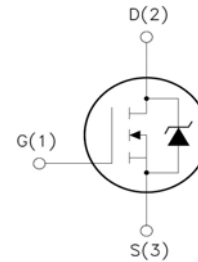
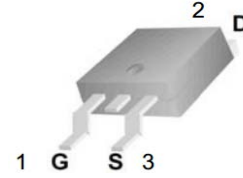


Features:

- Low Intrinsic Capacitances.
- Excellent Switching Characteristics.
- Extended Safe Operating Area.
- Unrivalled Gate Charge :Qg= 50nC (Typ.).
- BVDSS=60V, I_D=30A
- R_{DS(on)} : 0.035Ω (Max) @V_G=10V
- 100% Avalanche Tested

TO-252



- 1.Gate (G)
- 2.Drain (D)
- 3.Source (S)

Absolute Maximum Ratings* (T_c=25°C Unless otherwise noted)

Symbol	PARAMETER	Value	Unit
V _{DSS}	Drain-Source Voltage	60	V
I _D	Drain Current	T _C =25°C	30
		T _C =100°C	21
V _{GS(TH)}	Gate Threshold Voltage	±20	V
E _{AS}	Single Pulse Avalanche Energy (note1)	72	mJ
I _{AR}	Avalanche Current (note2)	90	A
P _D	Power Dissipation (T _c =25°C)	45	W
T _j	Junction Temperature(MAX)	175	°C
T _{stg}	Storage Temperature	-55~+175	°C
TL	Maximum lead temperature for soldering purpose, 1/8" from case for 5 seconds	300	°C

Thermal Characteristics

Symbol	PARAMETER	Typ.	MAX.	Unit
R _{θJC}	Thermal Resistance, Junction to Case	-	3.3	°C/W
R _{θJA}	Thermal Resistance, Junction to Ambient	-	-	°C/W
R _{θCS}	Thermal Resistance, Case to Sink	-	110	°C/W

Electrical Characteristics ($T_C=25^\circ\text{C}$ unless otherwise noted)

Parameter	Symbol	Condition	Min	Typ	Max	Unit
Off Characteristics						
Drain-Source Breakdown Voltage	BV_{DSS}	$V_{GS}=0V, I_D=250\mu A$	60	-	-	V
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS}=60V, V_{GS}=0V$	-	-	1	μA
Gate-Body Leakage Current	I_{GSS}	$V_{GS}=\pm 20V, V_{DS}=0V$	-	-	± 100	nA
On Characteristics (Note 3)						
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS}=V_{GS}, I_D=250\mu A$	1.2	1.6	2.5	V
Drain-Source On-State Resistance	$R_{DS(on)}$	$V_{GS}=10V, I_D=30A$	-	24	35	m Ω
Forward Transconductance	g_{FS}	$V_{DS}=5V, I_D=5A$	11	-	-	S
Dynamic Characteristics (Note 4)						
Input Capacitance	C_{iss}	$V_{DS}=15V, V_{GS}=0V,$ $F=1.0MHz$	-	590	-	PF
Output Capacitance	C_{oss}		-	70	-	PF
Reverse Transfer Capacitance	C_{riss}		-	64	-	PF
Switching Characteristics (Note 4)						
Turn-on Delay Time	$t_{d(on)}$	$V_{DD}=30V, I_D=2A,$ $V_{GS}=10V, R_G=3\Omega$	-	6.0	-	nS
Turn-on Rise Time	t_r		-	6.1	-	nS
Turn-Off Delay Time	$t_{d(off)}$		-	17	-	nS
Turn-Off Fall Time	t_f		-	3.0	-	nS
Total Gate Charge	Q_g	$V_{DS}=30V, I_D=15A,$ $V_{GS}=10V$	-	25.3	-	nC
Gate-Source Charge	Q_{gs}		-	4.7	-	nC
Gate-Drain Charge	Q_{gd}		-	6.1	-	nC
Drain-Source Diode Characteristics						
Diode Forward Voltage	V_{SD}	$V_{GS}=0V, I_S=30A$	-	-	1.2	V
Diode Forward Current	I_S		-	-	30	A
Reverse Recovery Time	t_{rr}	$T_J = 25^\circ\text{C}, I_F = 30A$ $di/dt = 100A/\mu s$ (Note 3)	-	29.5	-	nS
Reverse Recovery Charge	Q_{rr}		-	50	-	nC
Forward Turn-On Time	t_{on}	Intrinsic turn-on time is negligible (turn-on is dominated by LS+LD)				

