

The GreenMOS<sup>®</sup> high voltage MOSFET utilizes charge balance technology to achieve outstanding low on-resistance and lower gate charge. It is engineered to minimize conduction loss, provide superior switching performance and robust avalanche capability.

The GreenMOS<sup>®</sup> Generic series is optimized for extreme switching performance to minimize switching loss. It is tailored for high power density applications to meet the highest efficiency standards.

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Parameter	Value	Unit
$V_{DS, min} @ T_{j(max)}$	700	V
$I_{D, pulse}$	12	A
$R_{DS(ON), max} @ V_{GS}=10V$		

**Absolute Maximum Ratings** at  $T_j=25$  unless otherwise noted

Parameter	Symbol	Value	Unit
Drain-source voltage	$V_{DS}$	650	V
Gate-source voltage	$V_{GS}$	$\pm 30$	V
Continuous drain current <sup>1)</sup> , $T_C=25$ °C	$I_D$	4	A
Continuous drain current <sup>1)</sup> , $T_C=100$ °C		2.5	
Pulsed drain current <sup>2)</sup> , $T_C=25$ °C	$I_{D, pulse}$	12	A
Continuous diode forward current <sup>1)</sup> , $T_C=25$ °C	$I_S$	4	A
Diode pulsed current <sup>2)</sup> , $T_C=25$ °C	$I_{S, pulse}$	12	A
Power dissipation <sup>3)</sup> , $T_C=25$ °C	$P_D$	28.4	W
Single pulsed avalanche energy <sup>5)</sup>	$E_{AS}$	112	mJ
MOSFET dv/dt ruggedness, $V_{DS}$	dv/dt	50	V/ns
Reverse diode dv/dt, $V_{DS}$	dv/dt	15	V/ns
Operation and storage temperature	$T_{stg}, T_j$	-55 to 150	°C

**Thermal Characteristics**

Parameter	Symbol	Value	Unit
Thermal resistance, junction-case	R	4.4	°C/W
Thermal resistance, junction-ambient <sup>4)</sup>	R	62	°C/W

**Electrical Characteristics** at  $T_j=25$  unless otherwise specified

Parameter	Symbol	Min.	Typ.	Max.	Unit	Test condition
Drain-source breakdown voltage	$BV_{DSS}$	650			V	$V_{GS}=0$ V, $I_D=250$ A
		700	770			$V_{GS}=0$ V, $I_D$ , $T_j=150$ °C
Gate threshold voltage	$V_{GS(th)}$	2.0		4.0	V	$V_{DS}=V_{GS}$ , $I_D=250$ A
Drain-source on-state resistance	$R_{DS(on)}$		1.2	1.4		$V_{GS}=10$ V, $I_D=2$ A
			2.9			$V_{GS}=10$ V, $I_D=2$ A, $T_j=150$ °C
Gate-source leakage current	$I_{GSS}$			100	nA	$V_{GS}=30$ V
				-100		$V_{GS}=-30$ V
Drain-source leakage current	$I_{DSS}$			1	A	$V_{DS}=650$ V, $V_{GS}=0$ V

### Dynamic Characteristics

Parameter	Symbol	Min.	Typ.	Max.	Unit	Test condition
Input capacitance	$C_{iss}$		259.9		pF	$V_{GS}=0\text{ V}$ , $V_{DS}=50\text{ V}$ , Hz
Output capacitance	$C_{oss}$		21.1		pF	
Reverse transfer capacitance	$C_{rss}$		0.9		pF	
Turn-on delay time	$t_{d(on)}$		30.9		ns	$V_{GS}=10\text{ V}$ , $V_{DS}=380\text{ V}$ , $R_G=25\text{ }\Omega$ ) $I_D=4\text{ A}$
Rise time	$t_r$		20.7		ns	
Turn-off delay time	$t_{d(off)}$		56.3		ns	
Fall time	$t_f$		28.7		ns	

### Gate Charge Characteristics

Parameter	Symbol	Min.	Typ.	Max.	Unit	Test condition
Total gate charge	$Q_g$		6.7		nC	$V_{GS}=10\text{ V}$ , $V_{DS}=400\text{ V}$ , $I_D=4\text{ A}$
Gate-source charge	$Q_{gs}$		1.5		nC	
Gate-drain charge	$Q_{gd}$		3.2		nC	
Gate plateau voltage	$V_{plateau}$		6.4		V	

