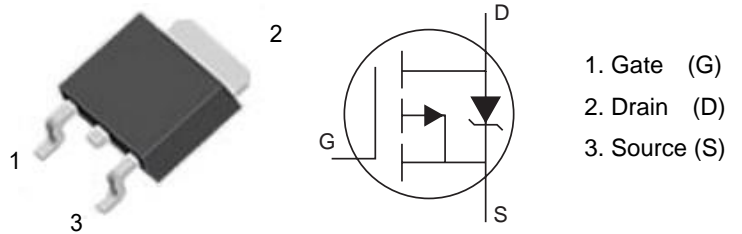


Features

- $V_{DS} = -100V, I_D = -13A$
 $R_{DS(ON)} < 200m\Omega @ V_{GS} = -10V$ (Typ: 170m Ω)
- Super high dense cell design
- Advanced trench process technology
- Reliable and rugged
- High density cell design for ultra low on-resistance

TO-252



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

Absolute Maximum Ratings ($T_C = 25^\circ C$ unless otherwise noted)

Parameter	Symbol	Limit	Unit
Drain-Source Voltage	V_{DS}	-100	V
Gate-Source Voltage	V_{GS}	± 20	V
Drain Current-Continuous	I_D	-13	A
Drain Current-Continuous($T_C = 100^\circ C$)	$I_D (100^\circ C)$	-9.2	A
Pulsed Drain Current	I_{DM}	-52	A
Maximum Power Dissipation	P_D	40	W
Derating factor		0.27	W/ $^\circ C$
Single pulse avalanche energy ^(Note 5)	E_{AS}	110	mJ
Operating Junction and Storage Temperature Range	T_J, T_{STG}	-55 To 175	$^\circ C$

Thermal Characteristic

Thermal Resistance, Junction_to_Case ^(Note2)	$R_{\theta JC}$	3.75	$^\circ C/W$
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Electrical Characteristics (T_c=25°C unless otherwise noted)

Parameter	Symbol	Condition	Min	Typ	Max	Unit
Off Characteristics						
Drain-Source Breakdown Voltage	BV _{DSS}	V _{GS} =0V, I _D =-250μA	-100	-	-	V
Zero Gate Voltage Drain Current	I _{DSS}	V _{DS} =-100V, V _{GS} =0V	-	-	1	μA
Gate-Body Leakage Current	I _{GSS}	V _{GS} =±20V, V _{DS} =0V	-	-	±10	μA
On Characteristics (Note 3)						
Gate Threshold Voltage	V _{GS(th)}	V _{DS} =V _{GS} , I _D =-250μA	-1	-1.9	-3	V
Drain-Source On-State Resistance	R _{DS(ON)}	V _{GS} =-10V, I _D =-10A	-	170	200	mΩ
Forward Transconductance	g _{FS}	V _{DS} =-5V, I _D =-5A	12	-	-	S
Dynamic Characteristics (Note 4)						
Input Capacitance	C _{iss}	V _{DS} =-50V, V _{GS} =0V, F=1.0MHz	-	1734	-	PF
Output Capacitance	C _{oss}		-	86	-	PF
Reverse Transfer Capacitance	C _{rss}		-	40	-	PF
Switching Characteristics (Note 4)						
Turn-on Delay Time	t _{d(on)}	V _{DD} =-50V, I _D =-10A V _{GS} =-10V, R _{GEN} =9.1Ω	-	12	-	nS
Turn-on Rise Time	t _r		-	52	-	nS
Turn-Off Delay Time	t _{d(off)}		-	28	-	nS
Turn-Off Fall Time	t _f		-	38	-	nS
Total Gate Charge	Q _g	V _{DS} =-50V, I _D =-10A, V _{GS} =-10V	-	33.1	-	nC
Gate-Source Charge	Q _{gs}		-	4.2	-	nC
Gate-Drain Charge	Q _{gd}		-	7.1	-	nC
Drain-Source Diode Characteristics						
Diode Forward Voltage (Note 3)	V _{SD}	V _{GS} =0V, I _S =-10A	-	-	-1.2	V
Diode Forward Current (Note 2)	I _S	-	-	-	-13	A
Reverse Recovery Time	t _{rr}	T _J = 25°C, I _F = -10A di/dt = 100A/μs (Note 3)	-	35	-	nS
Reverse Recovery Charge	Q _{rr}		-	46	-	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 ≤ 10 sec.
3. Pulse Test: Pulse Width ≤ 300μs, Duty Cycle ≤ 2%.
4. Guaranteed by design, not subject to production
5. E_{AS} condition: T_J=25°C, V_{DD}=-50V, V_G=-10V, L=0.5mH, R_g=25Ω