Notes:

1. Repetitive Rating: Pulse width limited by maximum junction temperature.
2. Surface Mounted on FR4 Board, $t \leq 10$ sec.
3. Pulse Test: Pulse Width $\leq 300\mu s$, Duty Cycle $\leq 2\%$.
4. Guaranteed by design, not subject to production
5. EAS condition : $T_J=25^\circ\text{C}, V_{DD}=30V, V_G=10V, L=0.5mH, R_g=25\Omega$

Typical Characteristics

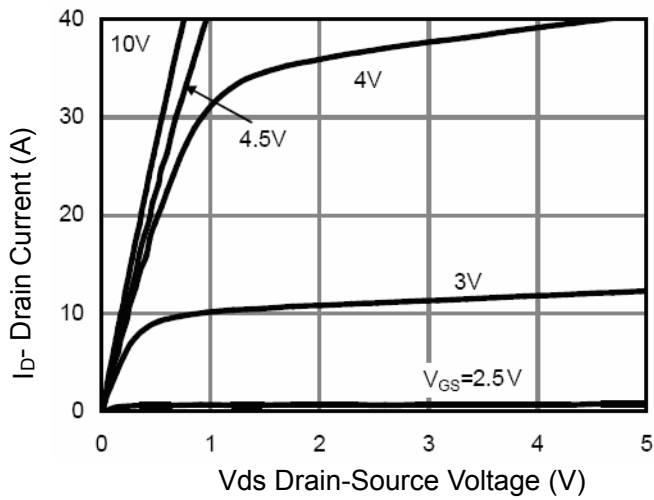


Figure 1 Output Characteristics

