

The GreenMOS[®] high voltage MOSFET utilizes charge balance technology to achieve outstanding low on-re

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

Parameter	Symbol	Value	Unit
Drain-source voltage	V_{DS}	600	V
Gate-source voltage	V_{GS}	± 30	V
Continuous drain current ¹⁾ , $T_C=25$ °C	I_D	23	A
Continuous drain current ¹⁾ , $T_C=100$ °C		14.5	
Pulsed drain current ²⁾ , $T_C=25$ °C	$I_{D, pulse}$	69	A
Continuous diode forward current ¹⁾ , $T_C=25$ °C	I_S	23	A
Diode pulsed current ²⁾ , $T_C=25$ °C	$I_{S, pulse}$	69	A
Power dissipation ³⁾ , $T_C=25$ °C	P_D	151	W
Single pulsed avalanche energy ⁵⁾	E_{AS}	600	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	0.82	°C/W
Thermal resistance, junction-ambient ⁴⁾	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}	600			V	$V_{GS}=0$ V, $I_D=250$ μ A
		650				$V_{GS}=0$ V, $I_D=250$ μ A, $T_j=150$ °C
Gate threshold voltage	$V_{GS(th)}$	2		4	V	$V_{DS}=V_{GS}$, $I_D=250$ μ A
Drain-source on-state resistance	$R_{DS(on)}$		0.12	0.15		$V_{GS}=10$ V, $I_D=10$ A
			0.29			$V_{GS}=10$ V, $I_D=10$ 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	$V_{DS}=600$ V, $V_{GS}=0$ V

Dynamic Characteristics

Parameter	Symbol	Min.	Typ.	Max.	Unit	Test condition
Input capacitance	C_{iss}		1356		pF	$V_{GS}=0\text{ V}$, $V_{DS}=50\text{ V}$, Hz
Output capacitance	C_{oss}		155		pF	
Reverse transfer capacitance	C_{rss}		2		pF	
Turn-on delay time	$t_{d(on)}$		38.2		ns	$V_{GS}=10\text{ V}$, $V_{DS}=400\text{ V}$, $R_G=25$ $I_D=10\text{ A}$
Rise time	t_r		25.2		ns	
Turn-off delay time	$t_{d(off)}$		79.2		ns	
Fall time	t_f		31.5		ns	