Typical Electrical and Thermal Characteristics (Curves)

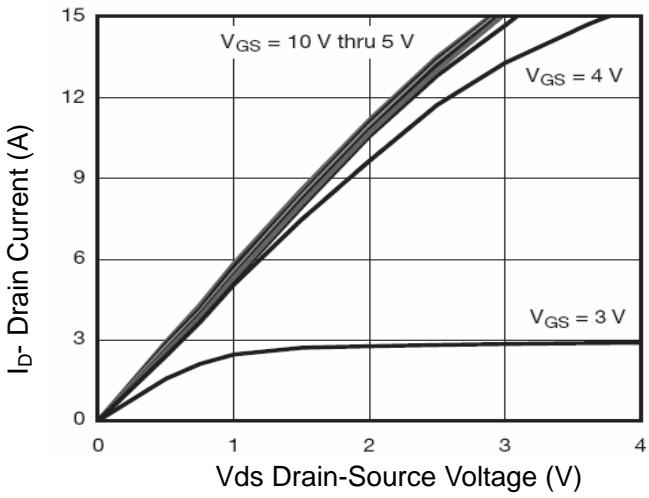


Figure 1 Output Characteristics

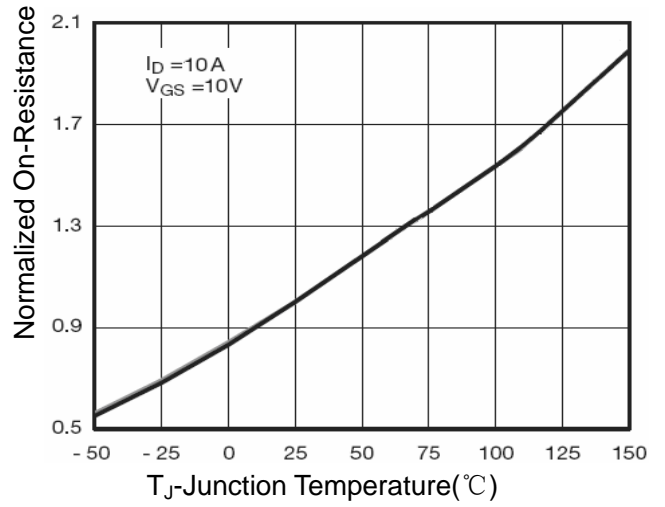


Figure 4 R_{dson} -Junction Temperature

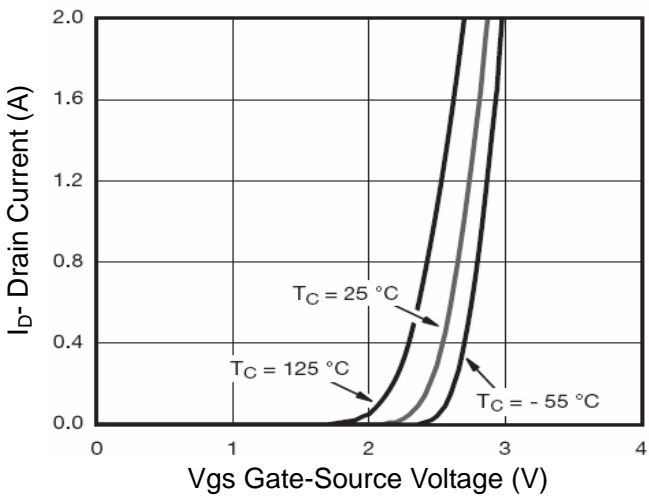