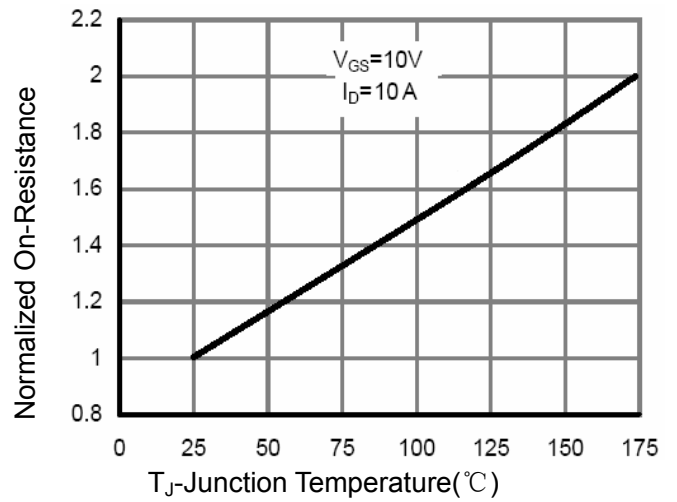


Figure 4 Rdson-Junction Temperature

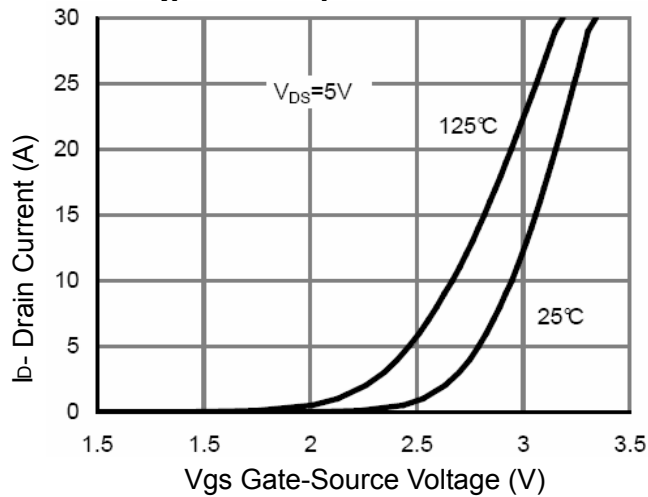


Figure 2 Transfer Characteristics

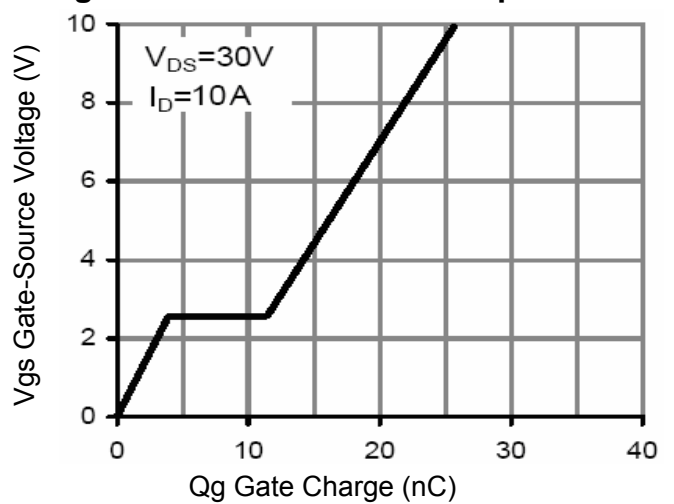


Figure 5 Gate Charge

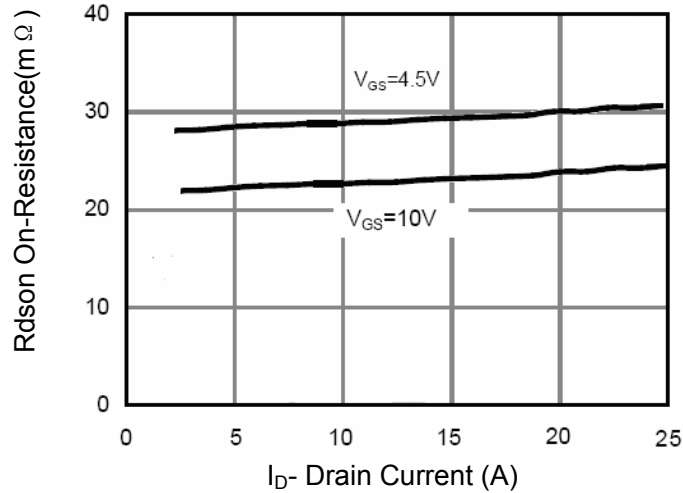


Figure 3 Rdson- Drain Current

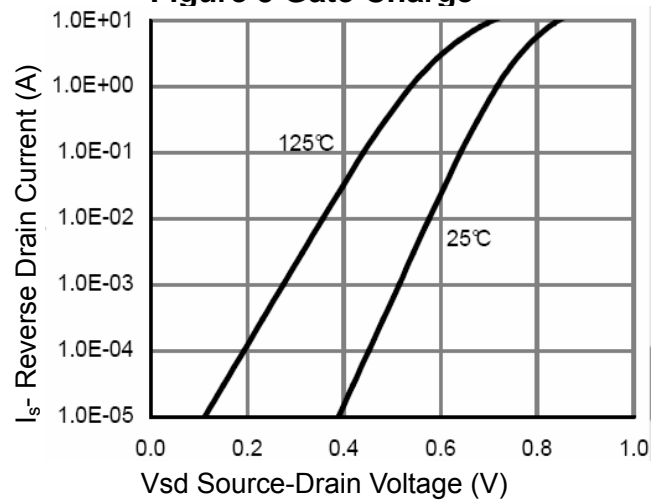


Figure 6 Source- Drain Diode Forward

Typical Characteristics (Continued)