### Body Diode Characteristics

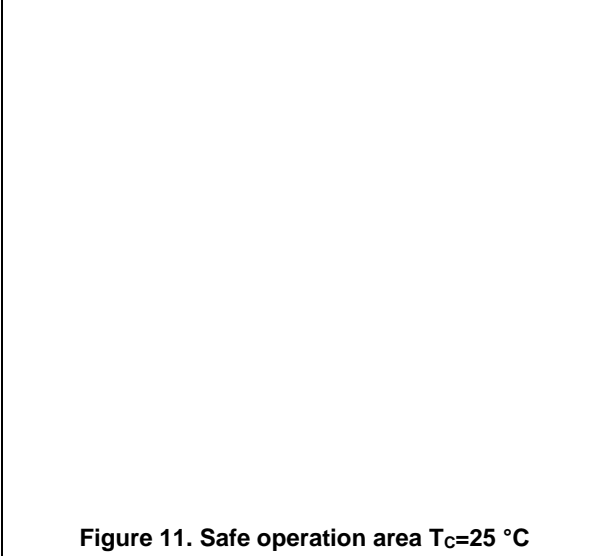
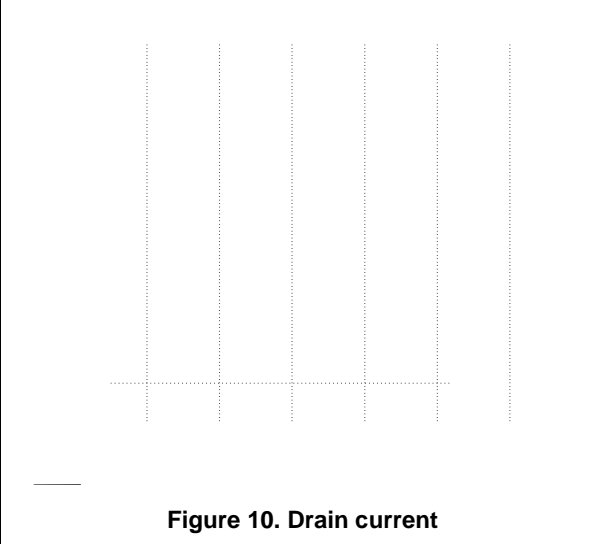
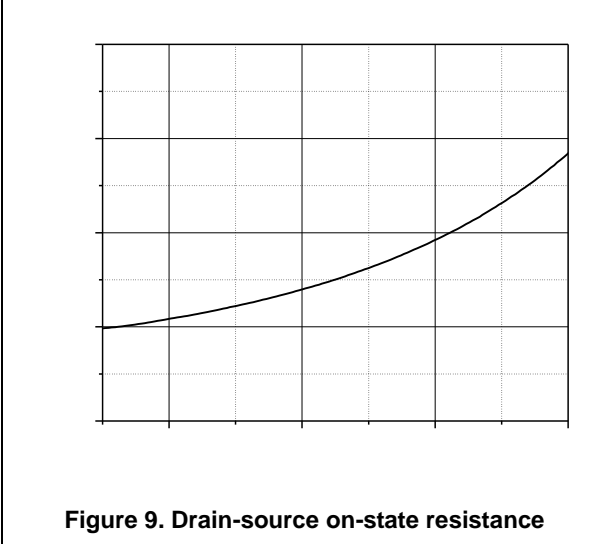
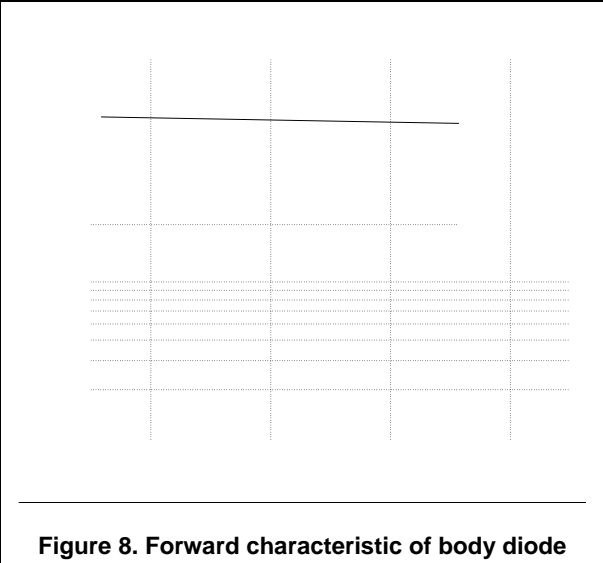
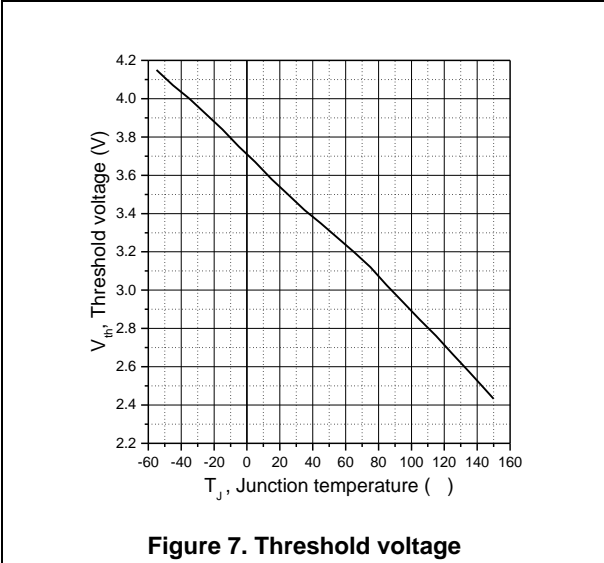
Parameter	Symbol	Min.	Typ.	Max.	Unit	Test condition
Diode forward voltage	$V_{SD}$			1.3	V	$I_S=4\text{ A}$ , $V_{GS}=0\text{ V}$
Reverse recovery time	$t_{rr}$		162		ns	$L=20\text{ mH}$ , $I_S=4\text{ A}$ ,
Reverse recovery charge	$Q_{rr}$		1.2		C	
Peak reverse recovery current	$I_{rrm}$		7		A	

