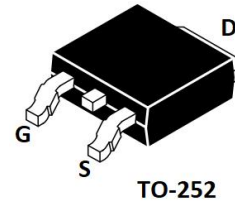


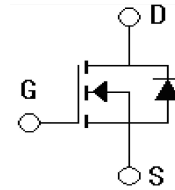
## Features

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



## Applications

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



## Absolute Ratings (Tc=25°C)

Parameter	Symbol	Value	Unit
Drain-Source Voltage	V <sub>DSS</sub>	200	V
Drain Current -continuous	I <sub>D</sub>	13	A
Drain Current - pulse	I <sub>DM</sub>	52	A
Gate-Source Voltage	V <sub>GSS</sub>	±30	V
Single Pulsed Avalanche Energy	E <sub>AS</sub>	259	mJ
Power Dissipation	PD	140	W
Operating and Storage Temperature Range	T <sub>J</sub> , T <sub>STG</sub>	-55~+175	°C
Peak Diode Recovery dv/dt	dv/dt	5.5	V/ns
Maximum Lead Temperature for Soldering Purposes	T <sub>L</sub>	300	°C

\*Drain current limited by maximum junction temperature

## Electrical Characteristics (T<sub>CASE</sub>=25°C unless otherwise specified)

Parameter	Symbol	Tests conditions	Min	Type	Max	Units
<b>Off-Characteristics</b>						
Drain-Source Voltage	BV <sub>DSS</sub>	I <sub>D</sub> =250μA, V <sub>GS</sub> =0V	200	-	-	V
Drain cut-off current	I <sub>DSS</sub>	V <sub>DS</sub> =200V, V <sub>GS</sub> =0V	-	-	1	μA
Gate-body leakage current, forward	I <sub>GSSF</sub>	V <sub>DS</sub> =0V, V <sub>GS</sub> =30V	-	-	100	nA
Gate-body leakage current, reverse	I <sub>GSSR</sub>	V <sub>DS</sub> =0V, V <sub>GS</sub> =-30V	-	-	-100	nA

On-Characteristics						
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS}=V_{GS}, I_D=250\mu A$	2	-	4	V
Static Drain-Source On-Resistance	$R_{DS(on)}$	$V_{GS}=10V, I_D=6.5A$	80	120	150	m $\Omega$
Forward Transconductance	Gfs	$V_{DS}=40V, I_D=6.5A$	-	14.5	-	S
Dynamic Characteristics						
Input capacitance	Ciss	$V_{DS}=25V,$ $V_{GS}=0V,$ $f=1.0MHz$	350	1001	1650	pF
Output capacitance	Coss		104	173	300	pF
Reverse transfer capacitance	Crss		15	25	40	pF
Gate Resistance	$R_G$	$f=1.0MHz$	0.5	1.5	2.5	$\Omega$
Switching Characteristics						
Turn-On delay time	$t_{d(on)}$	$V_{DD}=100V, I_D=13A.,$ $R_G=25\Omega$	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	Qg	$V_{DS}=160V,$ $I_D=13A,$ $V_{GS}=10V$	12	27.5	42	nC
Gate-Source charge	Qgs		2.5	5.7	8.9	nC
Gate-Drain charge	Qgd		5.8	10.8	15.8	nC
Drain-Source Diode Characteristics and Maximum Ratings						
Drain-Source Diode Forward Voltage	$V_{SD}$	$V_{GS}=0V, I_S=13A$	-	-	1.4	V
Maximum Continuous Drain-Source Diode Forward Current		$I_S$	-	-	13	A
Reverse recovery time	trr	$V_{GS}=0V, I_F=13A$ $dI_F/dt=100A/\mu s$	124	224	324	ns
Reverse recovery charge	Qrr		0.58	1.38	2.18	$\mu C$

### Thermal Characteristic

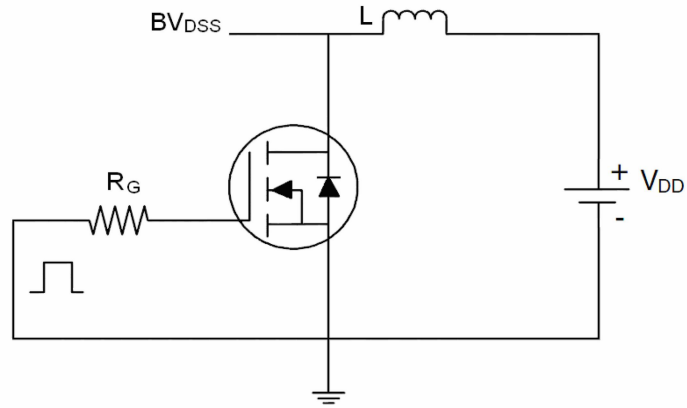
Parameter	Symbol	Value	Unit
Thermal Resistance, Junction-to-Case	$R_{\theta JC}$	0.89	$^{\circ}C/W$
Thermal Resistance, Junction-to-Ambient	$R_{\theta JA}$	62.5	