Figure 2 Transfer Characteristics

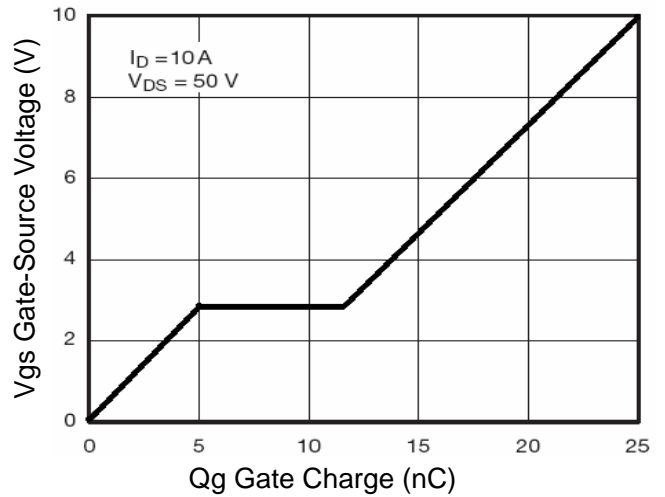


Figure 5 Gate Charge

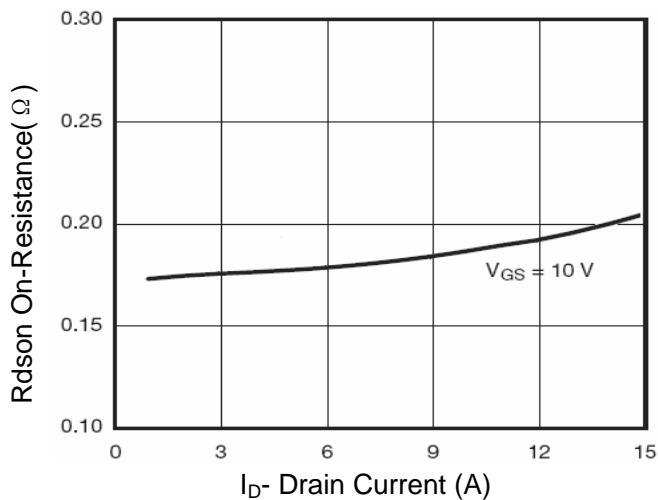


Figure 3 R_{dson} - Drain Current

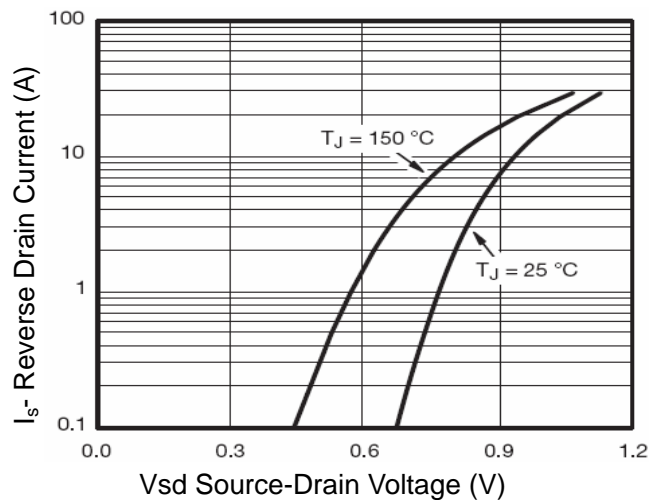


Figure 6 Source- Drain Diode Forward

