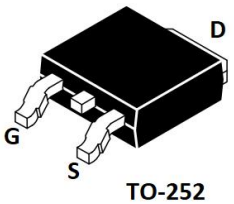
Features

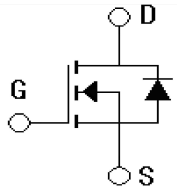
- Low gate charge
- Low Crss (typical 25pF)
- Fast switching
- 100% avalanche tested
- Improved dv/dt capability
- RoHS product



TO-252

Applications

- High efficiency switch mode power supplies
- Electronic lamp ballasts based on half bridge
- UPS



Absolute Ratings (Tc=25℃)

Parameter	Symbol	Value	Unit
Drain-Source Voltage	V_{DSS}	200	V
Transient Gate-Source Voltage	V_{GSM}	±30	V
Continuous Gate-Source Voltage	V_{GSS}	±20	V
Drain Current -continuous	I_D	13	A
Drain Current - pulse(note 1)	I_{DM}	52	A
Single Pulsed Avalanche Energy(note 2)	E_{AS}	180	mJ
Power Dissipation	PD	140	W
Operating and Storage Temperature Range	T_j,T_{STG}	-55~+150	℃
Peak Diode Recovery dv/dt (note 3)	dv/dt	5.5	V/ns
Maximum Lead Temperature for Soldering Purposes	T_L	300	℃

Electrical Characteristics(T_{CASE}=25℃ unless otherwise specified)

Parameter	Symbol	Tests conditions	Min	Type	Max	Units
Off-Characteristics						

Drain-Source Voltage	BV_{DSS}	I_D=250μA,V_{GS}=0V	200	-	-	V
Drain cut-off current	I_{DSS}	V_{DS}=200V,V_{GS}=0V	-	-	1	μA
Gate-body leakage current	I_{GSS}	V_{DS}=0V,V_{GS}=±20V	-	-	±100	nA
On-Characteristics						
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS}=V_{GS},I_D=250uA	2	-	4	V
Static Drain-Source On-Resistance	$R_{DS(ON)}$	V_{GS}=10V,I_D=6.5A (note4)	80	120	150	mΩ
Forward Transconductance	G_{fs}	V_{DS}=40V,I_D=6..5A (note4)	-	14.5	-	S
Dynamic Characteristics						
Input capacitance	C_{iss}	V_{DS}=25V, V_{GS}=0V, f=1.0MHz(note 5)	350	1001	1650	pF
Output capacitance	C_{oss}		104	173	300	pF
Reverse transfer capacitance	C_{rss}		15	25	40	pF
Gate Resistance	R_G	f=1.0MHZ	0.5	1.5	2.5	Ω
Switching Characteristics						
Turn-On delay time	td(on)	V_{DD}=100V,I_D=13A., R_G=25Ω	9	15.2	21	ns
Turn-On rise time	t_r		16.5	38.7	60	ns
Turn-Off delay time	$T_{d(off)}$		21.5	46.4	71.5	ns
Turn-Off Fall time	t_f		6.8	12.8	18.8	ns
Total Gate Charge	Q_g	V_{DS}=160V, I_D=13A, V_{GS}=10V(note 5)	12	27.5	42	nC
Gate-Source charge	Q_{gs}		2.5	5.7	8.9	nC
Gate-Drain charge	Q_{gd}		5.8	10.8	15.8	nC
Drain-Source Diode Characteristics and Maximum Ratings						
Drain-Source Diode Forward Voltage	V_{SD}	V_{GS}=0V,I_S=13A(note 4)	-	-	1.4	V
Maximum Continuous Drain-Source Diode Forward Current	I_S		-	-	13	A
Reverse recovery time	t_{rr}	V_{GS}=0V,IF=13A dIF/dt=100A/us	124	224	324	ns
Reverse recovery charge	Q_{rr}		0.58	1.38	2.18	μC

Thermal Characteristic

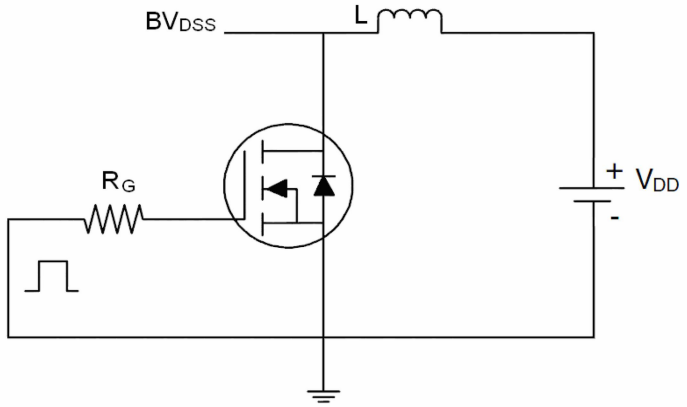
Parameter	Symbol	Value	Unit
Thermal Resistance, Junction-to-Case,Max	$R_{\theta JC}$	0.89	℃/W
Thermal Resistance, Junction-to-Ambient,Max	$R_{\theta JA}$	62.5	

