameter	Symbol	Value	Unit
Drain-Source Voltage	V_{DS}	150	V
Continuous Drain Current	I_D	20	A
Pulsed Drain Current (note1)	I_{DM}	80	A
Gate-Source Voltage	V_{GS}	± 20	V
Power Dissipation	P_D	68	W
Single pulse avalanche energy (note2)	E_{AS}	65	mJ
Operating Junction and Storage Temperature Range	T_J, T_{stg}	-55 To 175	$^\circ C$
Thermal Resistance			
Parameter	Symbol	Value	Unit
Thermal Resistance, Junction-to-Case (note3)	R_{thJC}	2.2	$^\circ C/W$

Specifications $T_J = 25^\circ\text{C}$, unless otherwise noted						
Parameter	Symbol	Test Conditions	Value			Unit
			Min.	Typ.	Max.	
Static Parameters						
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	$V_{GS} = 0V, I_D = 250\mu A$	150	--	--	V
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS} = 100V, V_{GS} = 0V$	--	--	1	μA
Gate-Source Leakage	I_{GSS}	$V_{GS} = \pm 20V$	--	--	± 100	nA
Gate-Source Threshold Voltage	$V_{GS(th)}$	$V_{DS} = V_{GS}, I_D = 250\mu A$	2.5	3.3	4.5	V
Drain-Source On-Resistance	$R_{DS(on)}$	$V_{GS} = 10V, I_D = 10A$	--	59	65	m Ω
Forward Transconductance	g_{FS}	$V_{DS}=5V, I_D=10A$	15	--	--	S
Dynamic Parameters						
Input Capacitance	C_{iss}	$V_{GS} = 0V,$ $V_{DS} = 75V,$ $f = 1.0MHz$	--	600	--	pF
Output Capacitance	C_{oss}		--	74.7	--	
Reverse Transfer Capacitance	C_{rss}		--	10.8	--	
Total Gate Charge	Q_g	$V_{DS} = 75V,$ $I_D = 10A,$ $V_{GS} = 10V$	--	12	--	nC
Gate-Source Charge	Q_{gs}		--	5.7	--	
Gate-Drain Charge	Q_{gd}		--	2.7	--	
Turn-on Delay Time	$t_{d(on)}$	$V_{DD}=75V, R_L=7.5\Omega$ $V_{GS}=10V, R_G=3\Omega$	--	9.5	--	ns
Turn-on Rise Time	t_r		--	5.5	--	
Turn-off Delay Time	$t_{d(off)}$		--	12.5	--	
Turn-off Fall Time	t_f		--	3	--	
Drain-Source Body Diode Characteristics						
Continuous Body Diode Current	I_S	$T_C = 25^\circ\text{C}$	--	--	20	A
Body Diode Voltage	V_{SD}	$T_J = 25^\circ\text{C}, I_{SD} = 10A, V_{GS} = 0V$	--	--	1.2	V
Reverse Recovery Time	trr	$IF=IS, di/dt=100A/\mu s$	--	29	--	ns
Reverse Recovery Charge	Qrr		--	130	--	nC

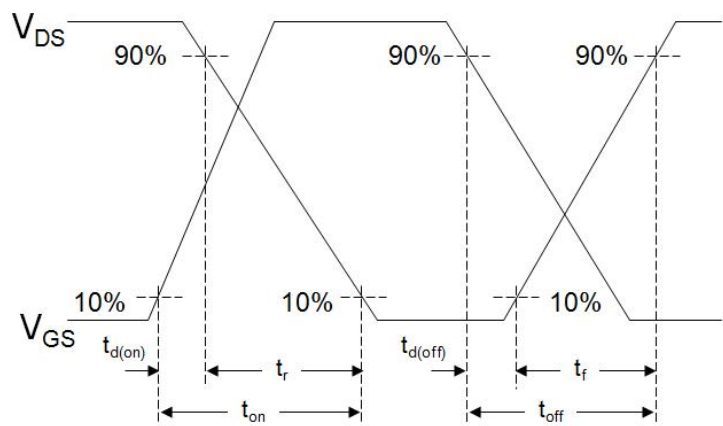
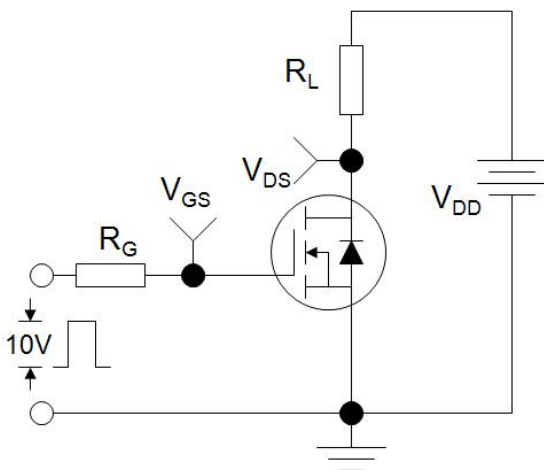
Notes