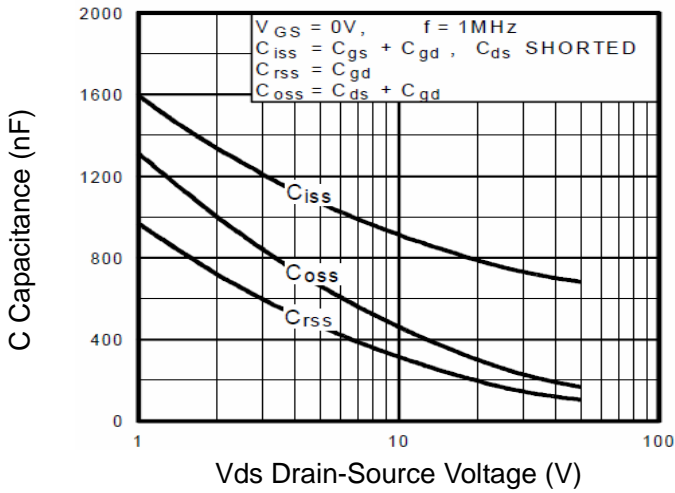


Figure 7 Capacitance vs Vds

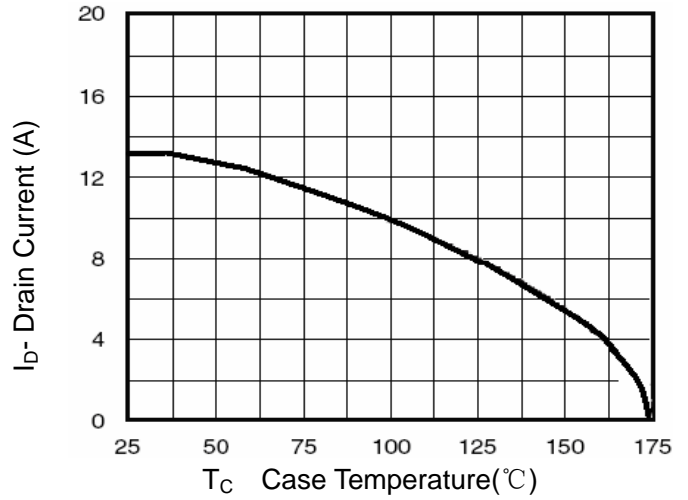


Figure 9 Drain Current vs Case Temperature

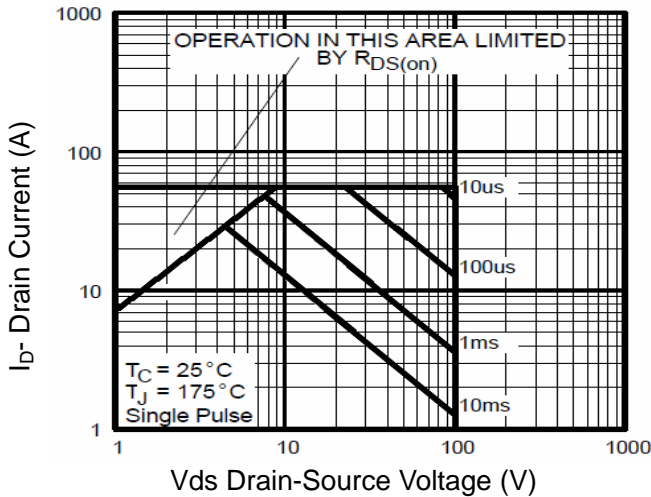


Figure 8 Safe Operation Area