Electrical Characteristics Diagrams

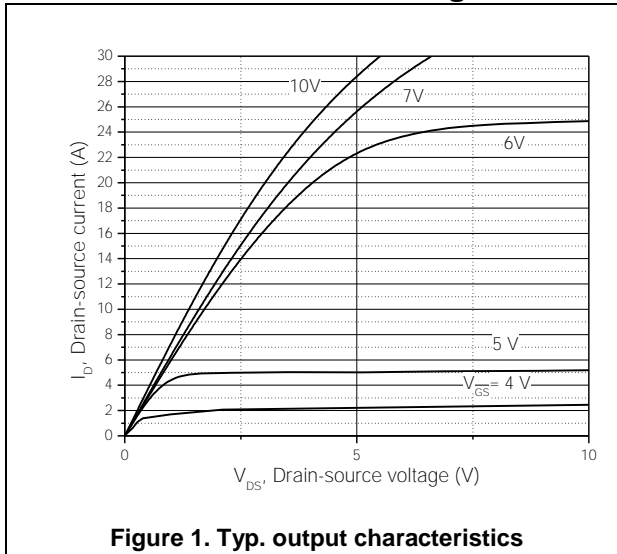


Figure 1. Typ. output characteristics

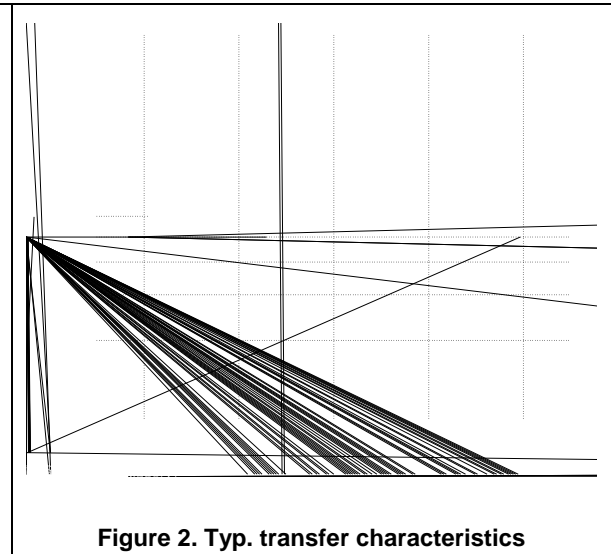


Figure 2. Typ. transfer characteristics

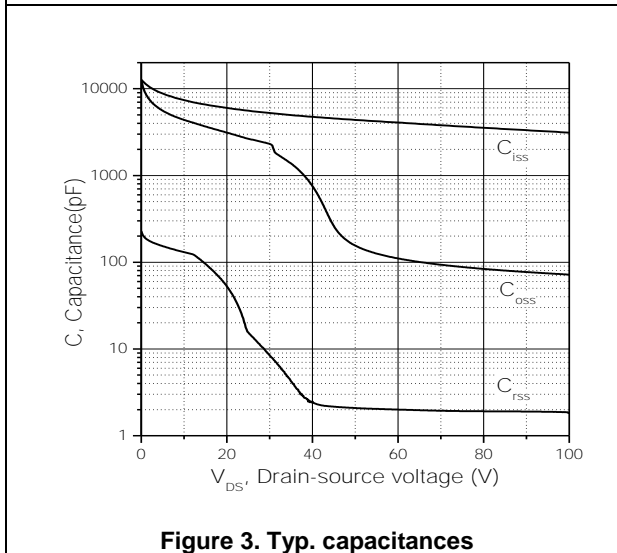


Figure 3. Typ. capacitances

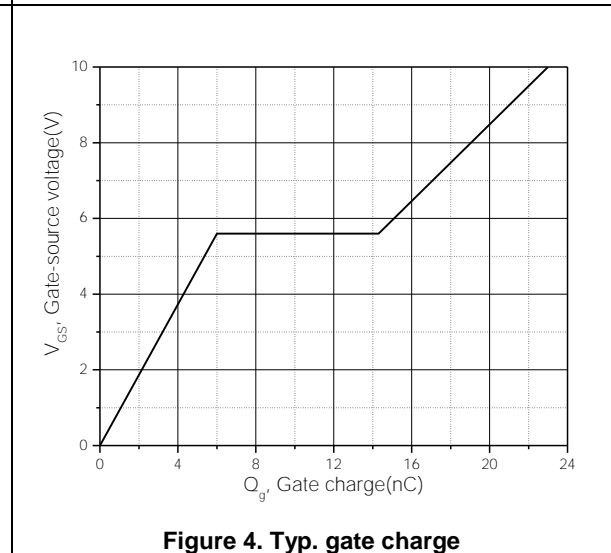


Figure 4. Typ. gate charge

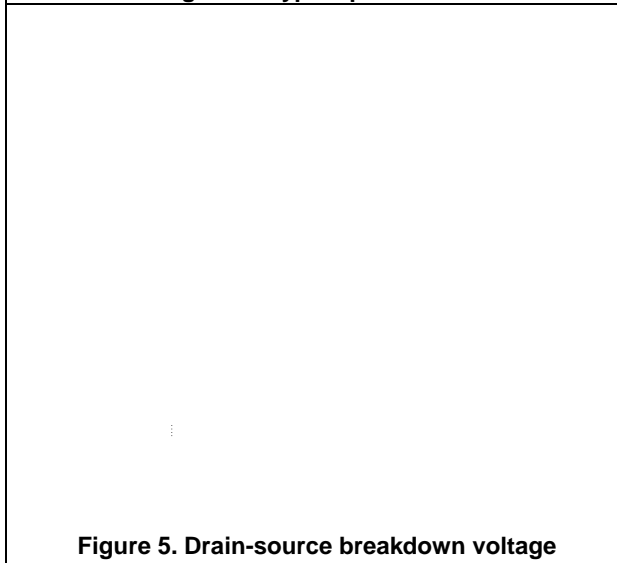


Figure 5. Drain-source breakdown voltage