Notes:

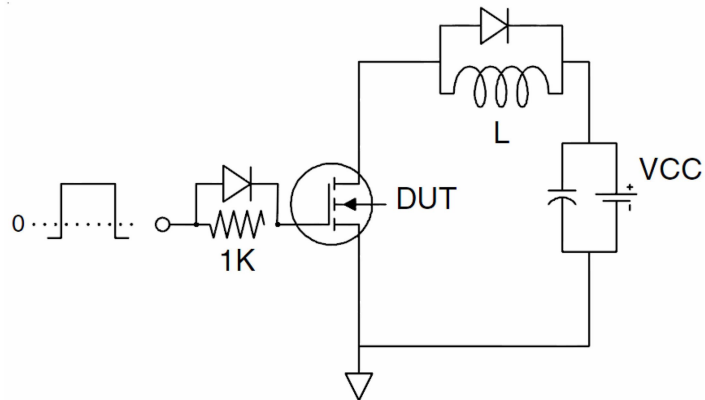
1. Pulse width limited by maximum junction temperature
2.  $L=1.6mH, I_{AS}=13A, V_{DD}=50V, R_G=25\Omega, \text{Starting } T_J=25^{\circ}C$
3.  $I_{SD} \leq 13A, di/dt \leq 200A/\mu s, V_{DD} \leq B_{VDSS}, \text{Starting } T_J=25^{\circ}C$
4. Pulse Test: Pulse Width  $\leq 300\mu s, \text{Duty Cycle} \leq 2\%$
5. Essentially independent of operating temperature

## Test Circuit

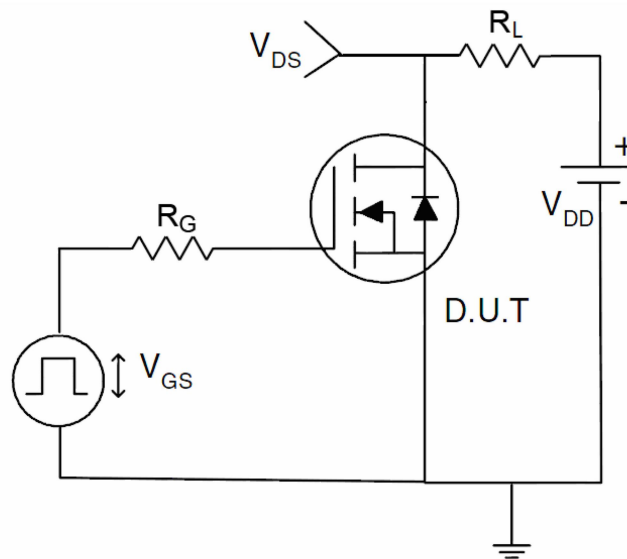
### 1) $E_{AS}$ test Circuit



### 2) Gate charge test Circuit

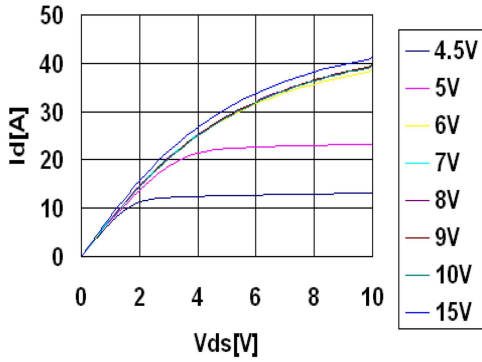


### 3) Switch Time Test Circuit

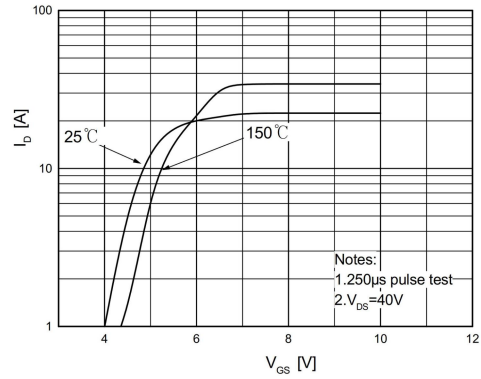


## Typical Electrical and Thermal Characteristics (Curves)

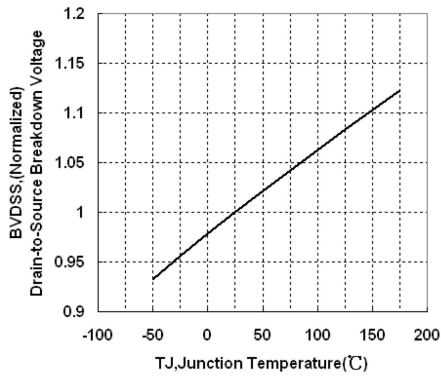
Typical Output Characteristics,  $T_c=25^\circ\text{C}$



