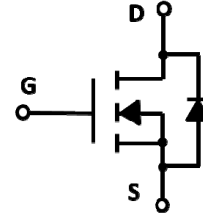


## N-Channel Enhancement Mode Field Effect Transistor

### Product Summary

- $V_{DS}$  60V
- $I_D$  20A
- $R_{DS(ON)}$  ( at  $V_{GS}=10V$ ) <43mohm
- $R_{DS(ON)}$  ( at  $V_{GS}=4.5V$ ) <47 mohm
- 100% UIS Tested
- 100%  $\nabla V_{DS}$  Tested

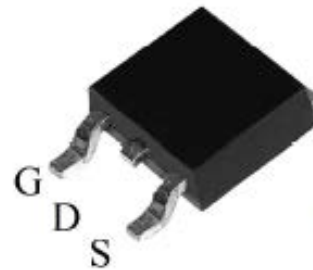


### General Description

- Trench Power MV MOSFET technology
- Excellent package for heat dissipation
- High density cell design for low  $R_{DS(ON)}$

### Applications

- DC-DC Converters
- Power management functions
- Backlighting



TO-252

### ■ Absolute Maximum Ratings ( $T_A=25^\circ\text{C}$ unless otherwise noted)

Parameter	Symbol	Limit	Unit
Drain-source Voltage	$V_{DS}$	60	V
Gate-source Voltage	$V_{GS}$	$\pm 20$	V
Drain Current	$I_D$	$T_C=25^\circ\text{C}$	20
		$T_C=100^\circ\text{C}$	14
Pulsed Drain Current <sup>A</sup>	$I_{DM}$	60	A
Total Power Dissipation	$P_D$	$T_C=25^\circ\text{C}$	34
		$T_C=100^\circ\text{C}$	17
Single Pulse Avalanche Energy <sup>B</sup>	$E_{AS}$	20	mJ
Thermal Resistance Junction-to-Case <sup>C</sup>	$R_{\theta JC}$	4.4	$^\circ\text{C}/\text{W}$
Junction and Storage Temperature Range	$T_J, T_{STG}$	-55~+175	$^\circ\text{C}$

## ■ Electrical Characteristics (T<sub>J</sub>=25°C unless otherwise noted)

Parameter	Symbol	Conditions	Min	Typ	Max	Units
<b>Static Parameter</b>						
Drain-Source Breakdown Voltage	BV <sub>DSS</sub>	V <sub>GS</sub> = 0V, I <sub>D</sub> =250μA	60			V
Zero Gate Voltage Drain Current	I <sub>DSS</sub>	V <sub>DS</sub> =60V, V <sub>GS</sub> =0V	T <sub>J</sub> =25°C		1	μA
			T <sub>J</sub> =55°C		5	
Gate-Body Leakage Current	I <sub>GSS</sub>	V <sub>GS</sub> = ±20V, V <sub>DS</sub> =0V			±100	nA
Gate Threshold Voltage	V <sub>GS(th)</sub>	V <sub>DS</sub> = V <sub>GS</sub> , I <sub>D</sub> =250μA	1.0	1.5	2.5	V
Static Drain-Source On-Resistance	R <sub>DS(on)</sub>	V <sub>GS</sub> = 10V, I <sub>D</sub> =20A		34	43	mΩ
		V <sub>GS</sub> = 4.5V, I <sub>D</sub> =10A		36	47	
Diode Forward Voltage	V <sub>SD</sub>	I <sub>S</sub> =10A, V <sub>GS</sub> =0V		0.8	1.2	V
Maximum Body-Diode Continuous Current	I <sub>S</sub>				20	A
<b>Dynamic Parameters</b>						
Input Capacitance	C <sub>iss</sub>	V <sub>DS</sub> =30V, V <sub>GS</sub> =0V, f=1MHz		800		pF
Output Capacitance	C <sub>oss</sub>			68		
Reverse Transfer Capacitance	C <sub>rss</sub>			36		
<b>Switching Parameters</b>						
Total Gate Charge	Q <sub>g</sub>	V <sub>GS</sub> =10V, V <sub>DS</sub> =30V, I <sub>D</sub> =10A		15		nC
Gate-Source Charge	Q <sub>gs</sub>			2.4		
Gate-Drain Charge	Q <sub>gd</sub>			2.5		
Reverse Recovery Charge	Q <sub>rr</sub>	I <sub>F</sub> =20A, di/dt=500A/us		23		
Reverse Recovery Time	t <sub>rr</sub>			45		
Turn-on Delay Time	t <sub>D(on)</sub>	V <sub>GS</sub> =10V, V <sub>DD</sub> =30V, I <sub>D</sub> =2A, R <sub>L</sub> =1Ω R <sub>GEN</sub> =3Ω		5		ns
Turn-on Rise Time	t <sub>r</sub>			39		
Turn-off Delay Time	t <sub>D(off)</sub>			19		
Turn-off fall Time	t <sub>f</sub>			7		