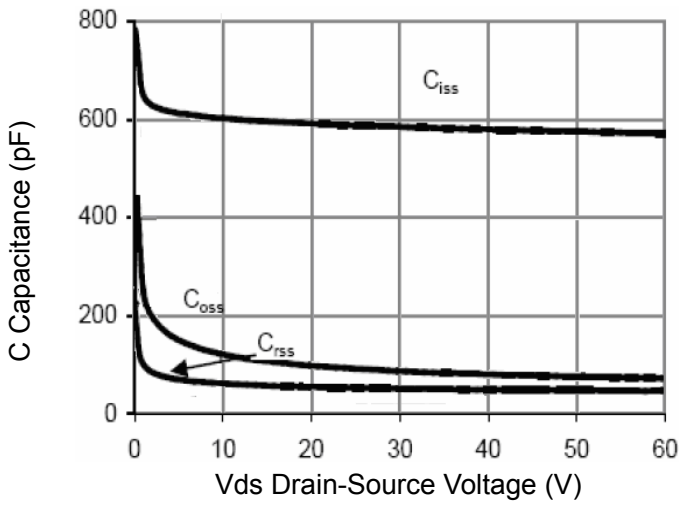


Figure 7 Capacitance vs Vds

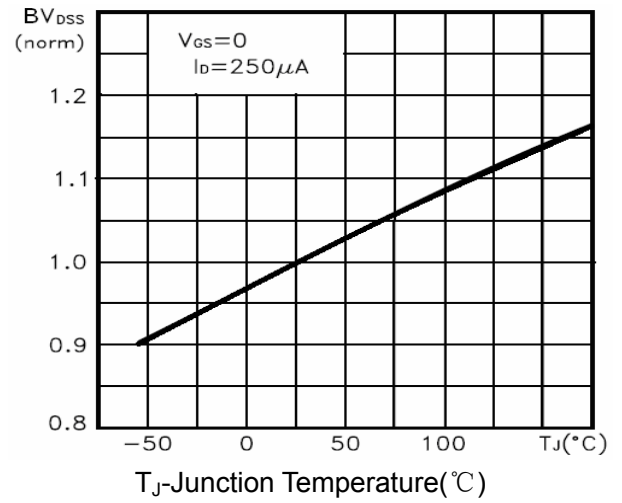


Figure 9 BV_{DSS} vs Junction Temperature

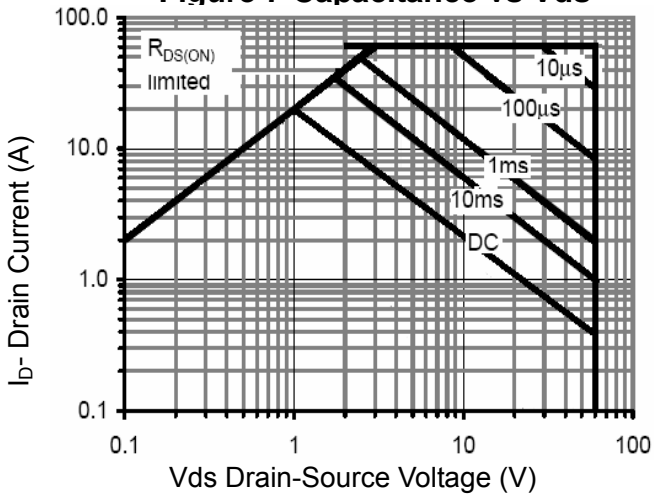


Figure 8 Safe Operation Area