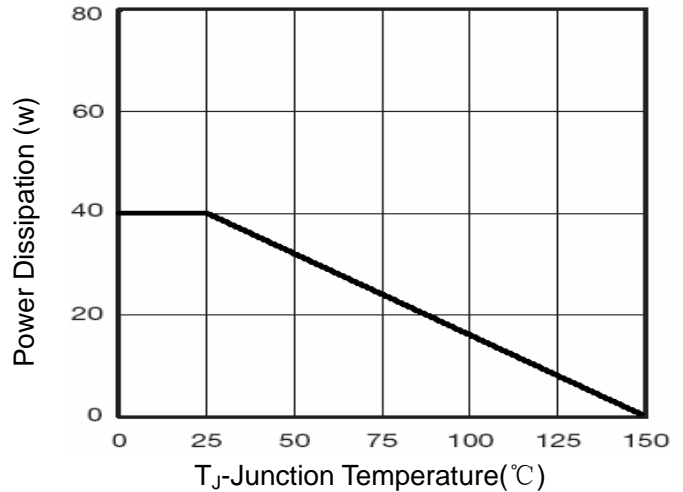


Figure 10 Power De-rating

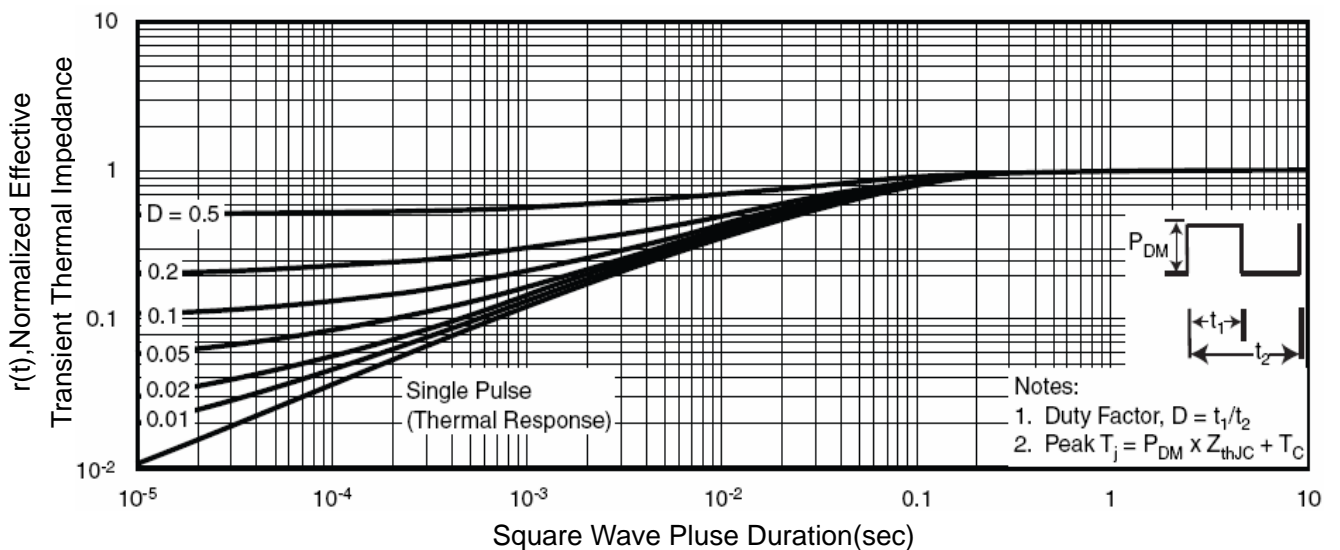
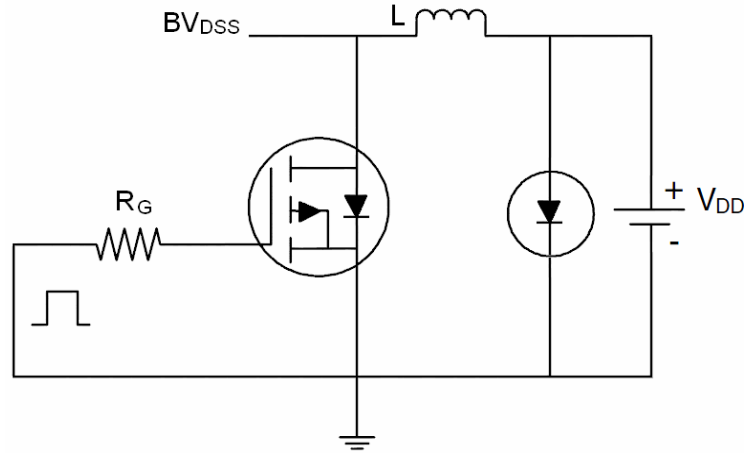


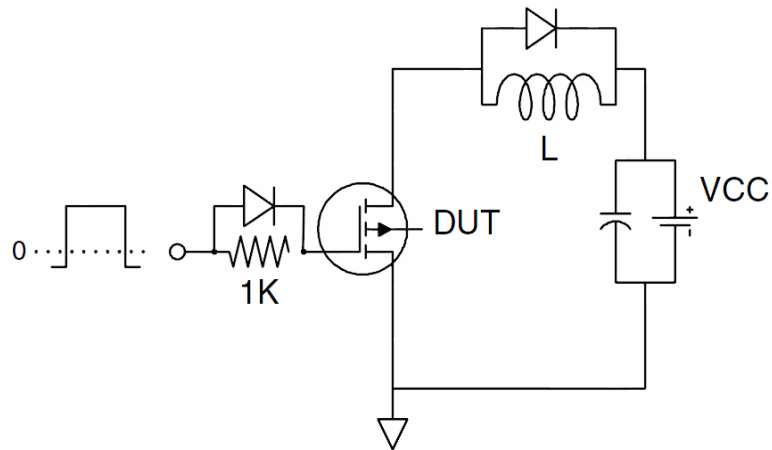
Figure 11 Normalized Maximum Transient Thermal Impedance

