

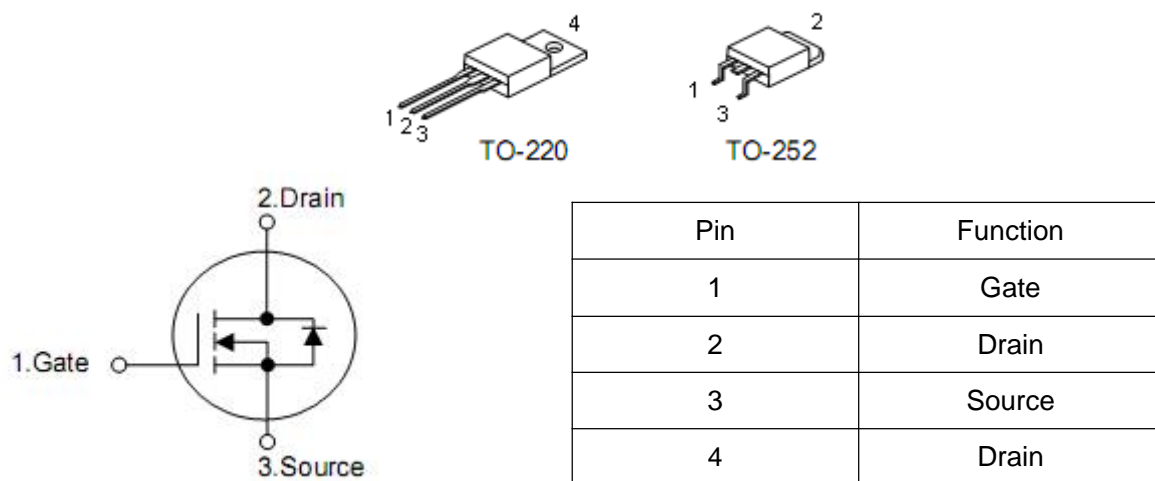
1. Features

- n $V_{GS}=10V$, $R_{DS(on)}=6.5m\Omega@ V_{GS}=10V$
- n Special designed for E-Bike controller application
- n Ultra low On-Resistance
- n High UIS and UIS 100% test

2. Applications

- n 48V E-Bike controller applications
- n Hard switched and high frequency circuits
- n Uninterruptible power supply

3.Symbol



4. Absolute maximum ratings

($T_A=25^{\circ}\text{C}$, unless otherwise noted)

Parameter	Symbol	Rating	Unit
Drain-source voltage	V_{DS}	60	V
Gate-source voltage	V_{GS}	± 25	V
Operating junction and storage temperature range	T_J, T_{STG}	-55 to 175	$^{\circ}\text{C}$
Continuous drain current	I_D	$T_C=25^{\circ}\text{C}$	70
		$T_C=100^{\circ}\text{C}$	49
Drain current-continuous @current-pulsed ¹	I_{DM}	280	A
Peak diode recovery voltage	dv/dt	30	V/ns
Maximum power dissipation $T_C=25^{\circ}\text{C}$	P_D	100	W
Derating factor		0.66	W/ $^{\circ}\text{C}$
Single pulse avalanche energy ²	E_{AS}	410	mJ

Note: 1. Repetitive rating: Pulse width limited by maximum junction temperature.

2. E_{AS} condition: $T_J=25^{\circ}\text{C}$, $V_{DD}=33\text{V}$, $V_G=10\text{V}$, $I_D=40.5\text{A}$.

5. Electrical characteristics

Parameter	Symbol	Value	Unit
Thermal resistance, Junction-case	R_{thJC}	1.5	$^{\circ}\text{C}/\text{W}$