## Typical Performance Characteristics

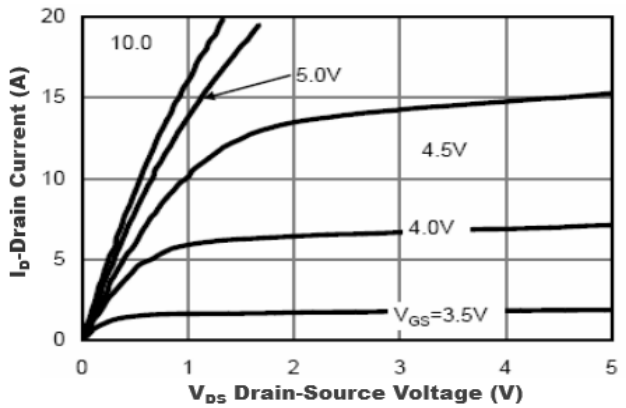


Figure1. Output Characteristics

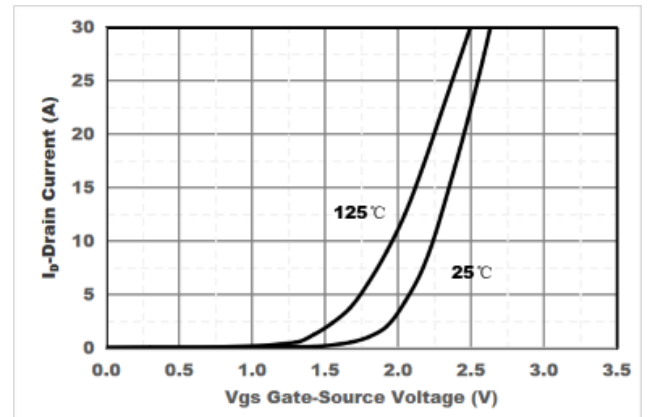


Figure2. Transfer Characteristics

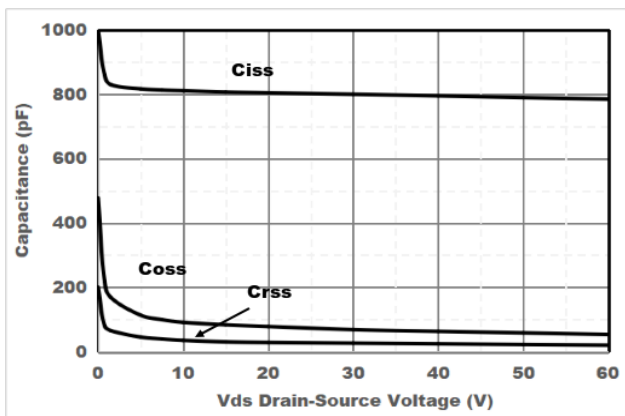


Figure3. Capacitance Characteristics

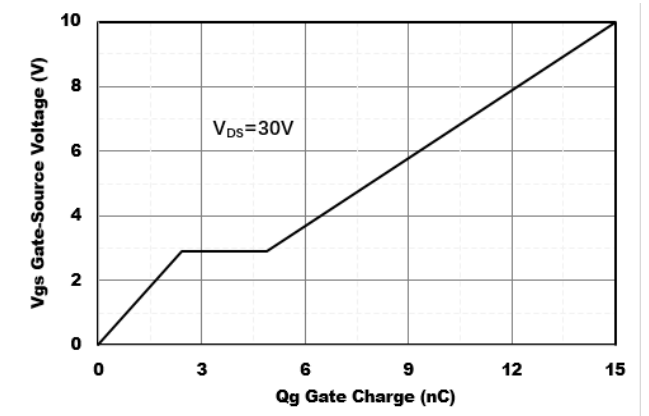


Figure4. Gate Charge

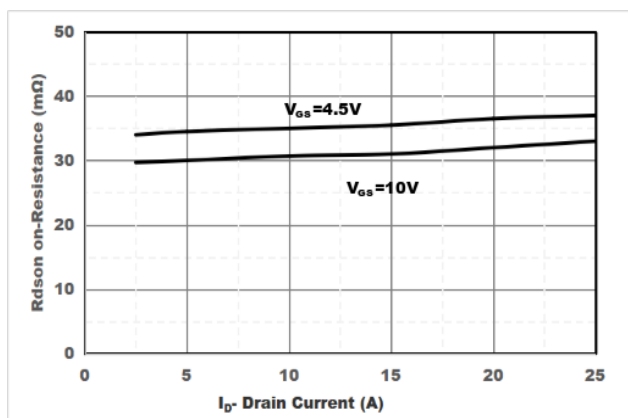


Figure5. Drain-Source on Resistance

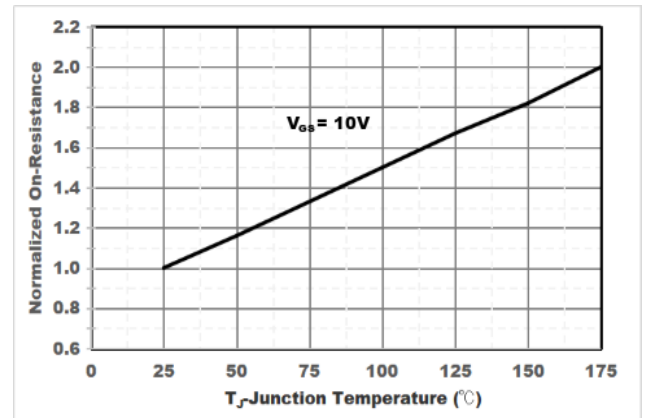


Figure6. Drain-Source on Resistance

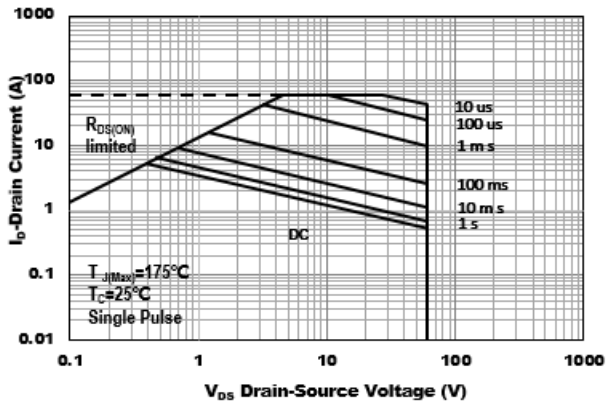


