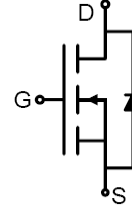


**65V/50A N-Channel MOSFET**
**Features**

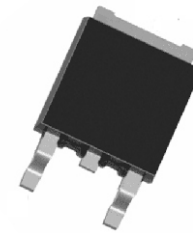
- 65V, 50A,  $R_{DS(ON),max.} = 18m\Omega @ V_{GS}=10V$
- Reliable and Rugged
- Advanced trench process technology High Density Cell Design For Ultra Low On-Resistance


**Application**

- Battery protection
- Power management

**Product Summary**

$V_{DS}$	65V
$R_{DS(on),max@VGS=10V}$	18m $\Omega$
$I_D$	50A



TO-252

**Maximum Ratings**

Parameter	Symbol	Value	Unit
Drain-source voltage	$V_{DS}$	65	V
Continuous drain current $T_C = 25^\circ C$ (Silicon limit) $T_C = 25^\circ C$ (Package limit) $T_C = 100^\circ C$ (Silicon limit)	$I_D$	- 50 35.5	A
Pulsed drain current $T_C = 25^\circ C, t_p$ limited by $T_{jmax}$	$I_{D\ pulse}$	155	
Avalanche energy, single pulse ( $L=0.5mH, R_g=25\Omega$ )	$E_{AS}$	150	mJ
Gate-emitter voltage	$V_{GS}$	$\pm 20$	V
Power dissipation $T_C = 25^\circ C$	$P_{tot}$	120	W
Operating junction and storage temperature	$T_j, T_{stg}$	-55~150	$^\circ C$

**Thermal Resistance**

Parameter	Symbol	Value	Unit
Thermal resistance, junction – case. Max	$R_{thJC}$	0.75	°C/W
Thermal resistance, junction – ambient. Max	$R_{thJA}$	42	

**Electrical Characteristic, at  $T_j = 25\text{ }^\circ\text{C}$ , unless otherwise specified**

Parameter	Symbol	Test Condition	Value			Unit
			min.	typ.	max.	

**Static Characteristic**

Drain-source breakdown voltage	$V_{(BR)DSS}$	$V_{GS}=0V, I_D=250\mu A$	65	-	-	V
Gate threshold voltage	$V_{GS(th)}$	$V_{DS}=V_{GS}, I_D=250\mu A$ $T_j=25^\circ\text{C}$ $T_j=125^\circ\text{C}$	1.2	1.8	2.5	
Zero gate voltage drain current	$I_{DSS}$	$V_{DS}=68V, V_{GS}=0V$ $T_j=25^\circ\text{C}$ $T_j=125^\circ\text{C}$	-	-	1	$\mu A$
Gate-source leakage current	$I_{GSS}$	$V_{GS}=20V, V_{DS}=0V$	-100	-	100	nA
Drain-source on-state resistance	$R_{DS(on)}$	$V_{GS}=10V, I_D=20A,$ $T_j=25^\circ\text{C}$	-	13.5	18	m $\Omega$
Transconductance	$g_{fs}$	$V_{DS}=10V, I_D=20A$	-	100	-	S

**Dynamic Characteristic**

Input Capacitance	$C_{iss}$	$V_{GS}=0V, V_{DS}=25V,$ $f=1\text{MHz}$	-	3250	-	pF
Output Capacitance	$C_{oss}$		-	370	-	
Reverse Transfer Capacitance	$C_{rss}$		-	280	-	
Gate Total Charge	$Q_G$	$V_{GS}=10V, V_{DS}=25V,$ $I_D=20A, f=1\text{MHz}$	-	90	-	nC
Gate-Source charge	$Q_{gs}$		-	15	-	
Gate-Drain charge	$Q_{gd}$		-	35	-	
Turn-on delay time	$t_{d(on)}$	$T_j=25^\circ\text{C}, V_{DD}=25V,$ $I_{DS}=20A, R_L=6\Omega$	-	18	-	ns
Rise time	$t_r$		-	15	-	
Turn-off delay time	$t_{d(off)}$		-	22	-	
Fall time	$t_f$		-	9	-	
Gate resistance	$R_G$	$V_{GS}=0V, V_{DS}=0V,$ $f=1\text{MHz}$	-	2.2	-	$\Omega$