6. Electrical characteristics

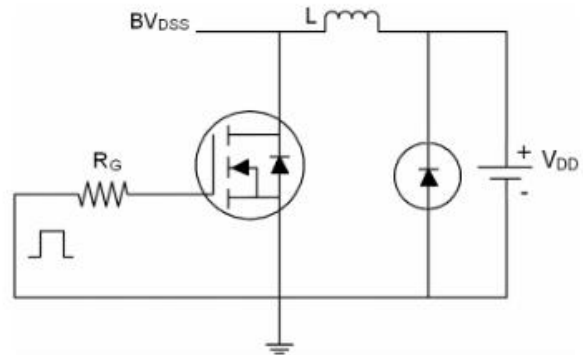
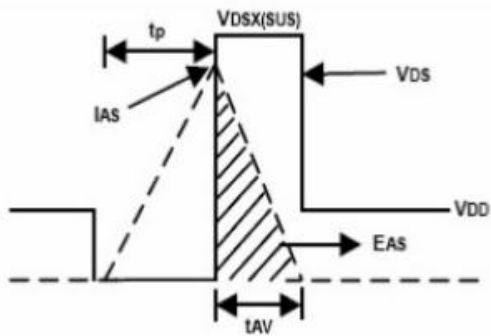
 (T_A=25°C, unless otherwise noted)

Parameter	Symbol	Test Conditions	Min	Typ	Max	Units
Drain-source breakdown voltage	BV _{DSS}	V _{GS} =0V, I _{DS} =250μA	60	-	-	V
Zero gate voltage drain current	I _{DSS}	V _{DS} =68V, V _{GS} =0V T _J =125°C	-	-	1	μA
			-	-	10	
Gate threshold voltage	V _{GS(th)}	V _{DS} =V _{GS} , I _D =250μA	2.0	-	4.0	V
Gate leakage current	I _{GSS}	V _{GS} =±25V, V _{DS} =0V	-	-	±100	nA
Drain-source on-state resistance	R _{DS(on)}	V _{GS} =10V, I _{DS} =40A	-	6.5	8.0	mΩ
Forward transconductance	G _{FS}	V _{DS} =10V, I _D =15A	20	-	-	S
Diode forward voltage	V _{SD}	I _{SD} =40A, V _{GS} =0V	-	0.69	1.1	V
Reverse recovery time ¹	t _{rr}	I _F =75A, T _J =25°C dI _{SD} /dt=100A/μs	-	40	-	nS
Reverse recovery charge ¹	Q _{rr}		-	81	-	Nc
Forward turn-on time	t _{ON}	Intrinsic turn-on time is negligible (turn-on is dominated by L _S +L _D)				
Input capacitance	C _{iss}	V _{DS} =25V, V _{GS} =0V, f=1MHz	-	3483	-	pF
Output capacitance	C _{oss}		-	459	-	
Reverse transfer capacitance	C _{rss}		-	214	-	
Turn-on delay time	t _{d(on)}	V _{DD} =30V, I _{DS} =2A, R _L =15Ω, V _{GS} =-10V R _G =2.5Ω	-	11	-	ns
Rise time	t _r		-	13	-	
Turn-off delay time	t _{d(off)}		-	22	-	
Fall time	t _f		-	27	-	
Total gate charge	Q _g	V _{DS} =50V, V _{GS} =10V I _{DS} =40A	-	82	-	nC
Gate-source charge	Q _{gs}		-	16.2	--	
Gate-drain charge	Q _{gd}		-	36.7	--	
Source-drain current (Body diode)	I _{SD}		-	70	-	A
Pulsed source-drain current	I _{SDM}		-	280	-	A