1. Repetitive Rating: Pulse width limited by maximum junction temperature
2. EAS condition : $T_J=25^\circ\text{C}$, $V_{DD}=50V, V_{GS}=10V, L=0.5mH, R_g=25\Omega$
3. Surface Mounted on FR4 Board, $t \leq 10$ sec

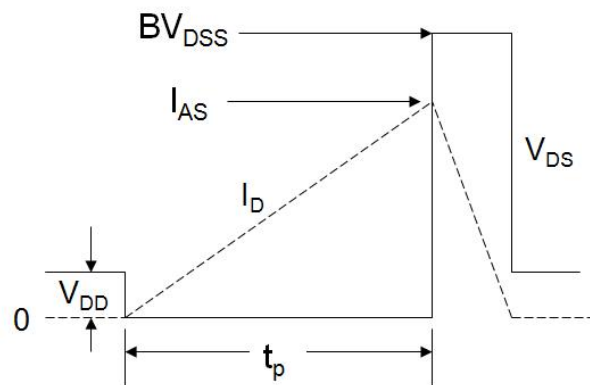
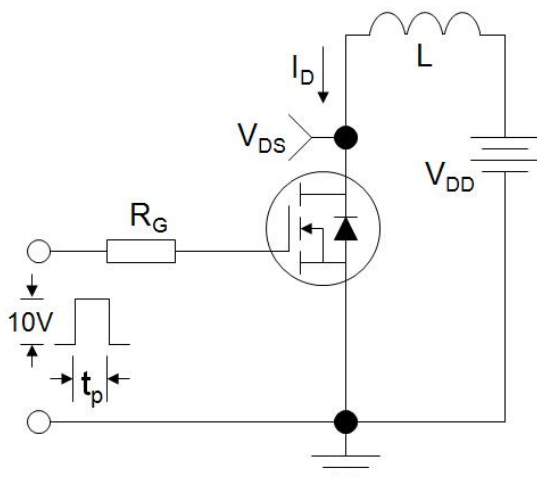
Gate Charge Test Circuit