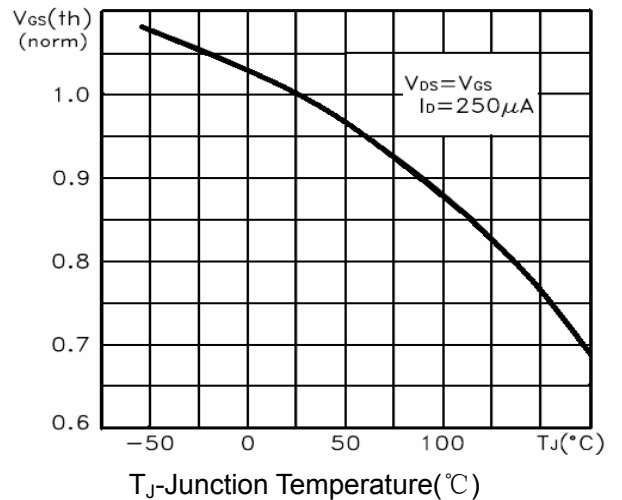


Figure 10 V_{gs(th)} vs Junction Temperature

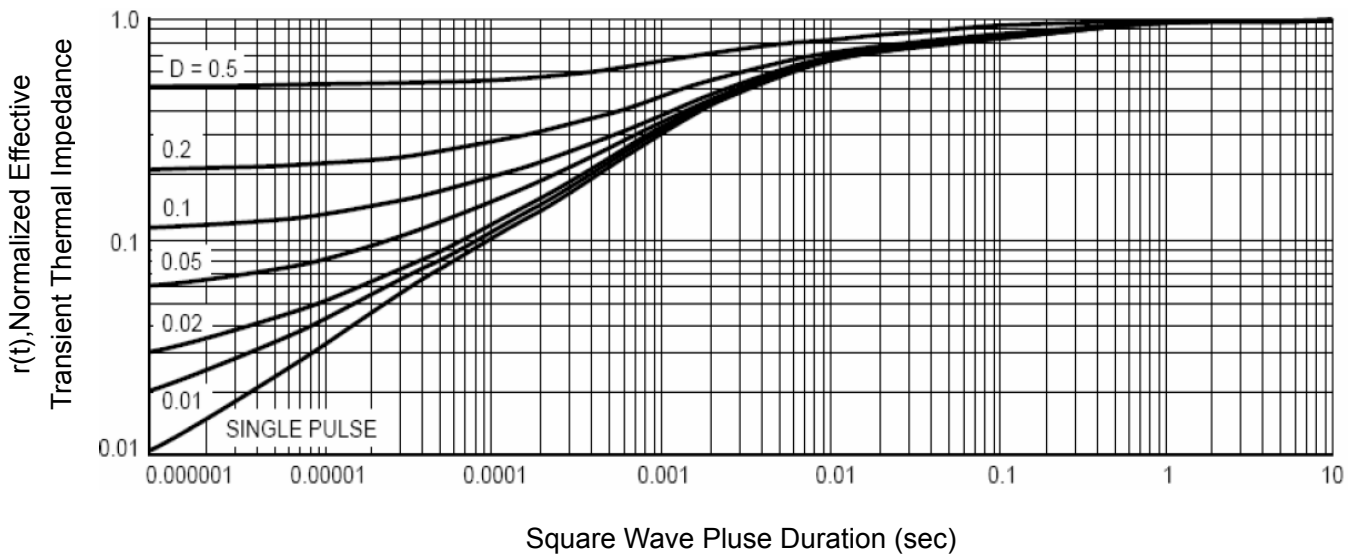
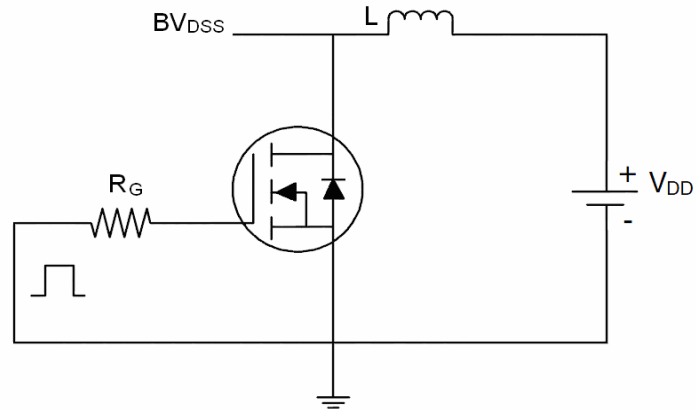


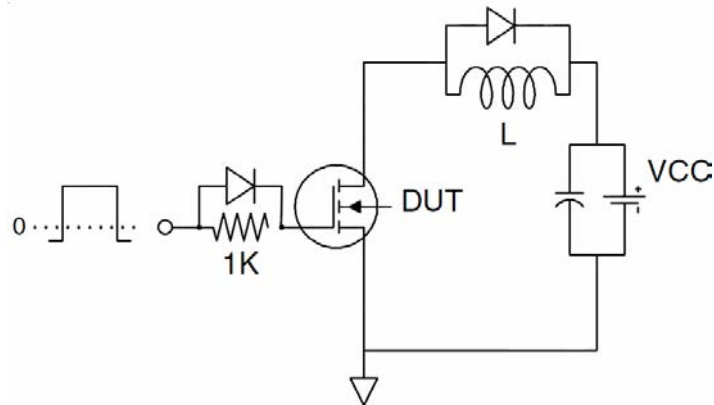
Figure 11 Normalized Maximum Transient Thermal Impedance