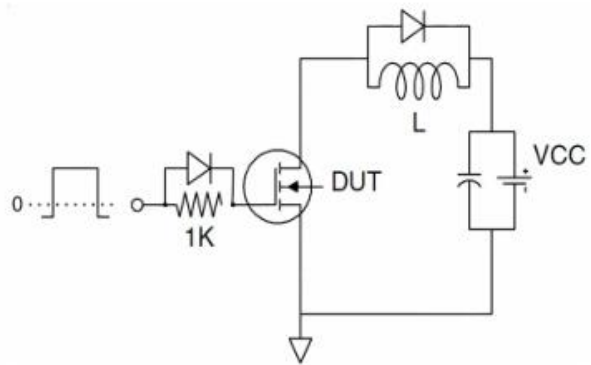
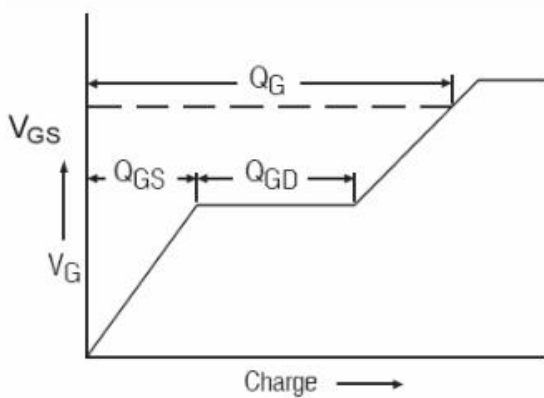
 Note : 1. Pulse test; pulse width ≤ 300μs duty cycle ≤ 1.5%. R_G=25Ω, Starting T_J=25°C

7. Test circuits and waveforms

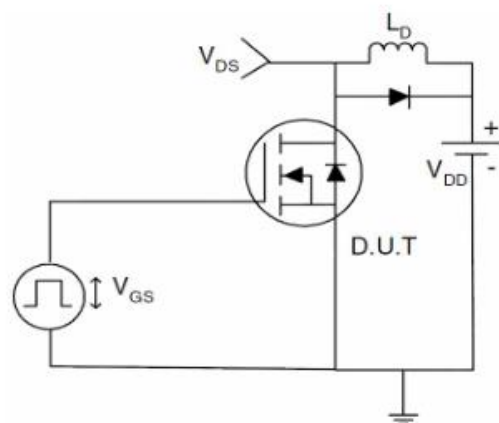
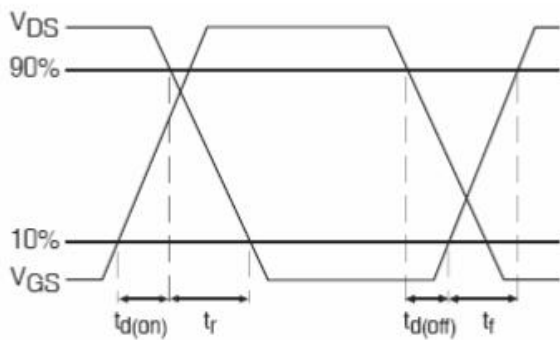
1) E_{AS} Test Circuits



2) Gate Charge Test Circuit:



3) Switch Time Test Circuit:



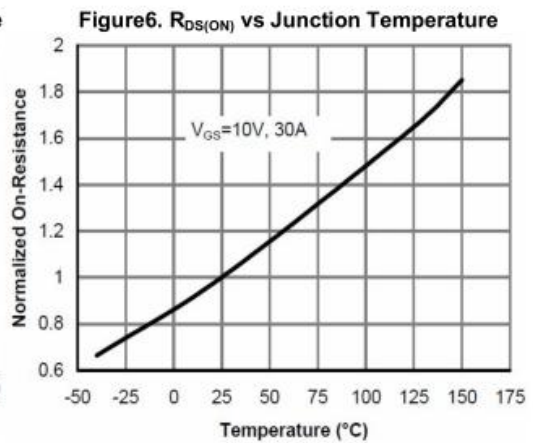
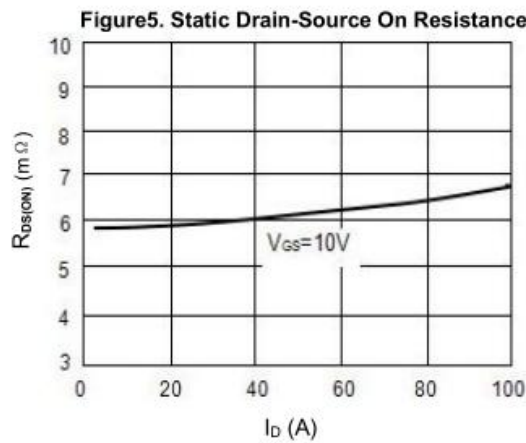
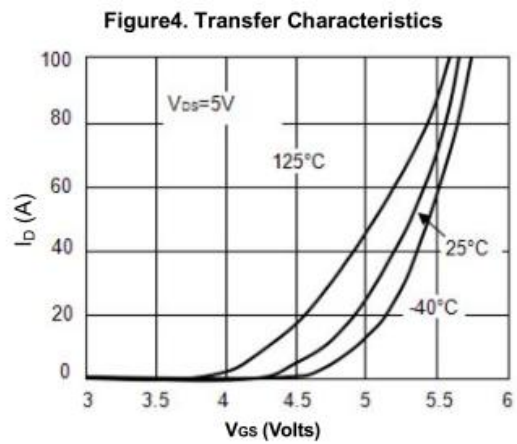
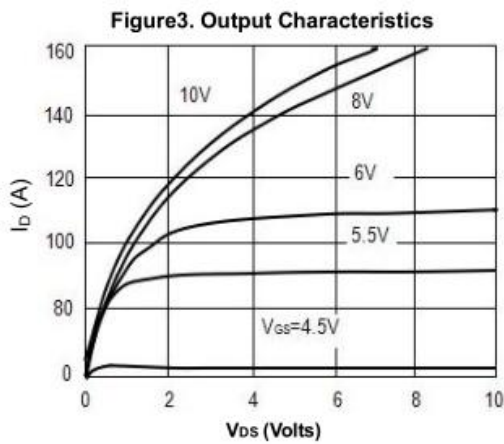
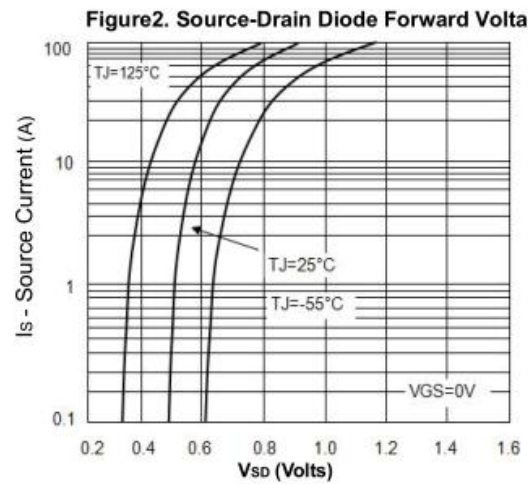
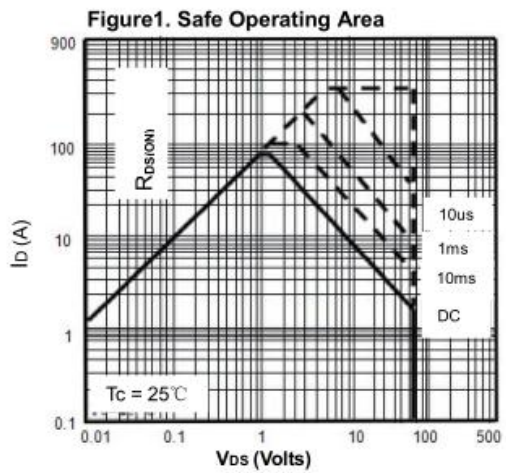