### Note

- 1) Calculated continuous current based on maximum allowable junction temperature.
- 2) Repetitive rating; pulse width limited by max. junction temperature.
- 3)  $P_d$  is based on max. junction temperature, using junction-case thermal resistance.
- 4) The value of  $R_{\theta j-c}$  is measured with the device mounted on 1 in 2 FR-4 board with 2oz. Copper, in a still air environment with  $T_a=25\text{ }^\circ\text{C}$ .
- 5)  $V_{DD}=50\text{ V}$ ,  $V_{GS}=10\text{ V}$ ,  $L=20\text{ mH}$ , starting  $T_j=25\text{ }^\circ\text{C}$ .

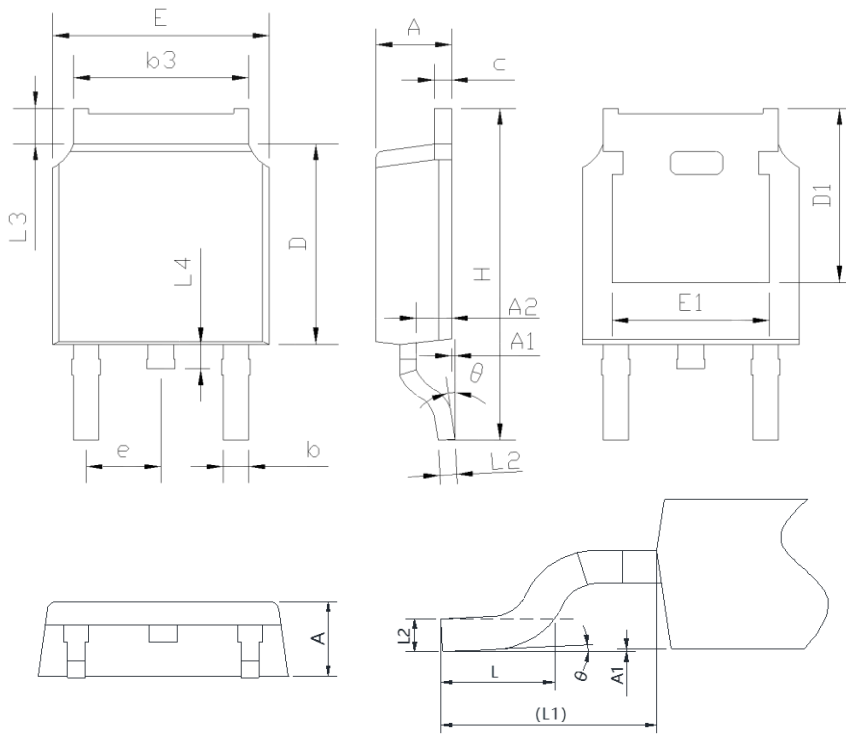
### Electrical Characteristics Diagrams

<p><b>Figure 1. Typ. output characteristics</b></p>	<p><b>Figure 2. Typ. transfer characteristics</b></p>
<p><b>Figure 3. Typ. capacitances</b></p>	<p><b>Figure 4. Typ. gate charge</b></p>
<p><b>Figure 5. Drain-source breakdown voltage</b></p>	<p><b>Figure 6. Drain-source on-state resistance</b></p>





