

The GreenMOS[®] 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[®] 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.

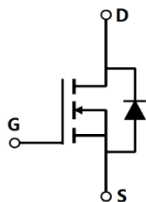
GreenMOS[®]



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Parameter	Value	Unit
$V_{DS, min} @ T_{j(max)}$	700	V
$I_{D, pulse}$	75	A
$R_{DS(ON), max} @ V_{GS}=10V$	125	
Q_g	41.9	nC

Product Name	Package	Marking
OSG65R125KF	TO263	OSG65R125K



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}	± 30	V
Continuous drain current ¹⁾ , $T_C=25$ °C	I_D	25	A
Continuous drain current ¹⁾ , $T_C=100$ °C		16	
Pulsed drain current ²⁾ , $T_C=25$ °C	$I_{D, pulse}$	75	A
Continuous diode forward current ¹⁾ , $T_C=25$ °C	I_S	25	A
Diode pulsed current ²⁾ , $T_C=25$ °C	$I_{S, pulse}$	75	A
Power dissipation ³⁾ , $T_C=25$ °C	P_D	219	W
Single pulsed avalanche energy ⁵⁾	E_{AS}	730	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	0.57	°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}	650			V	$V_{GS}=0$ V, $I_D=1$ mA
		700	740			$V_{GS}=0$ V, $I_D=1$ mA, $T_j=150$ °C
Gate threshold voltage	$V_{GS(th)}$	2.9		3.9	V	$V_{DS}=V_{GS}$, $I_D=1$ mA
Drain-source on-state resistance	$R_{DS(on)}$		0.115	0.125		$V_{GS}=10$ V, $I_D=12.5$ A
			0.278			$V_{GS}=10$ V, $I_D=12.5$ 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}		2390.8		pF	$V_{GS}=0\text{ V}$, $V_{DS}=50\text{ V}$, 00 kHz
Output capacitance	C_{oss}		154.1		pF	
Reverse transfer capacitance	C_{rss}		3.9		pF	
Turn-on delay time	$t_{d(on)}$		32.4		ns	$V_{GS}=10\text{ V}$, $V_{DS}=400\text{ V}$, R_G $I_D=12.5\text{ A}$
Rise time	t_r		30.8		ns	
Turn-off delay time	$t_{d(off)}$		63.2		ns	
Fall time	t_f		4.9		ns	

Gate Charge Characteristics

Parameter	Symbol	Min.	Typ.	Max.	Unit	Test condition
Total gate charge	Q_g		41.9		nC	$V_{GS}=10\text{ V}$, $V_{DS}=400\text{ V}$, $I_D=12.5\text{ A}$
Gate-source charge	Q_{gs}		10.4		nC	
Gate-drain charge	Q_{gd}		14.1		nC	
Gate plateau voltage	$V_{plateau}$		5.7		V	

Body Diode Characteristics

Parameter	Symbol	Min.	Typ.	Max.	Unit	Test condition
Diode forward voltage	V_{SD}			1.4	V	$I_S=25\text{ A}$, $V_{GS}=0\text{ V}$
Reverse recovery time	t_{rr}		365.2		ns	$I_S=12.5\text{ A}$,
Reverse recovery charge	Q_{rr}		4.7		C	
Peak reverse recovery current	I_{rrm}		24.9		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_{θ} 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) $V_{DD}=100\text{ V}$, $V_{GS}=10\text{ V}$, $L=80\text{ mH}$, starting $T_j=25\text{ }^\circ\text{C}$.