Figure7. BV_{DSS} vs Junction Temperature

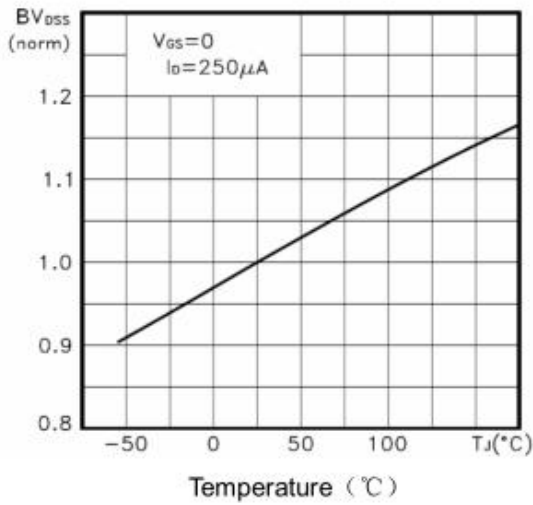


Figure8. $V_{GS(th)}$ vs Junction Temperature

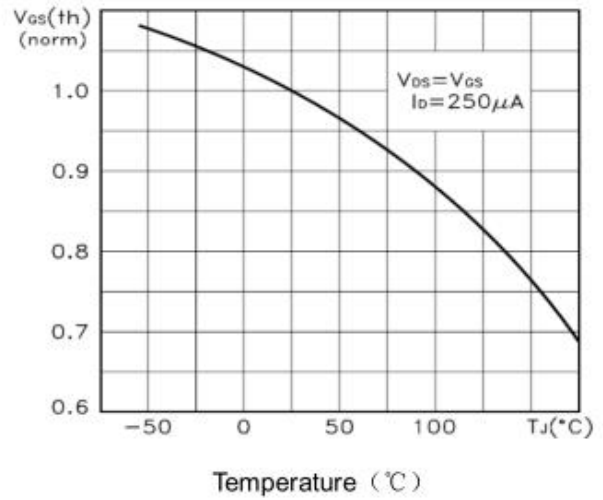


Figure9. Gate Charge Waveforms

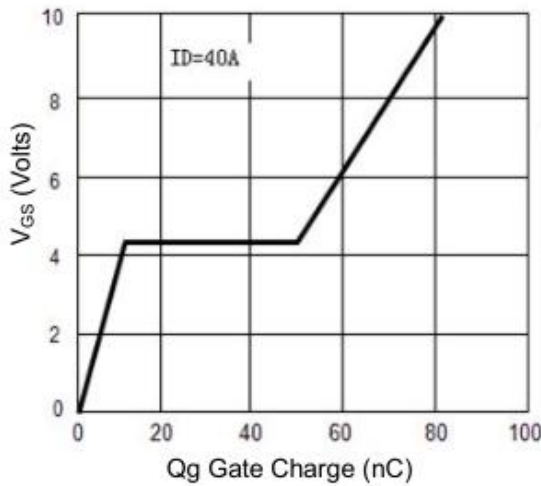


Figure10. Capacitance

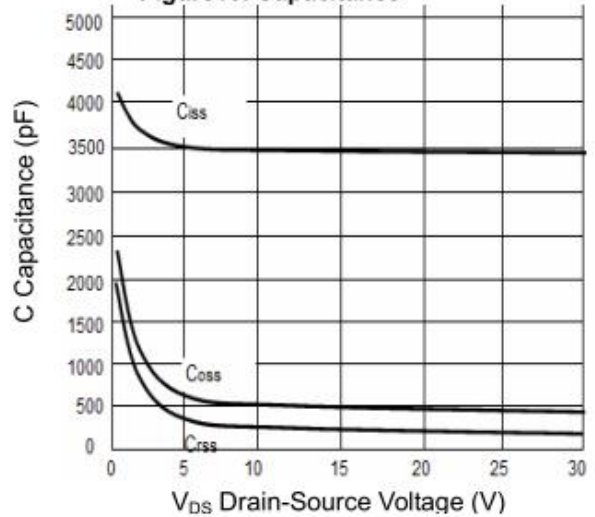


Figure11. Normalized Maximum Transient Thermal Impedance