Notes:

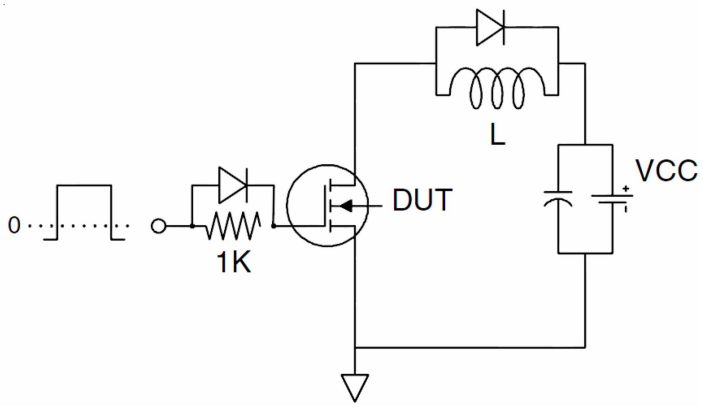
1. Pulse width limited by maximum junction temperature
2. L=1.6mH, IAS=13A, VDD=50V, RG=25 Ω,Starting TJ=25℃
3. ISD ≤13A,di/dt ≤200A/μs, VDD≤BVDSS, Starting TJ=25℃
4. Pulse Test：Pulse Width ≤300μs, Duty Cycle≤2％
5. Essentially independent of operating temperature

Test Circuit

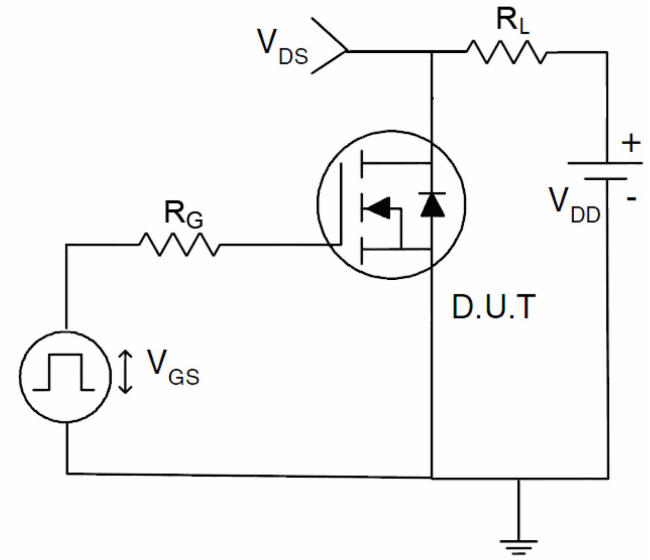
1) E_{AS} test Circuit



2) Gate charge test Circuit

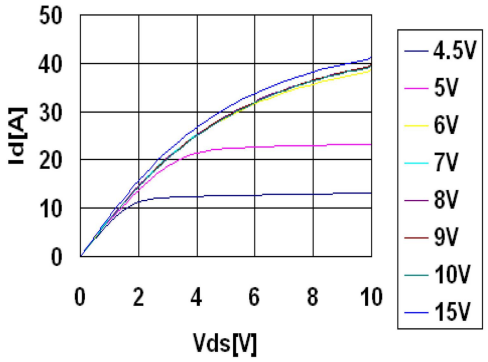


3) Switch Time Test Circuit

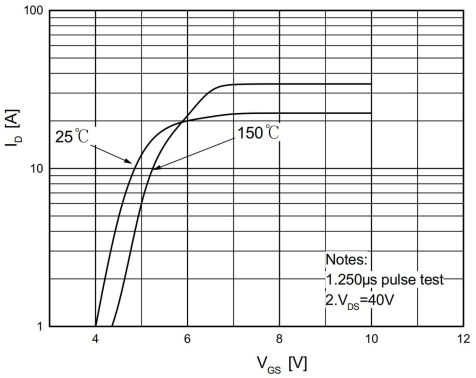


Typical Electrical and Thermal Characteristics (Curves)