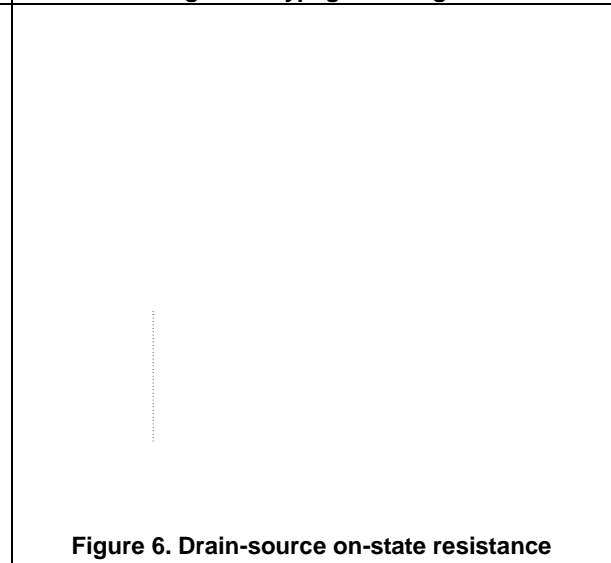


Figure 6. Drain-source on-state resistance

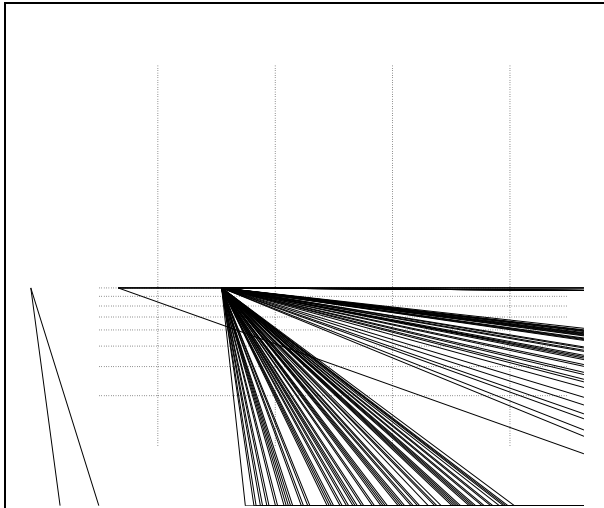


Figure 7. Forward characteristic of body diode

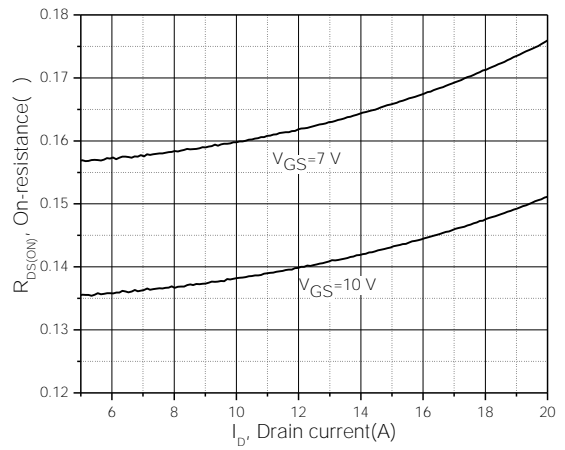


Figure 8. Drain-source on-state resistance

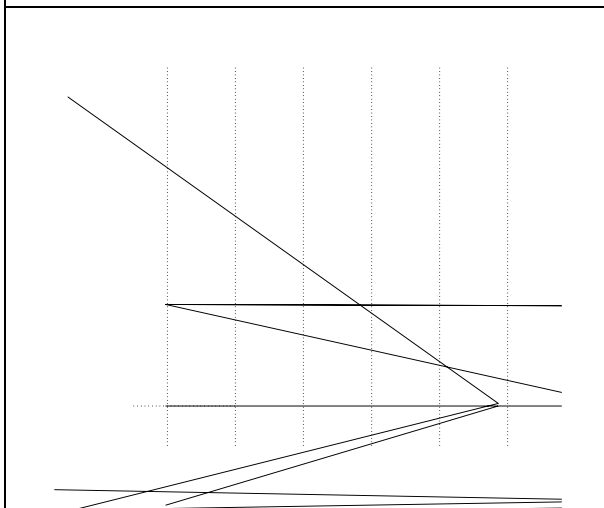


Figure 9. Drain current



Figure 10. Safe operation area $T_C=25\text{ }^\circ\text{C}$