Figure7. Safe Operation Area

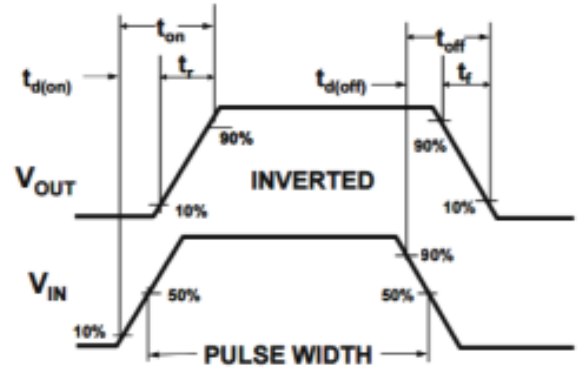
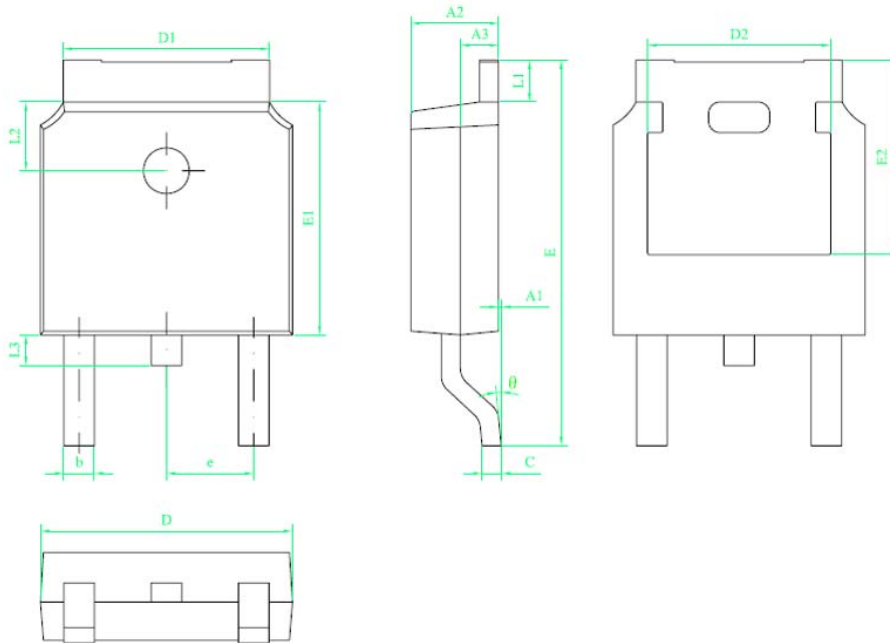


Figure8. Switching wave

## ■ TO-252 Package Information



Symbol	(mm)		
	min	nom	max
A1	0	---	0.10
A2	2.20	2.30	2.40
A3	0.90	1.00	1.10
b	0.75	---	0.85
c	0.50	---	0.60
D	6.50	6.60	6.70
D1	5.30	5.40	5.50
D2	4.70	4.80	4.90
E	9.90	10.10	10.30
E1	6.00	6.10	6.20
E2	5.20	5.30	5.40
e	2.20	2.286	2.40
L1	0.90	---	1.25
L2	1.70	1.80	1.90
L3	0.60	0.80	1.00
$\theta$	0°	---	8°

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