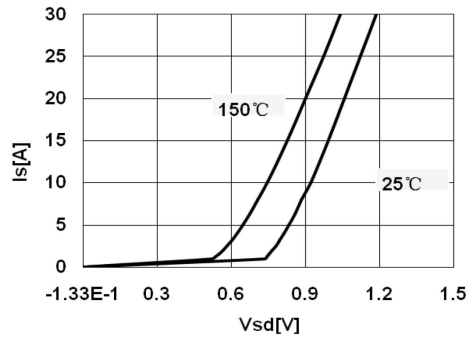
Transfer Characteristics



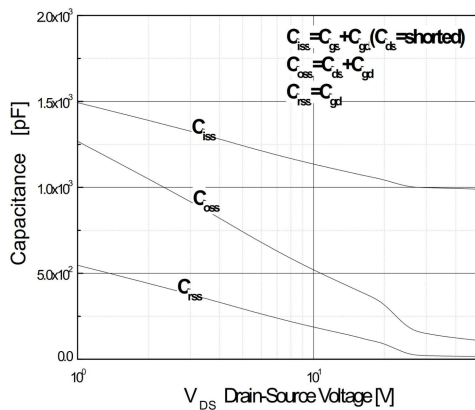
Breakdown Voltage Variation vs. Temperature



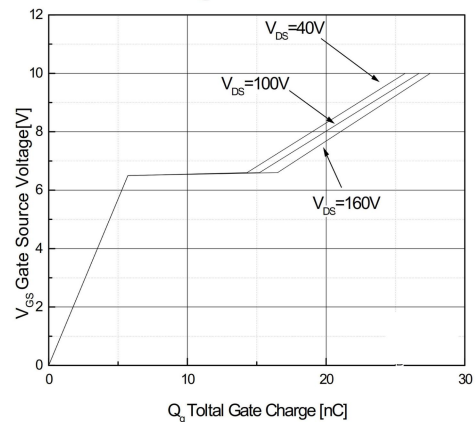
Body Diode Forward Voltage Variation vs. Source Current and Temperature



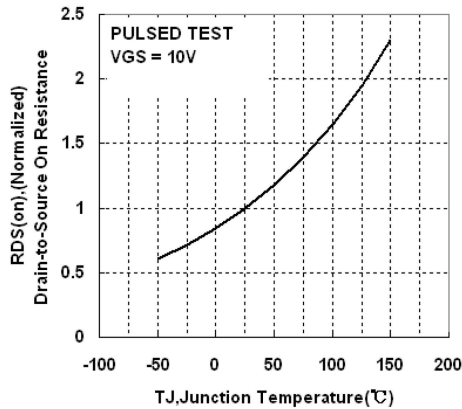
Capacitance Characteristics



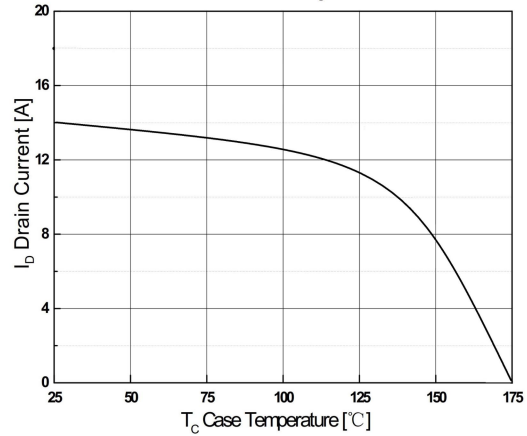
Gate Charge Characteristics



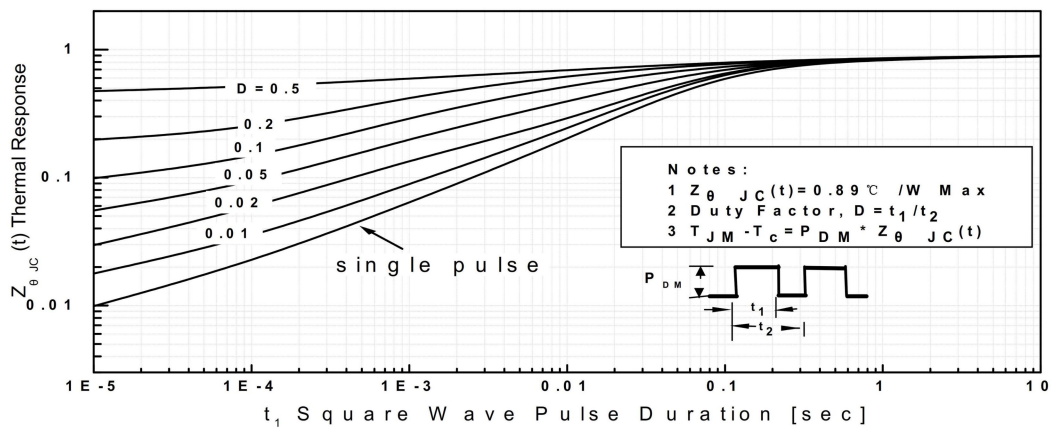
### On-Resistance Variation vs. Temperature