**Body Diode Characteristic**

Body Diode Forward Voltage	$V_{SD}$	$V_{GS}=0V, I_{SD}=20A$	-	0.8	1.2	V
Body Diode Reverse Recovery Time	$t_{rr}$	$I_{SD}=20A,$ $dI/dt=100A/\mu s$	-	35	-	ns
Body Diode Reverse Recovery Charge	$Q_{rr}$		-	60	-	nC

## Typical Performance Characteristics

Figure 1: Power Dissipation

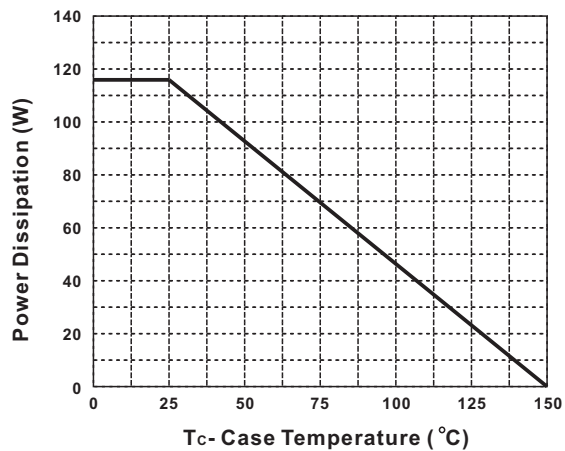


Figure 2: Drain Current