Test Circuit

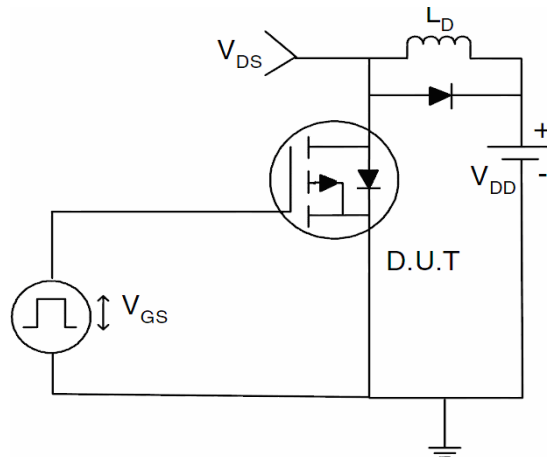
1) E_{AS} Test Circuit



2) Gate Charge Test Circuit



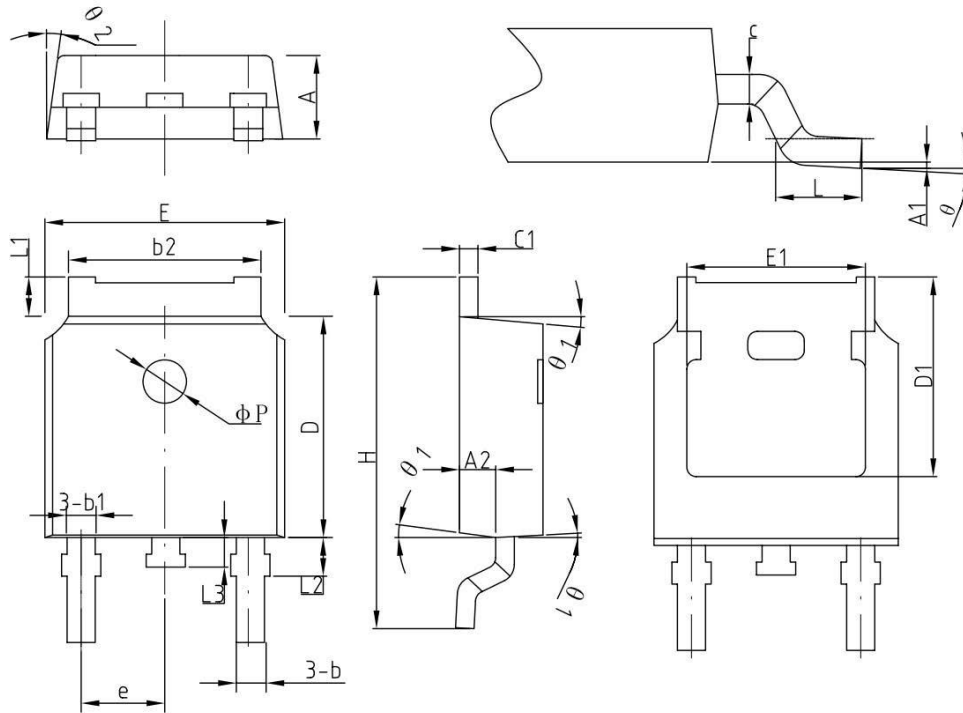
3) Switch Time Test Circuit



Package Dimension

TO-252

Units: mm



COMMON DIMENSIONS
(UNITS OF MEASURE=MILLIMETER)

SYMBOL	MIN	NOM	MAX
A	2.2	2.30	2.38
A1	0	—	0.10
A2	0.90	1.01	1.10
b	0.71	0.76	0.86
b1		0.76	
b2	5.13	5.33	5.46
c	0.47	0.50	0.60
c1	0.47	0.50	0.60
D	6.0	6.10	6.20
D1	—	5.30	—
E	6.50	6.60	6.70
E1	—	4.80	—
e	2.286BSC		
H	9.70	10.10	10.40
L	1.40	1.50	1.70
L1	0.90	—	1.25
L2		1.05	
L3		0.8	
φP		1.2	
θ	0°	—	8°
θ 1	5°	7°	9°
θ 2	5°	7°	9°