Switch Time Test Circuit



EAS Test Circuit



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

Figure 1. Output Characteristics

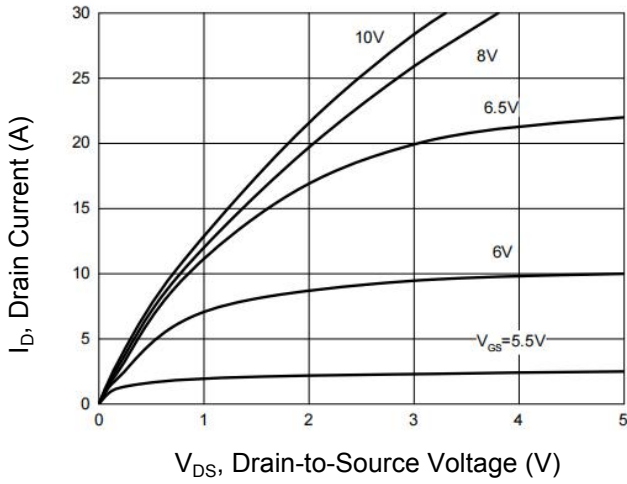


Figure 2. Transfer Characteristics

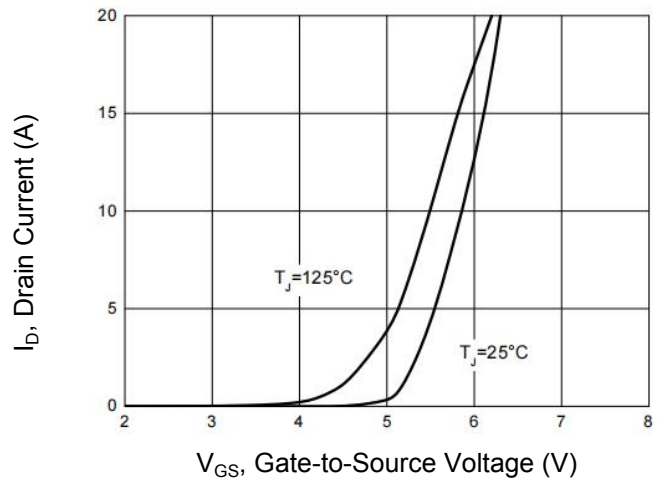


Figure 3. Gate Charge

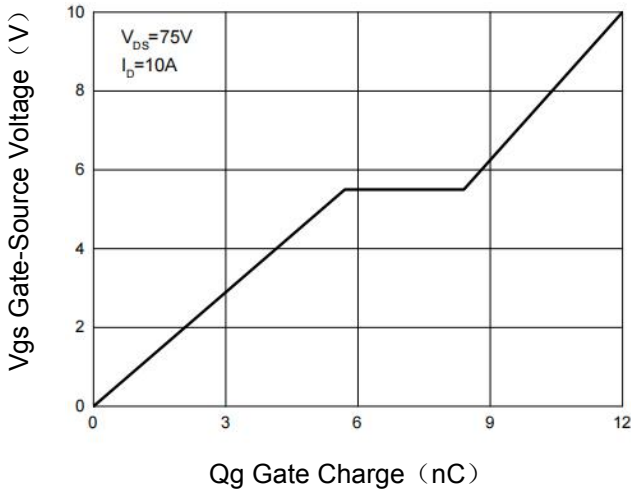


Figure 4. Drain Source On Resistance

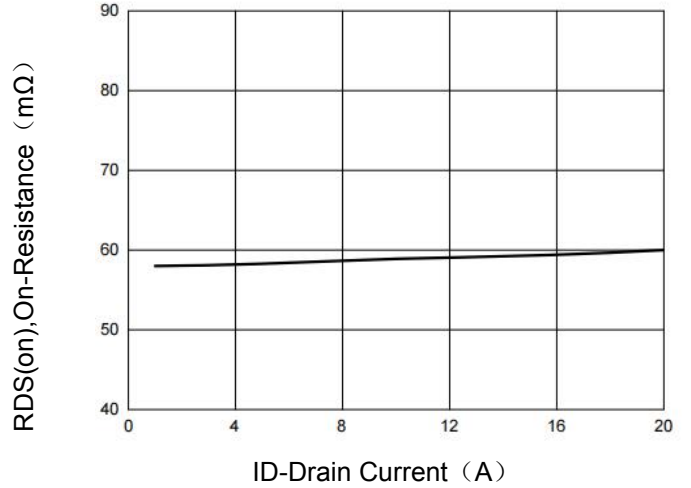
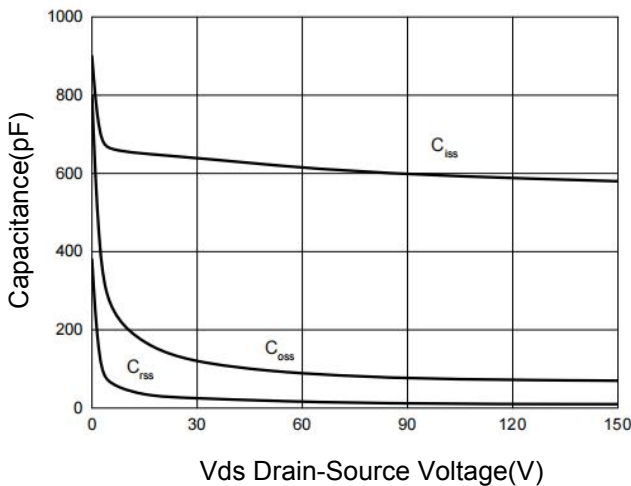