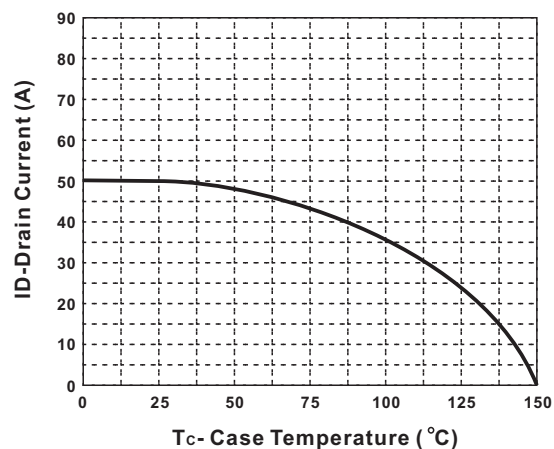


Figure 3: Safe Operation Area

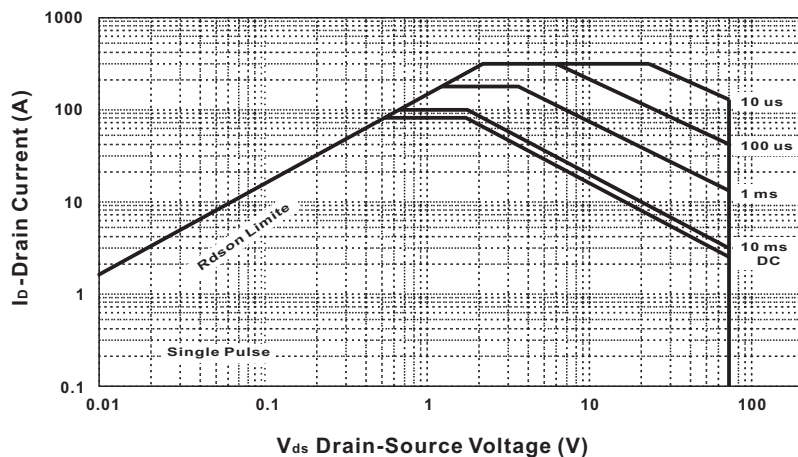


Figure 4: Thermal Transient Impedance

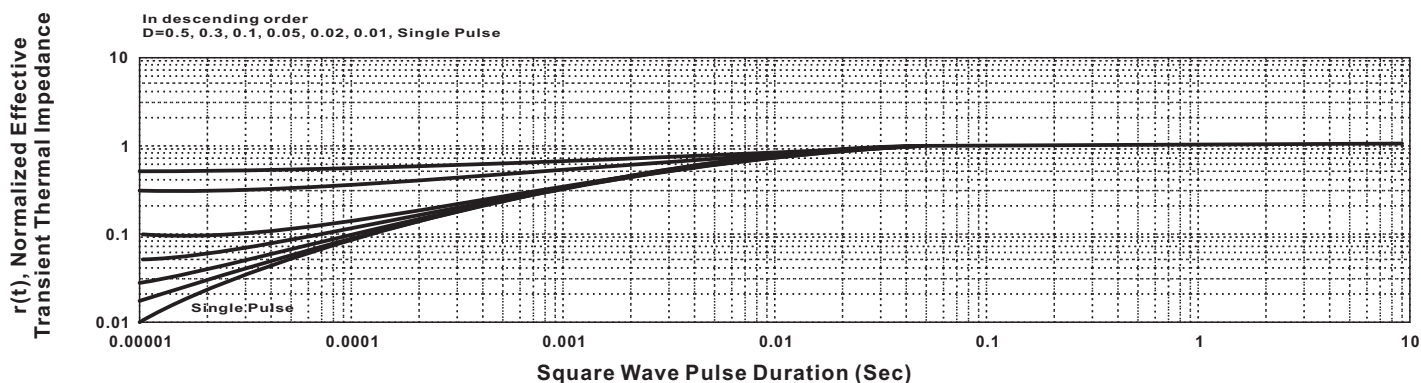


Figure 5: Output Characteristics

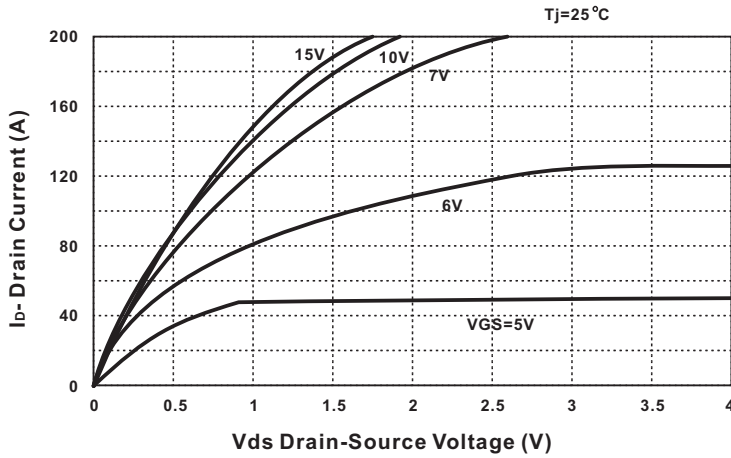


Figure 6: Drain-Source On Resistance

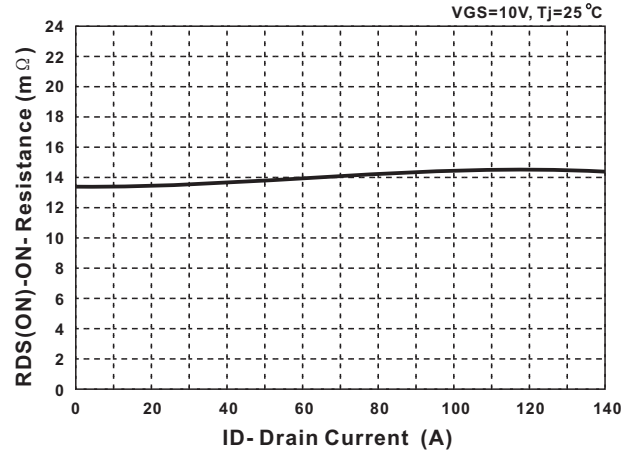