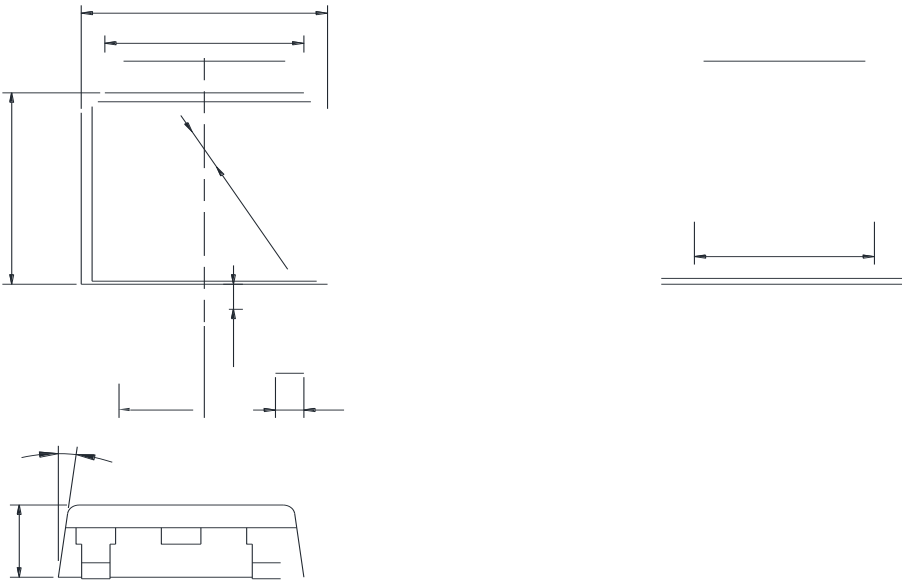
**Package Information**



Symbol	mm		
	Min	Nom	Max
A	2.20	2.30	2.38
A1	0.00	-	0.20
A2	0.97	1.07	1.17
b	0.68	0.78	0.90
b3	5.20	5.33	5.46
c	0.43	0.53	0.61
D	5.98	6.10	6.22
D1	5.30REF		
E	6.40	6.60	6.73
E1	4.63	-	-
e	2.286BSC		
H	9.40	10.10	10.50
L	1.38	1.50	1.75
L1	2.90REF		
L2	0.51BSC		
L3	0.88	-	1.28
L4	0.50	-	1.00
	0	-	

Version1: TO252-C package outline dimension

**Package Information**



Symbol	mm		
	Min	Nom	Max
A	2.20	2.30	2.38
A1	0.00	-	0.10
A2	0.90	1.01	1.10
b	0.72	-	0.85
b1	0.71	0.76	0.81
b2	0.72	-	0.90
b3	5.13	5.33	5.46
c	0.47	-	0.60
c1	0.46	0.51	0.56
c2	0.47	-	0.60
D	6.00	6.10	6.20
D1	5.25	-	-
E	6.50	6.60	6.70
E1	4.70	-	-
e	2.186	2.286	2.386
H	9.80	10.10	10.40
L	1.40	1.50	1.70
L1	2.90 REF		
L2	0.508 BSC		
L3	0.90	-	1.25
L4	0.60	0.80	1.00
L5	0.15	-	0.75
L6	1.80 REF		
	0	-	

Version2: TO252-J package outline dimension