Electrical Characteristics Diagrams

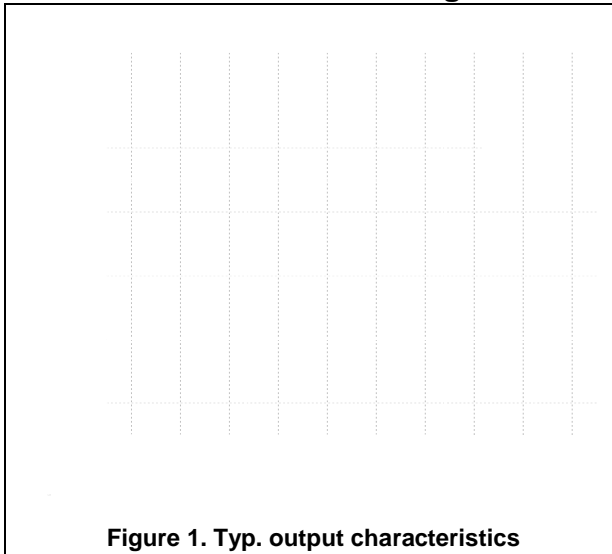


Figure 1. Typ. output characteristics

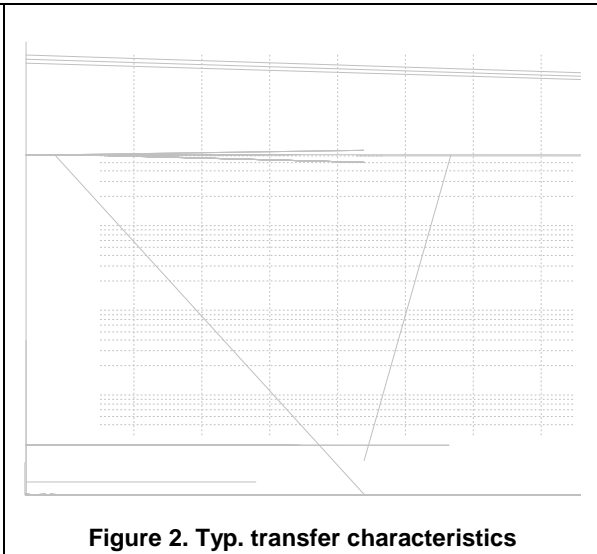


Figure 2. Typ. transfer characteristics

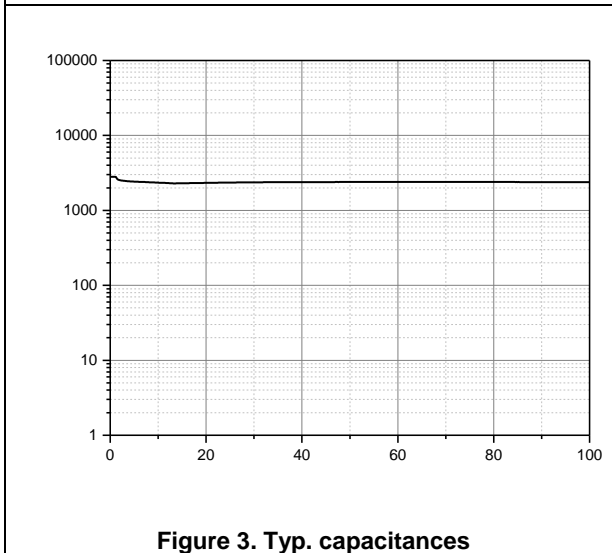


Figure 3. Typ. capacitances

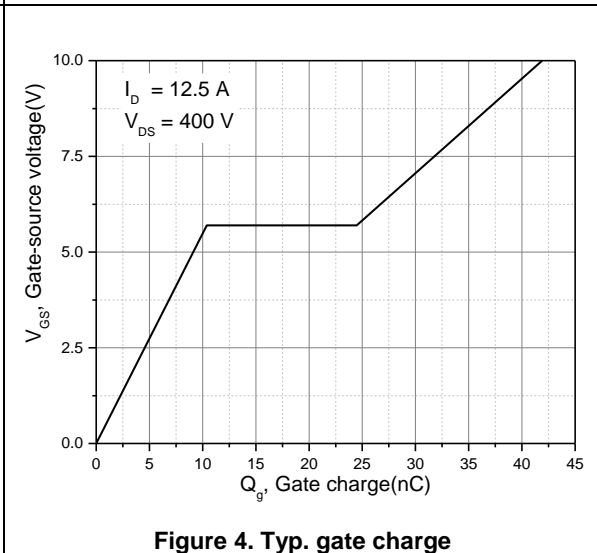


Figure 4. Typ. gate charge

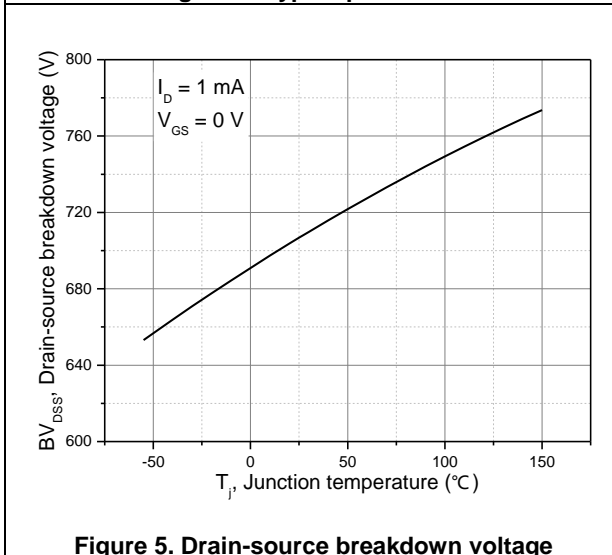