Figure 7: On-Resistance vs. Temperature

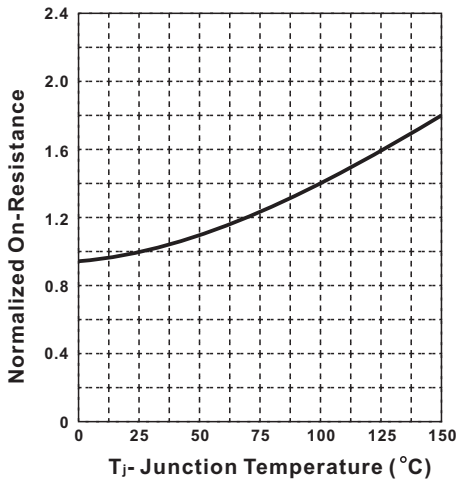


Figure 8: Source-Drain Diode Forward

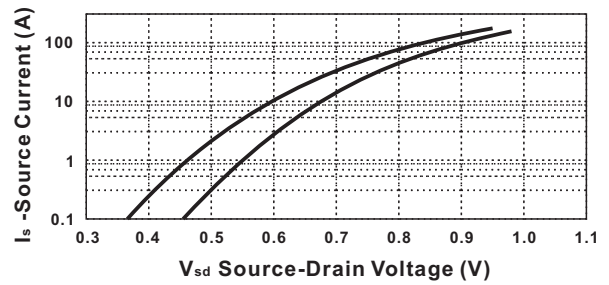


Figure 9: Capacitance Characteristics

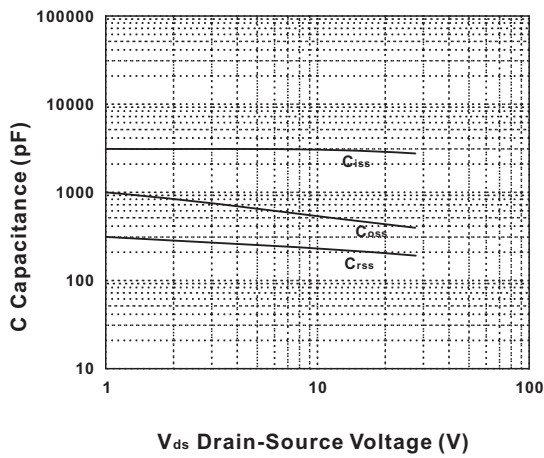
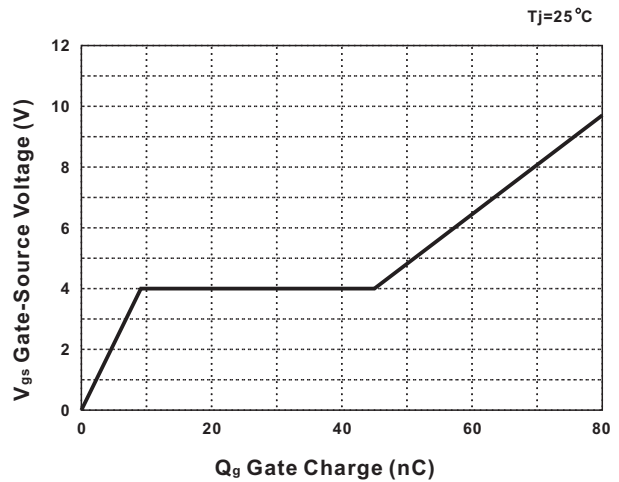
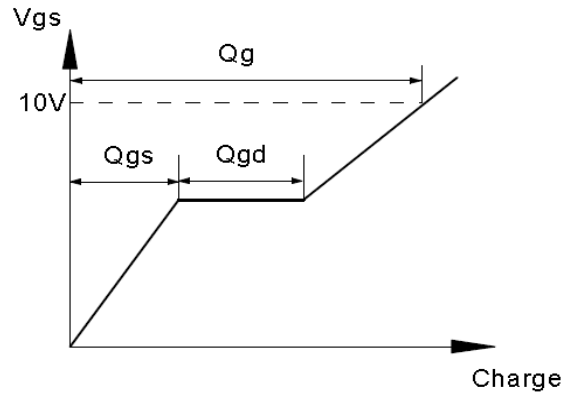
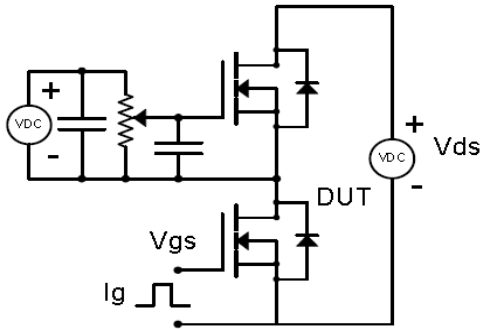