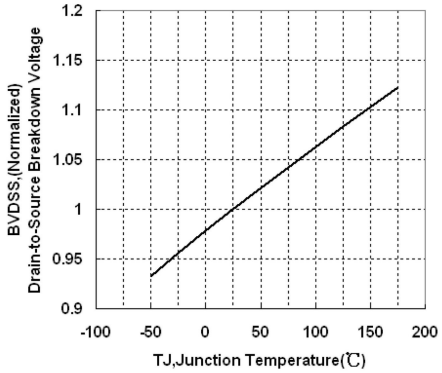
Typical Output Characteristics,Tc=25℃



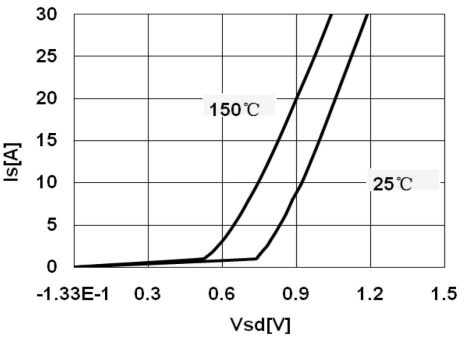
Transfer Characteristics



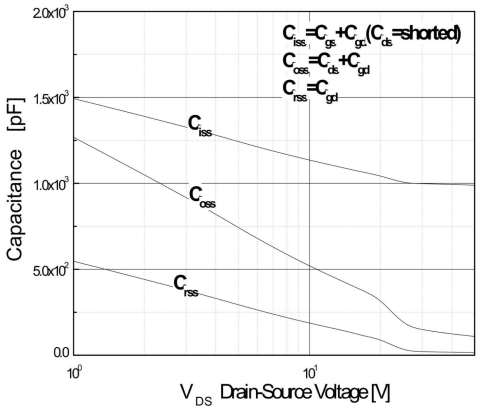
Breakdown Voltage Variation vs. Temperature



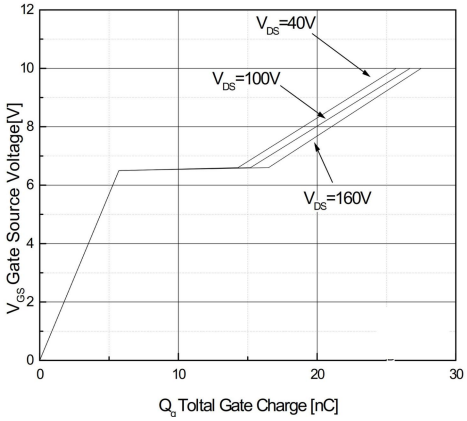
Body Diode Forward Voltage Variation vs.Source Current and Temperature