Figure 5. Drain-source breakdown voltage

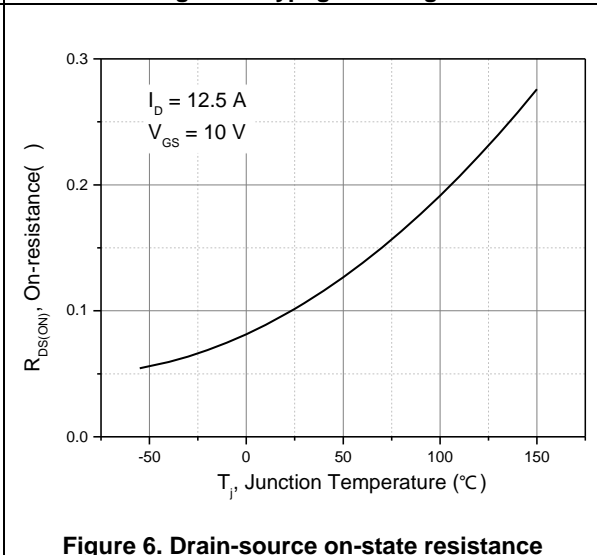


Figure 6. Drain-source on-state resistance

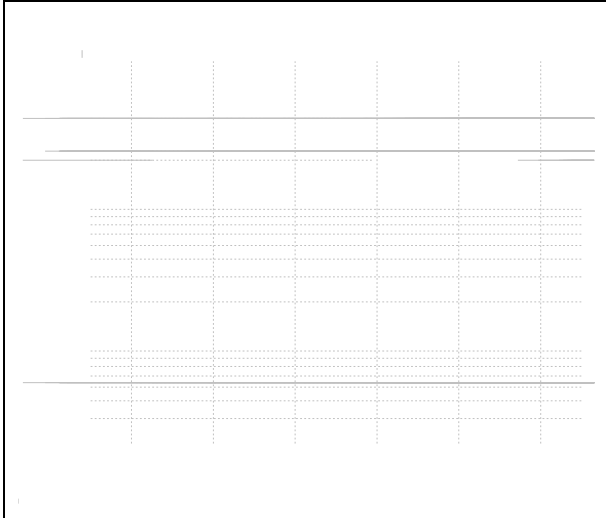


Figure 7. Forward characteristic of body diode

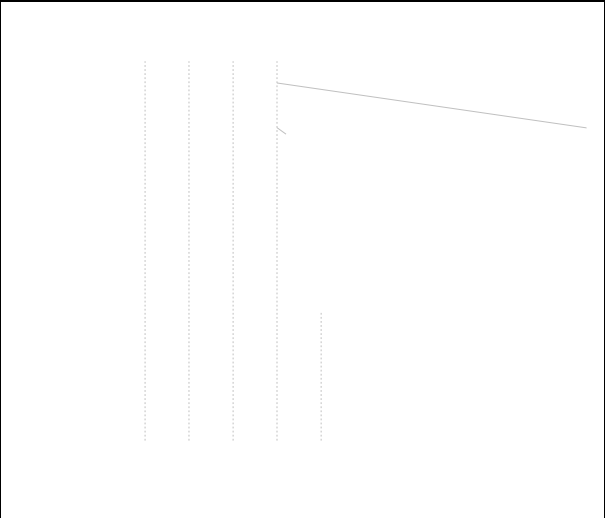


Figure 8. Drain-source on-state resistance

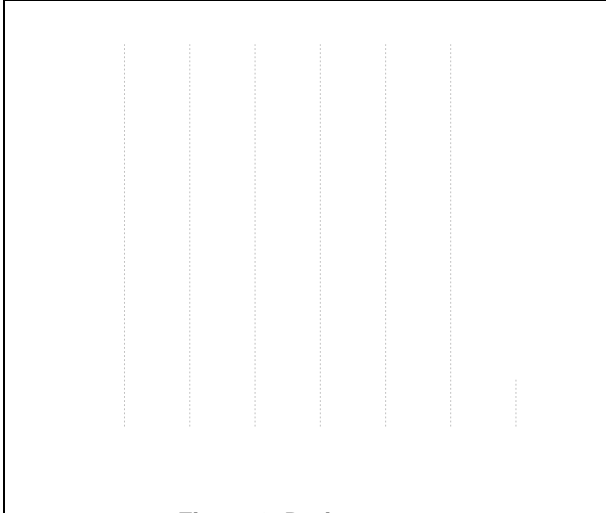


Figure 9. Drain current

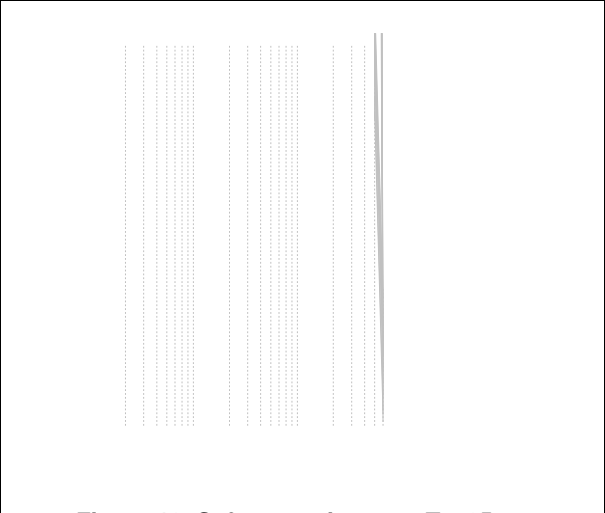