Figure 10: Gate Charge Characteristics

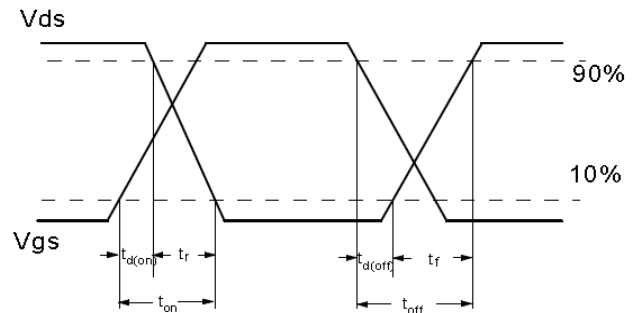
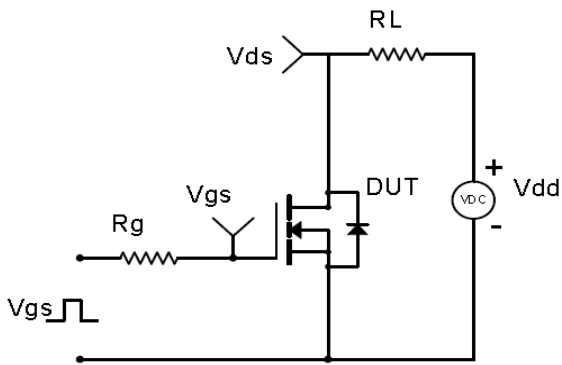


## Test Circuit & Waveform

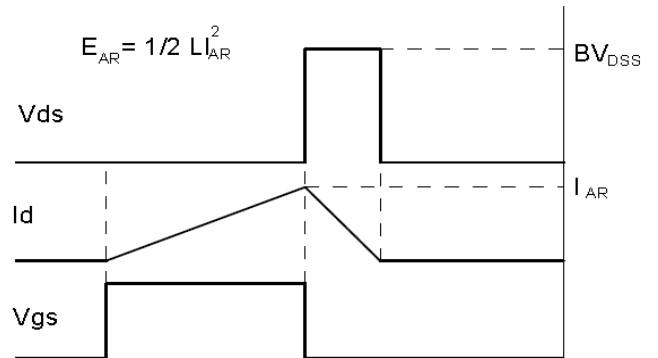
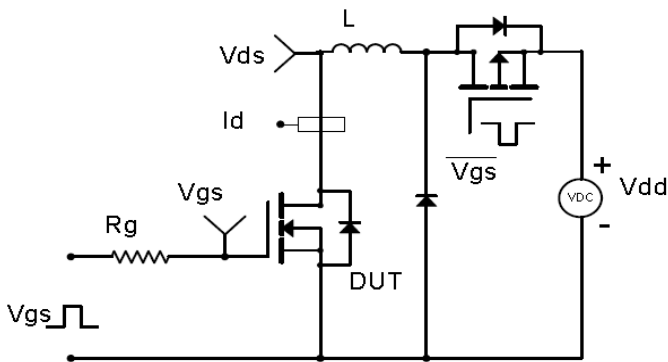
### Gate Charge Test Circuit & Waveform