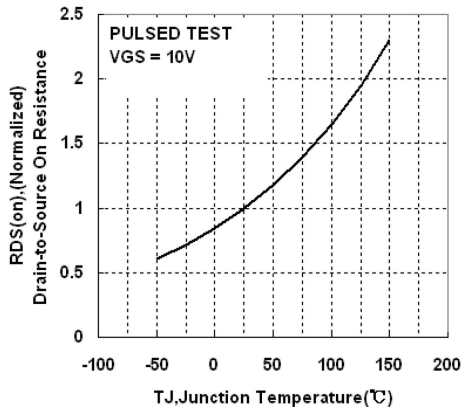
Capacitance Characteristics



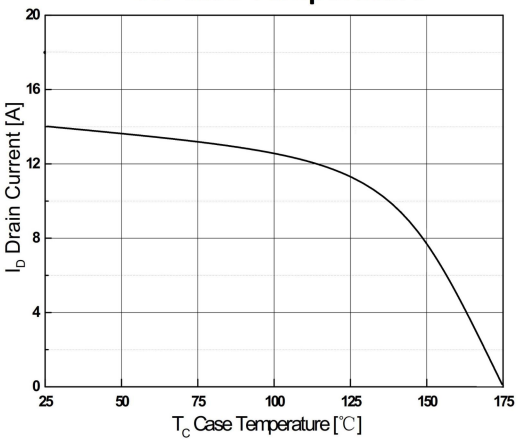
Gate Charge Characteristics



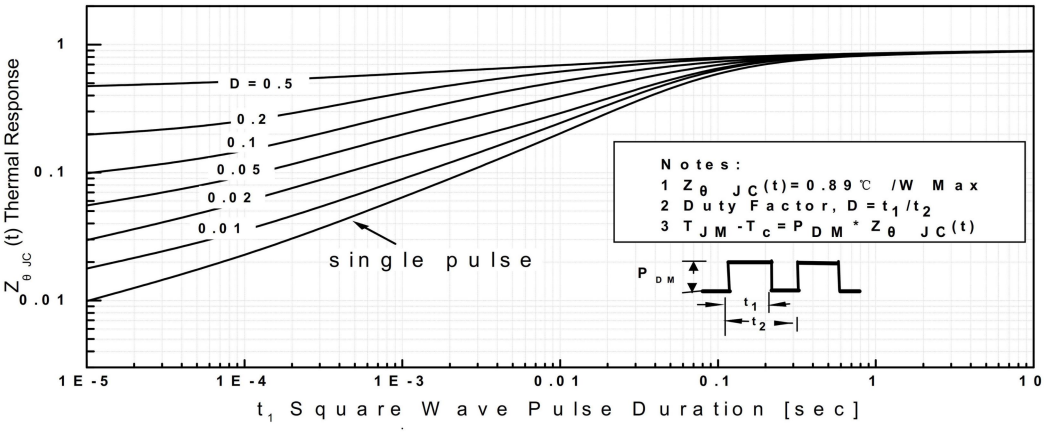
On-Resistance Variation vs. Temperature



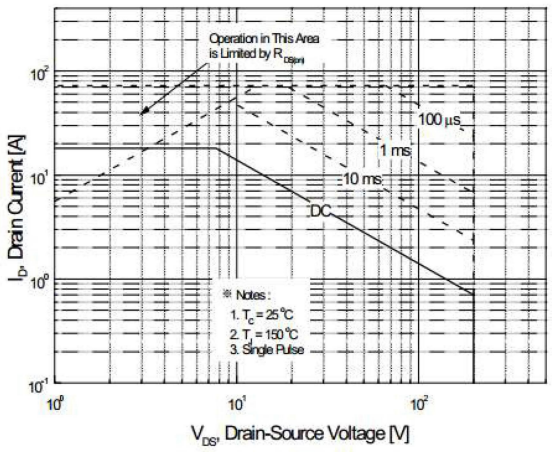
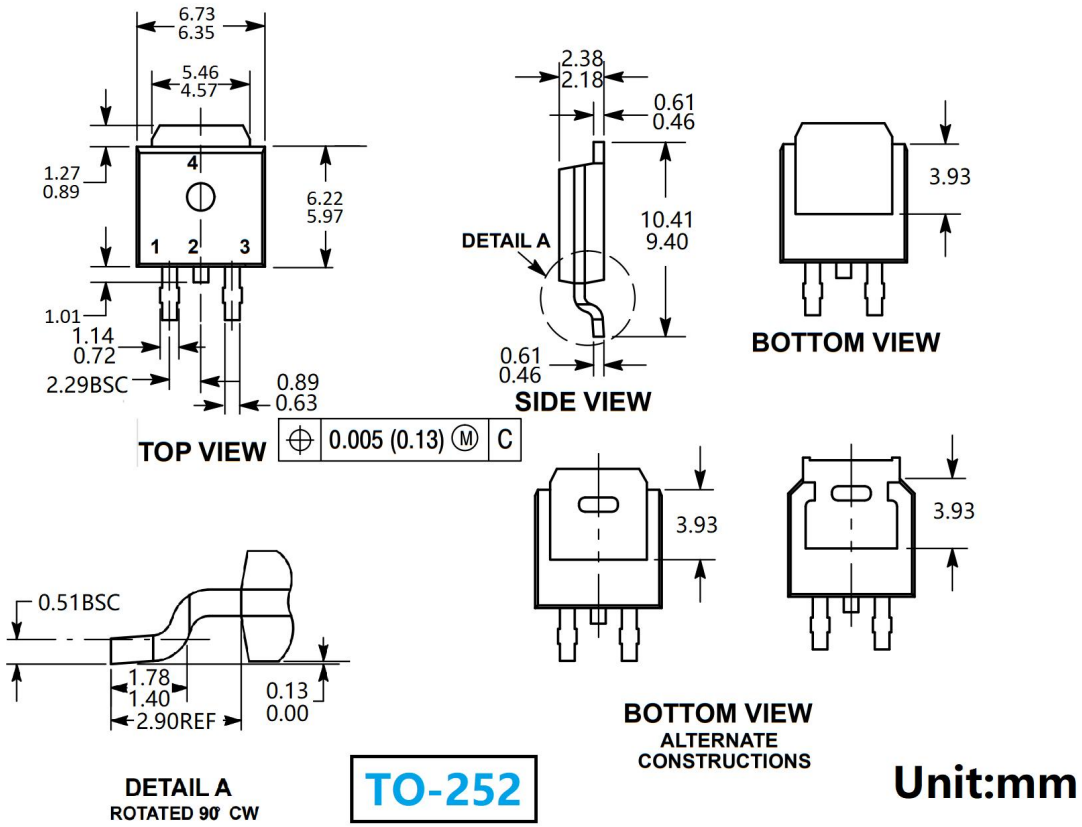
Maximum Drain Current vs. Case Temperature



Transient Thermal Response Curve



Maximum Safe Operating Area



Package Mechanical DATA