Test circuits and waveforms

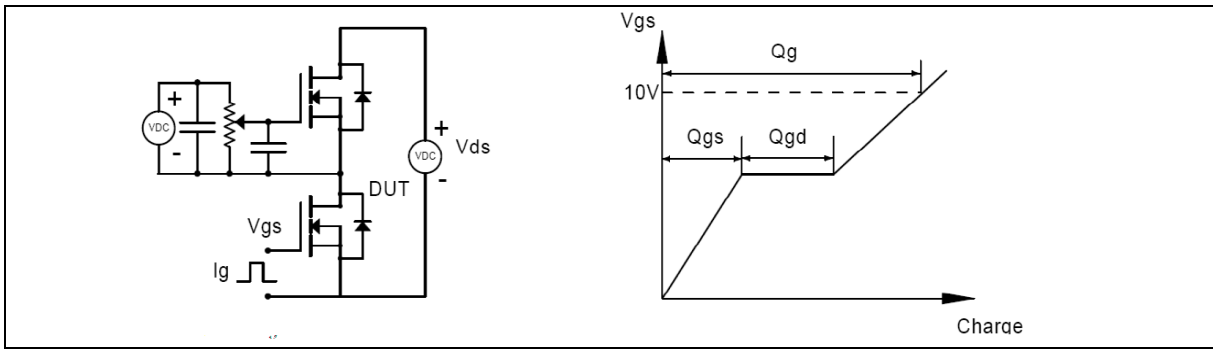


Figure 1. Gate charge test circuit & waveform



Figure 2. Switching time test circuit & waveforms

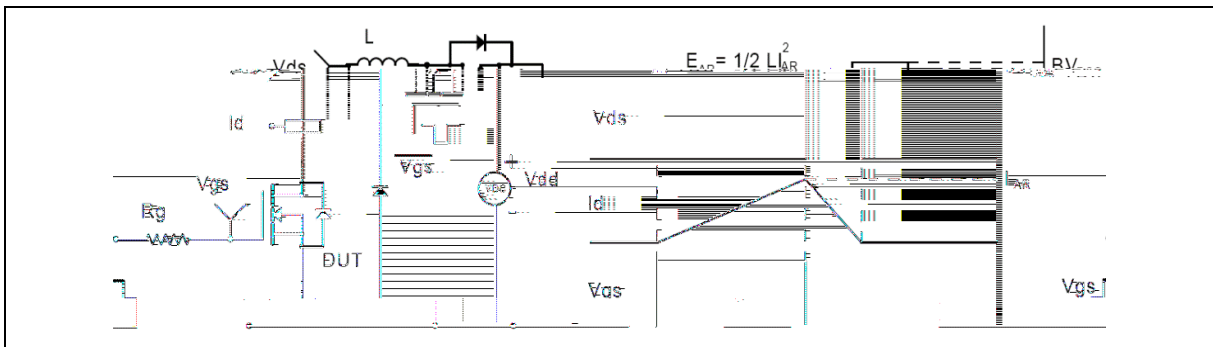


Figure 3. Unclamped inductive switching (UIS) test circuit & waveforms

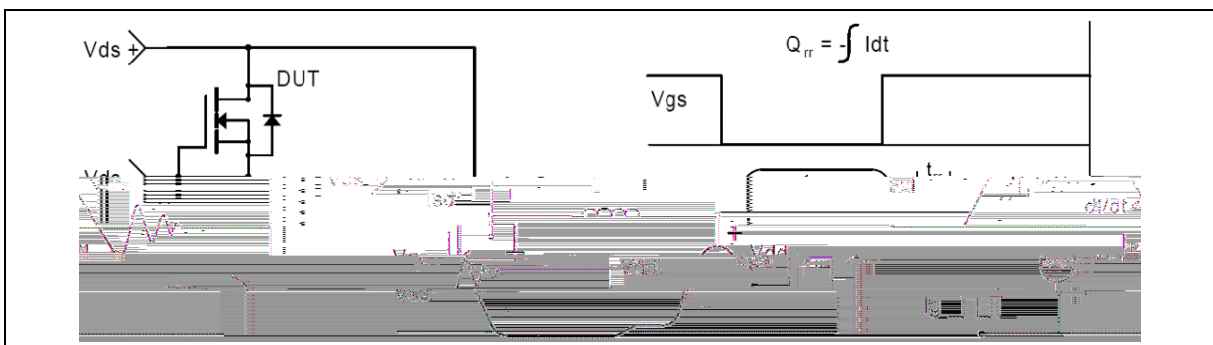
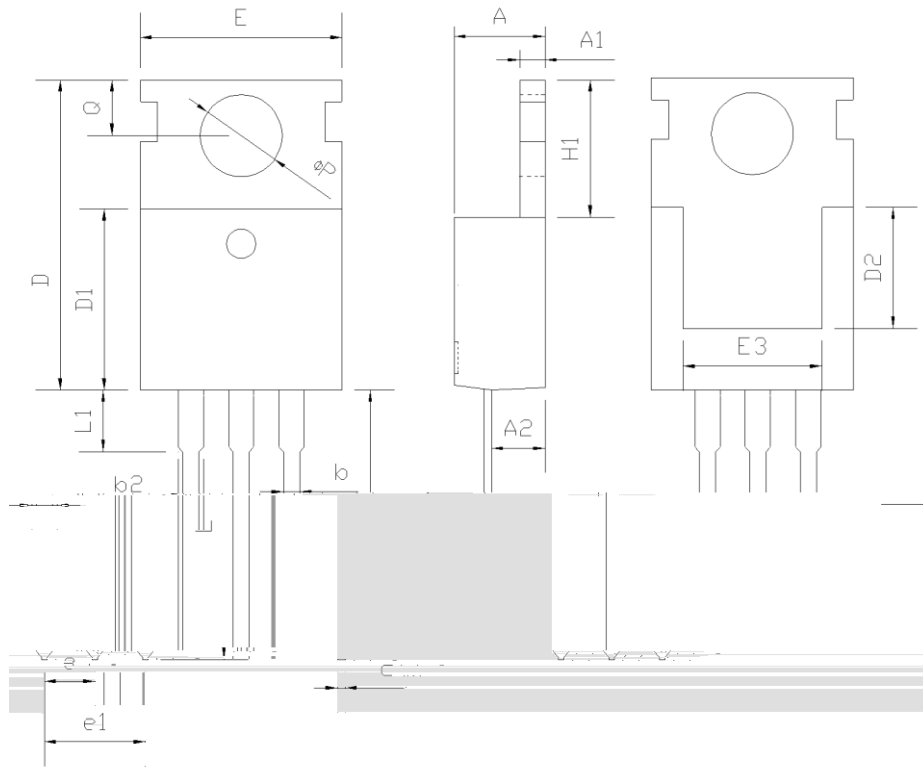


Figure 4. Diode reverse recovery test circuit & waveforms

Package Information



Symbol	mm		
	Min	Nom	Max
A	4.37	4.57	4.77
A1	1.25	1.30	1.45
A2	2.20	2.40	2.60
b	0.70	0.80	0.95
b2	1.17	1.27	1.47
c	0.40	0.50	0.65
D	15.10	15.60	16.10
D1	8.80	9.10	9.40
D2	5.50	-	-
E	9.70	10.00	10.30
E3	7.00	-	-
e	2.54 BSC		
e1	5.08 BSC		
H1	6.25	6.50	6.85
L	12.75	13.50	13.80
L1	-	3.10	3.40
	3.40	3.60	3.80
Q	2.60	2.80	3.00

Version 1: TO220-P outline dimension