Test Circuit

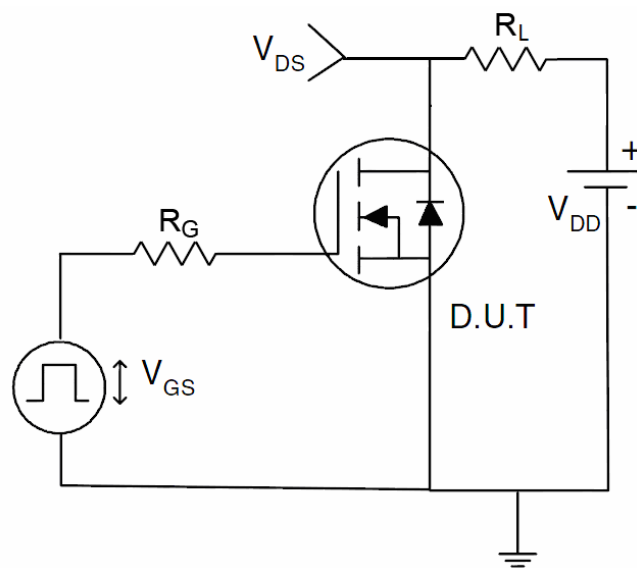
1) E_{AS} test Circuit



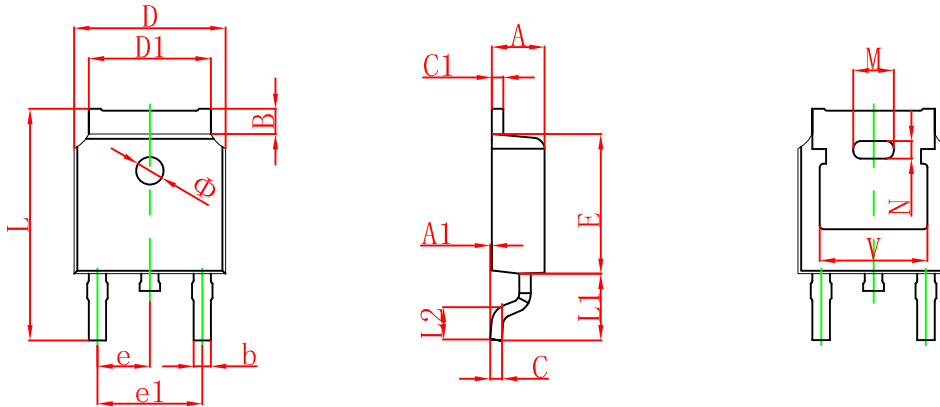
2) Gate charge test Circuit



3) Switch Time Test Circuit

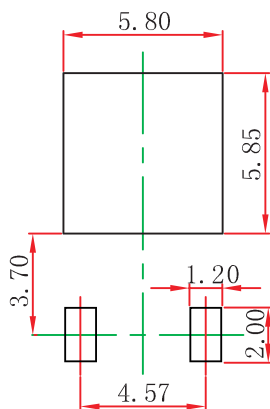


Package Dimension



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	2.200	2.380	0.087	0.094
A1	0.000	0.100	0.000	0.004
B	0.800	1.400	0.031	0.055
b	0.710	0.810	0.028	0.032
c	0.460	0.560	0.018	0.022
c1	0.460	0.560	0.018	0.022
D	6.500	6.700	0.256	0.264
D1	5.130	5.460	0.202	0.215
E	6.000	6.200	0.236	0.244
e	2.286 TYP.		0.090 TYP.	
e1	4.327	4.727	0.170	0.186
M	1.778REF.		0.070REF.	
N	0.762REF.		0.018REF.	
L	9.800	10.400	0.386	0.409
L1	2.9REF.		0.114REF.	
L2	1.400	1.700	0.055	0.067
V	4.830 REF.		0.190 REF.	
Φ	1.100	1.300	0.043	0.051

TO-252-2L Suggest Pad Layout



NOTE:

1. Controlling dimension: in millimeters.
2. General tolerance: $\pm 0.05\text{mm}$.
3. The pad layout is for reference purposes only.