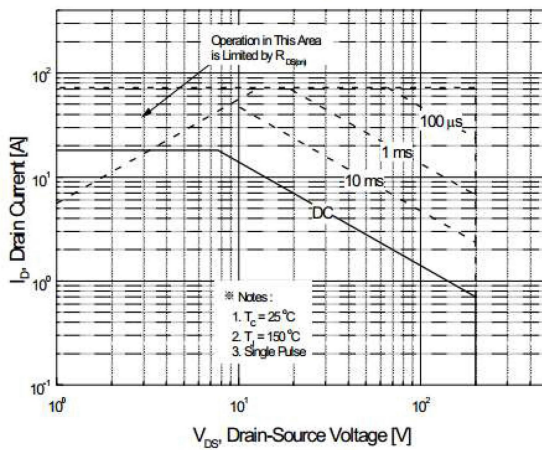
### Maximum Drain Current vs. Case Temperature



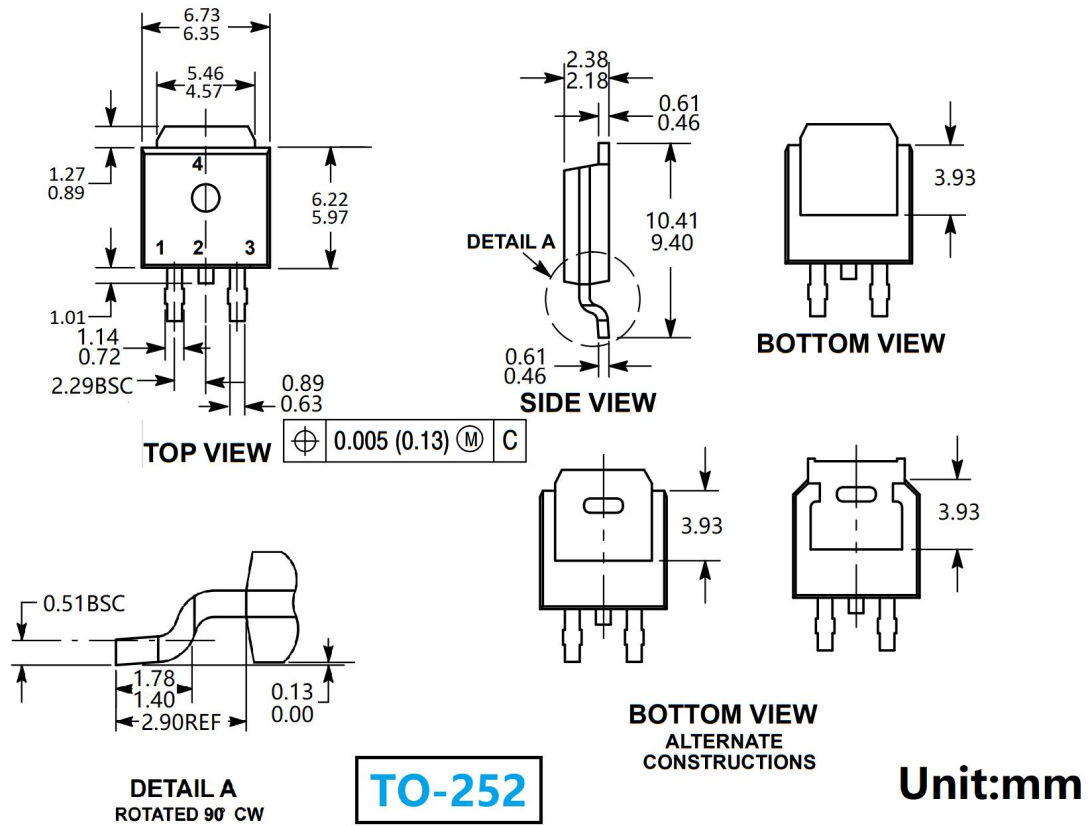
### Transient Thermal Response Curve



### Maximum Safe Operating Area



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