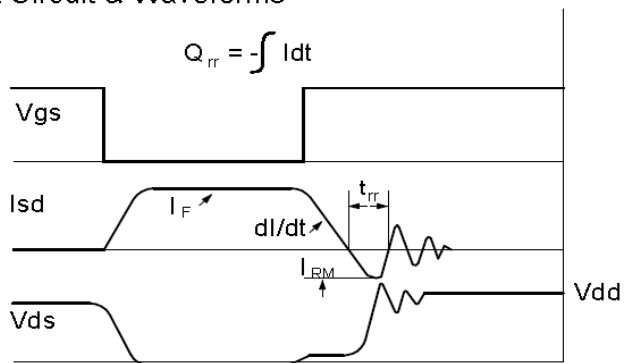
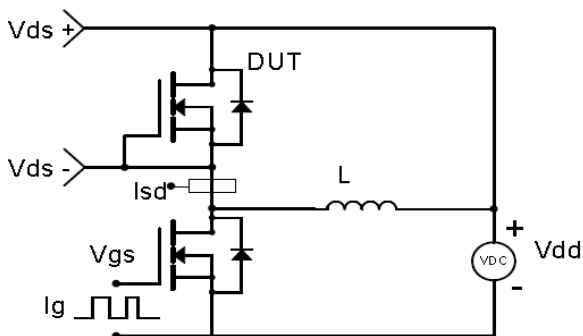
### Resistive Switching Test Circuit & Waveforms



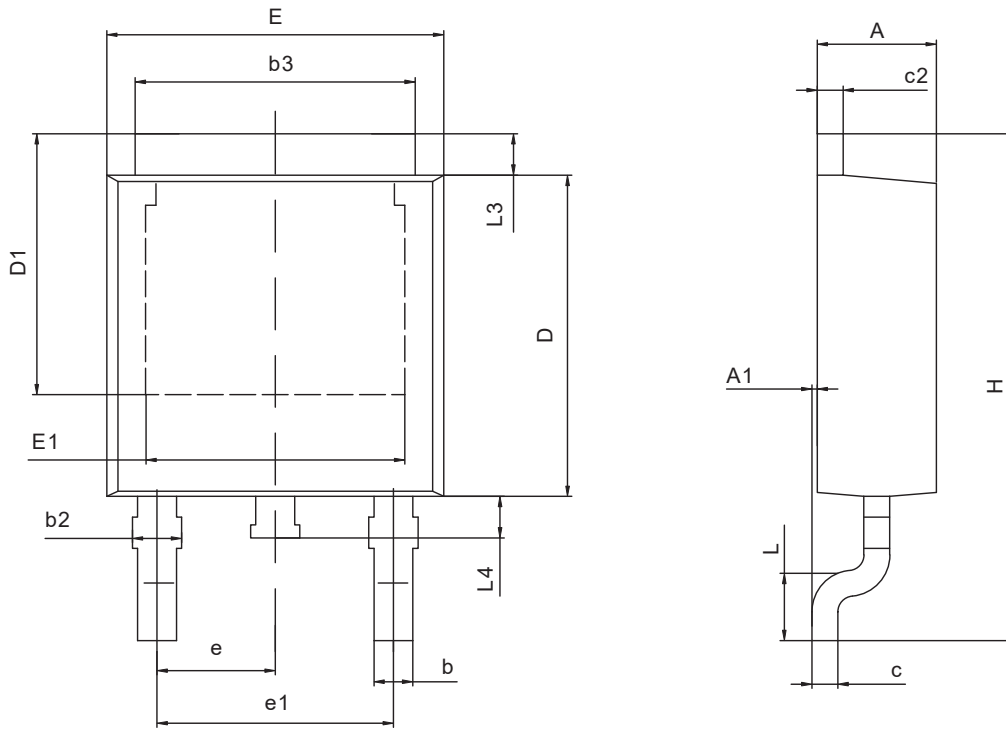
### Unclamped Inductive Switching (UIS) Test Circuit & Waveforms



### Diode Recovery Test Circuit & Waveforms



### TO-252 Package Information



Dimension	Millimeters	
	Min.	Max.
A	2.16	2.41
A1	0.00	0.15
b	0.64	0.89
b2	0.65	1.15
b3	4.95	5.50
c	0.46	0.61
c2	0.40	0.98
D	5.97	6.22
D1	5.02	5.84
E	6.35	6.73
E1	4.32	5.50
e	2.29 (BSC)	
e1	4.57	
H	9.40	10.48
L	1.18	1.78
L3	0.89	1.27
L4	0.51	1.02

### Revision history

Date	Revision	Changes
28-May-2020	1.0	Initial release

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