Figure 5. Capacitance vs Vds



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

Figure 6. Normalized On Resistance Characteristics

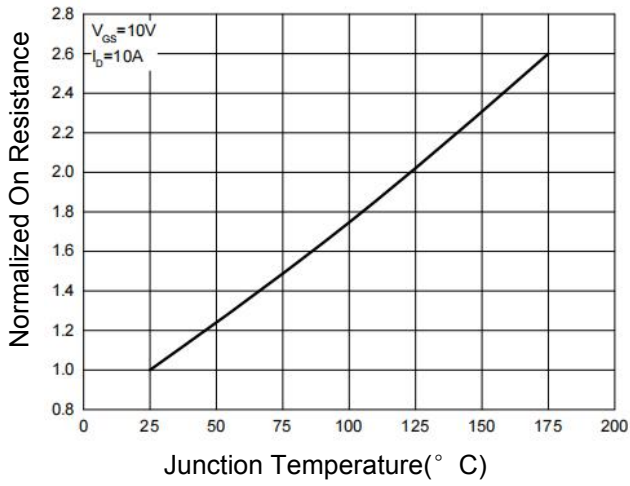


Figure 7. Safe Operation Area

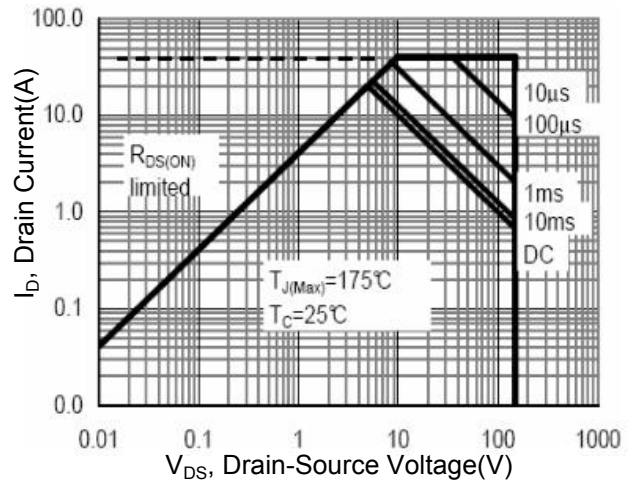
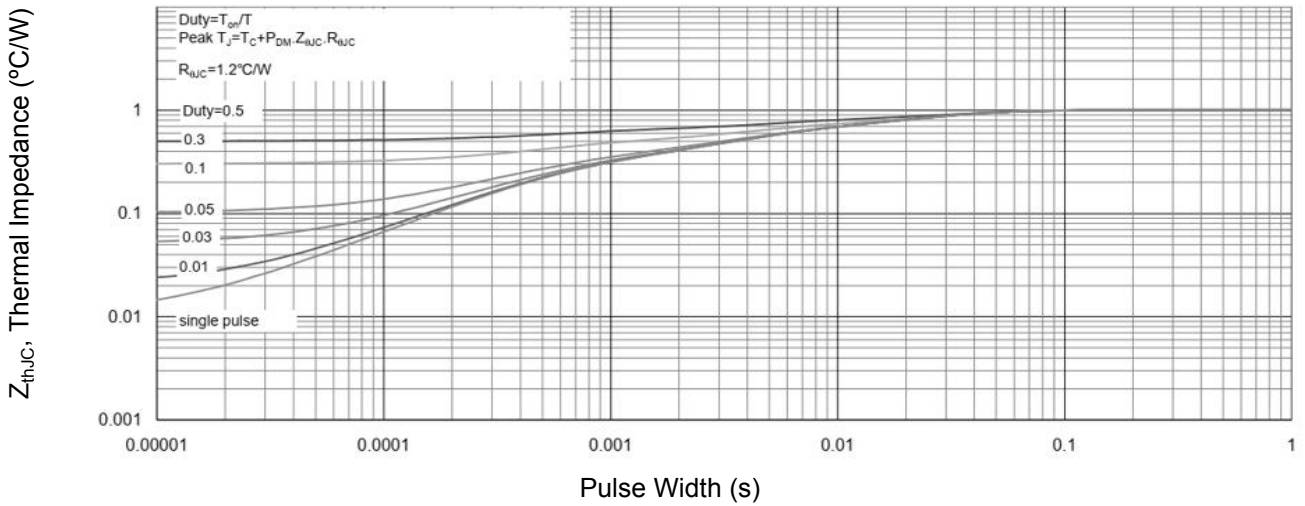
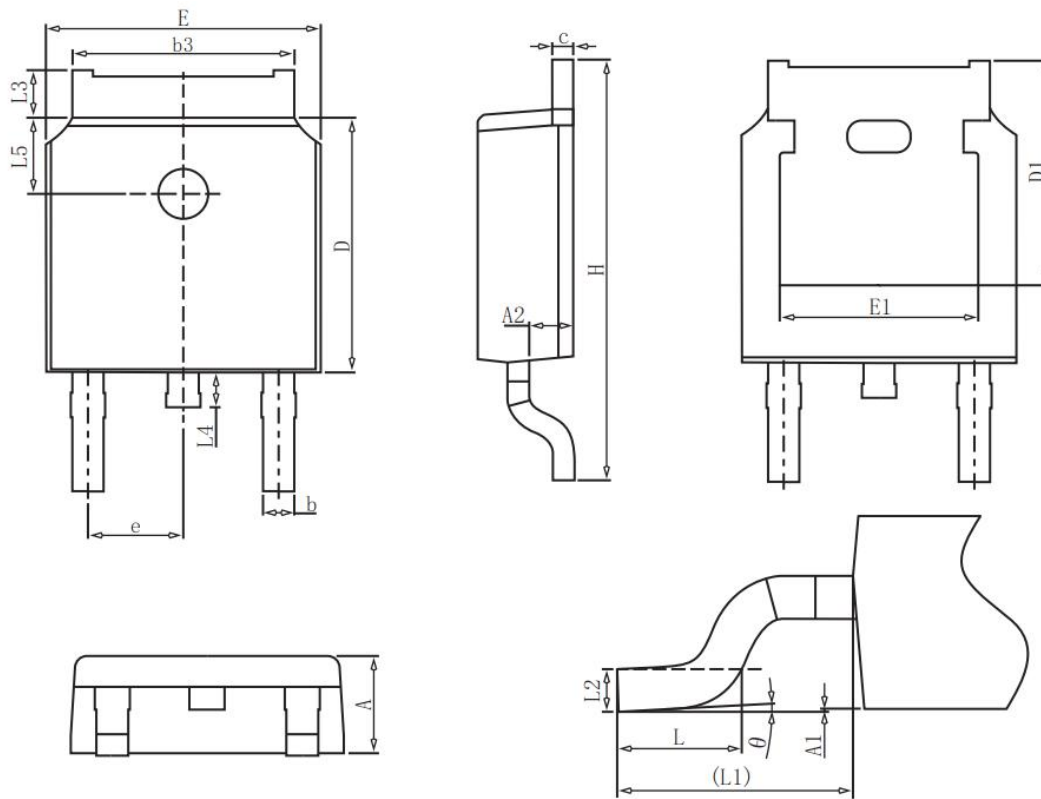


Figure 8. Normalized Maximum Transient Thermal Impedance



TO-252 Package Information



Symbol	Dimensions in Millimeters		
	MIN.	NOM.	MAX.
A	2.2	2.3	2.4
A1	0		0.2
A2	0.97	1.07	1.17
b	0.68	0.78	0.9
b3	5.2	5.33	5.5
c	0.43	0.53	0.63
D	5.98	6.1	6.22
D1	5.30REF		
E	6.4	6.6	6.8
E1	4.63		
e	2.286BSC		
H	9.4	10.1	10.5
L	1.38	1.5	1.75
L1	2.90REF		
L2	0.51BSC		
L3	0.88		1.28
L4	0.5		1
L5	1.65	1.8	1.95
θ	0°		8°