Figure 10. Safe operation area T_c=25

Test circuits and waveforms

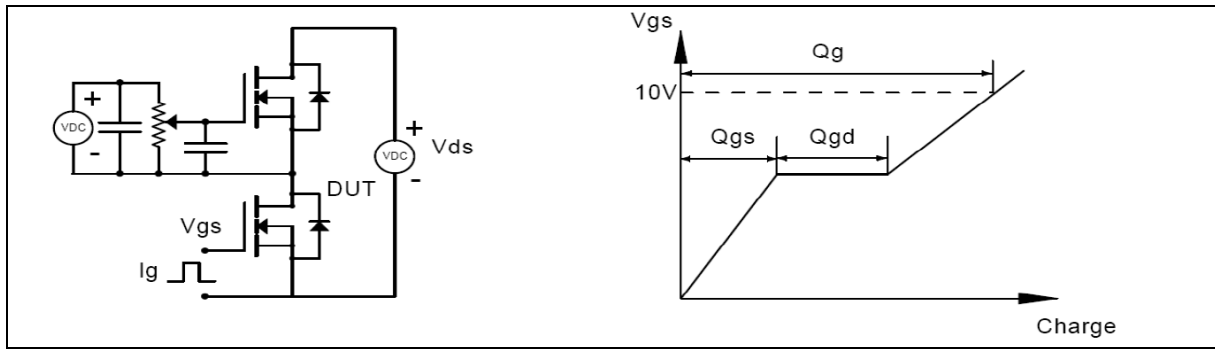


Figure 1. Gate charge test circuit & waveform

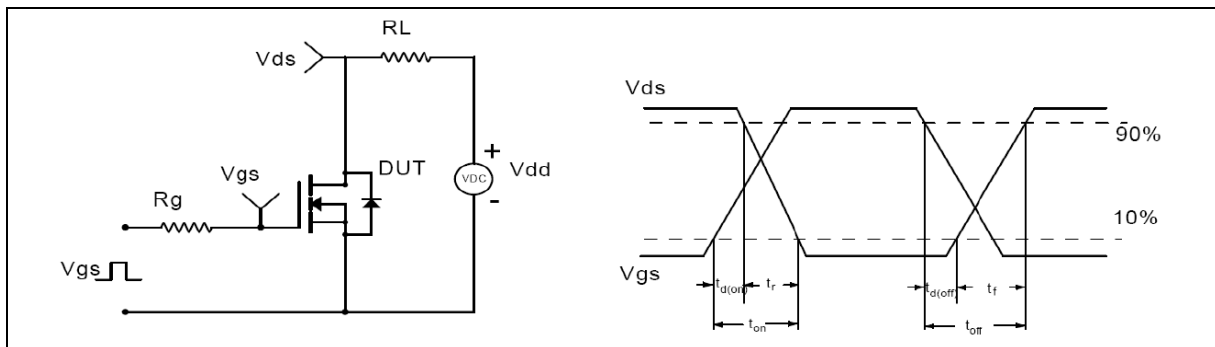


Figure 2. Switching time test circuit & waveforms

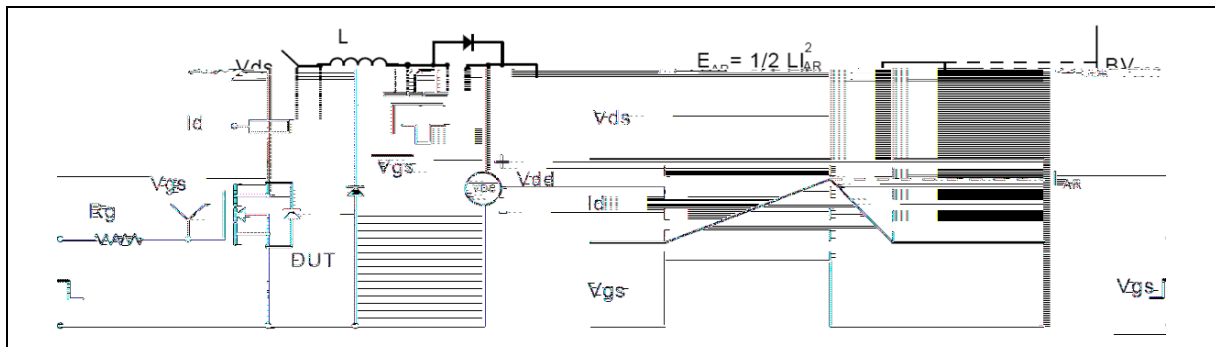


Figure 3. Unclamped inductive switching (UIS) test circuit & waveforms

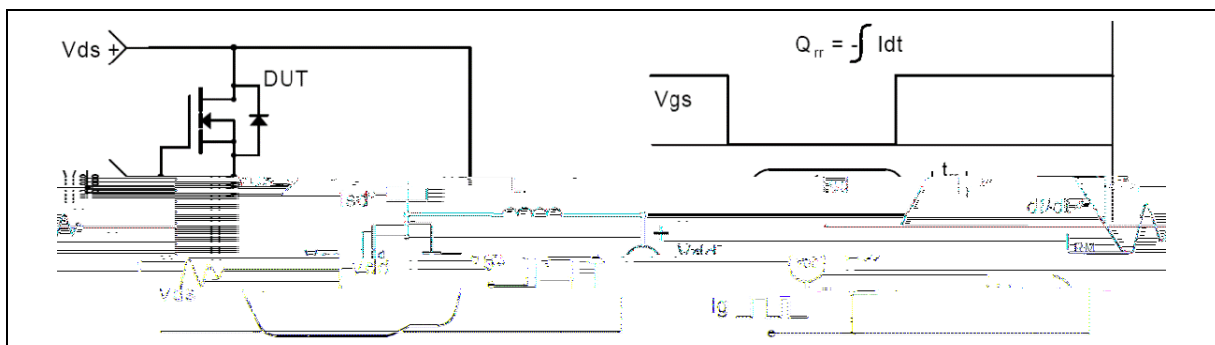
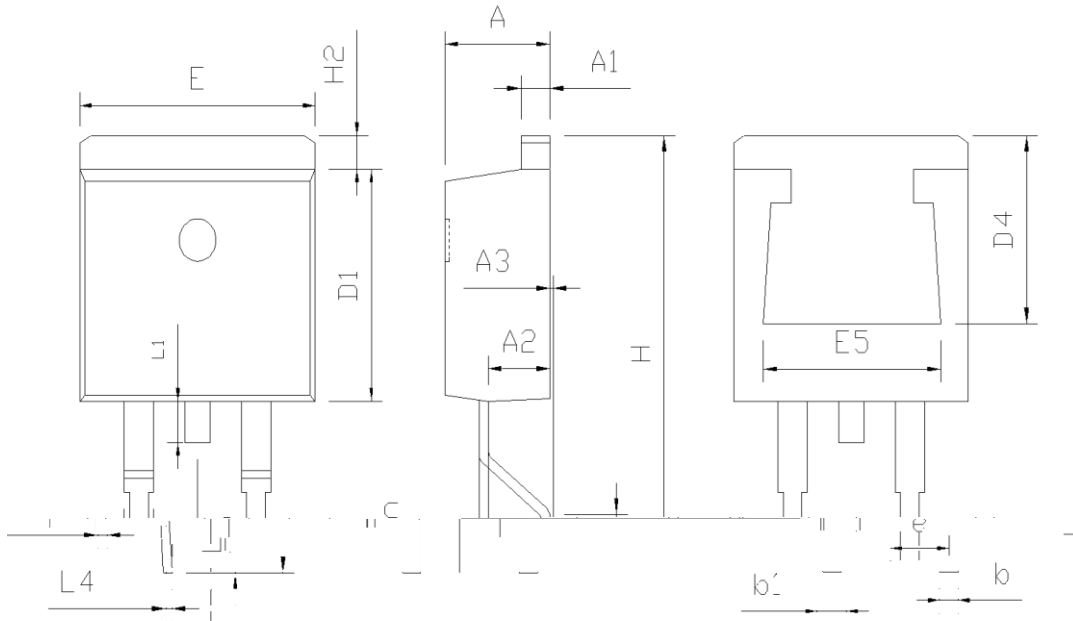


Figure 4. Diode reverse recovery test circuit & waveforms

Package Information



Symbol	mm		
	Min	Nom	Max
A	4.37	4.57	4.77
A1	1.22	1.27	1.42
A2	2.49	2.69	2.89
A3	0.00	0.13	0.25
b	0.70	0.81	0.96
b1	1.17	1.27	1.47
c	0.30	0.38	0.53
D1	8.50	8.70	8.90
D4	6.60	-	-
E	9.86	10.16	10.36
E5	7.06	-	-
e	2.54 BSC		
H	14.70	15.10	15.50
H2	1.07	1.27	1.47
L	2.00	2.30	2.60
L1	1.40	1.55	1.70
L4	0.25 BSC		
	0°	5°	9°

Version1: TO263-C package outline dimension

OSG65R125KF

65V 125A N-Channel Power MOSFET



Max
4.60
0.25

0.60
0.56

Ordering Information

Package Type	Units/ Reel	Reels/ Inner Box	Units/ Inner Box	Inner Boxes/ Carton Box	Units/ Carton Box
TO263-C	800	1	800	5	4000
TO263-J	800	1	800	10	8000

Product Information

Product	Package	Pb Free	RoHS	Halogen Free
OSG65R125KF	TO263	yes	yes	yes

