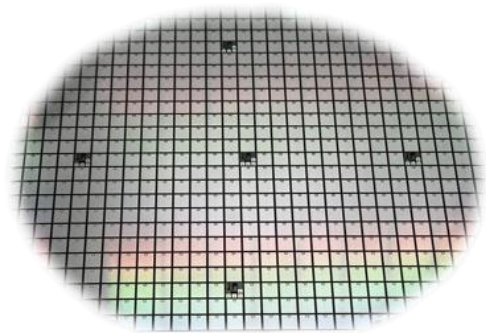


PRELIMINARY DATASHEET

SCS0009C075M22

M22 SiC power MOSFET, 5.0 mm x 5.0 mm



$V_{DSS} = 750\text{ V}$

$R_{DS(on)} = 9\text{ m}\Omega$

- positive temperature coefficient
- easy paralleling

Maximum ratings¹

PARAMETER	SYMBOL	CONDITIONS	MIN	MAX	UNIT
Drain - source voltage	V_{DSS}	$V_{GS} \leq 0\text{ V}$, $T_{vj} = 25\text{ °C}$		750	V
DC drain current	I_D			80	A
Peak drain current	I_{DM}	$t_p = 1\text{ ms}$, limited by T_{vjmax}		160	A
Gate-source voltage (DC)	V_{GSS}		-8	22	V
Gate-source surge voltage	$V_{GSS\text{ surge}}$	$t_{surge} < 300\text{ ns}$	-10	25	V
Recommended gate voltage	V_{GS}		-5	18	V
Junction temperature	T_{vj}		-40	175	°C
Junction operating temperature	$T_{vj(op)}$		-40	175	°C



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¹ Maximum rated values indicate limits beyond which damage to the device may occur per IEC 60747



MOSFET²

PARAMETER	SYMBOL	CONDITIONS	MIN	TYP	MAX	UNIT
Drain-source breakdown voltage	$V_{(BR)DSS}$	$V_{GS} \leq 0 \text{ V}$, $I_D = 250 \text{ } \mu\text{A}$, $T_{vj} = -40 \dots 25^\circ\text{C}$	750			V
Static drain-source on-state resistance ³	$R_{DS(on)}$	$I_D = 80 \text{ A}$, $V_{GS} = 18 \text{ V}$	$T_{vj} = 25^\circ\text{C}$	9		m Ω
			$T_{vj} = 125^\circ\text{C}$	10		m Ω
			$T_{vj} = 175^\circ\text{C}$	13		m Ω
Zero gate voltage drain current	I_{DSS}	$V_{DS} = 750 \text{ V}$, $V_{GS} = 0 \text{ V}$	$T_{vj} = 25^\circ\text{C}$	1	50	μA
			$T_{vj} = 175^\circ\text{C}$			μA
Gate leakage current	I_{GSS}	$V_{GS} = +22 / -8 \text{ V}$	-250	1	250	nA
Gate-source threshold voltage	$V_{GS(th)}$	$I_D = 10 \text{ mA}$, $V_{DS} = V_{GS}$, $T_{vj} = 25^\circ\text{C}$		2.6		V
Gate charge	Q_G	$I_D = 100 \text{ A}$, $V_{DS} = 800 \text{ V}$, $V_{GS} = -2 \text{ V} \dots 18 \text{ V}$				μC
Input capacitance	C_{iss}	$V_{DS} = 100 \text{ V}$, $V_{GS} = 0 \text{ V}$, $f = 100 \text{ kHz}$, $V_{AC} = 25 \text{ mV}$		5.6		nF
Output capacitance	C_{oss}	$T_{vj} = 25^\circ\text{C}$		760		pF
Reverse transfer capacitance	C_{rss}			41		pF
Input capacitance	C_{iss}	$V_{DS} = 0 \text{ V}$, $V_{GS} = 18 \text{ V}$, $f = 100 \text{ kHz}$, $T_{vj} = 25^\circ\text{C}$		10.5		nF
Internal gate resistor	R_{Gint}			6.4		Ω
Turn-on delay time	$t_{d(on)}$	$V_{CC} = 500 \text{ V}$, $I_D = 80 \text{ A}$, $R_G = 2.5 \text{ } \Omega$, $V_{GS} = -5 / +18 \text{ V}$,	$T_{vj} = 25^\circ\text{C}$	21		ns
			$T_{vj} = 125^\circ\text{C}$			ns
			$T_{vj} = 175^\circ\text{C}$	19		ns
Rise time	t_r		$T_{vj} = 25^\circ\text{C}$	45		ns
			$T_{vj} = 125^\circ\text{C}$			ns
			$T_{vj} = 175^\circ\text{C}$	44		ns
Turn-off delay time	$t_{d(off)}$	$V_{CC} = 500 \text{ V}$, $I_D = 80 \text{ A}$, $R_G = 2.5 \text{ } \Omega$, $V_{GS} = -5 / +18 \text{ V}$,	$T_{vj} = 25^\circ\text{C}$	91		ns
			$T_{vj} = 125^\circ\text{C}$			ns
			$T_{vj} = 175^\circ\text{C}$	120		ns
Fall time	t_f		$T_{vj} = 25^\circ\text{C}$	17		ns
			$T_{vj} = 125^\circ\text{C}$			ns
			$T_{vj} = 175^\circ\text{C}$	20		ns
Turn-on switching energy	E_{on}	$V_{CC} = 500 \text{ V}$, $I_D = 80 \text{ A}$, $R_G = 2.5 \text{ } \Omega$, $V_{GS} = -5 / +18 \text{ V}$,	$T_{vj} = 25^\circ\text{C}$	967		μJ
			$T_{vj} = 125^\circ\text{C}$			μJ
			$T_{vj} = 175^\circ\text{C}$	1028		μJ
Turn-off switching energy	E_{off}	$V_{CC} = 500 \text{ V}$, $I_D = 80 \text{ A}$, $R_G = 2.5 \text{ } \Omega$, $V_{GS} = -5 / +18 \text{ V}$,	$T_{vj} = 25^\circ\text{C}$	449		μJ
			$T_{vj} = 125^\circ\text{C}$			μJ
			$T_{vj} = 175^\circ\text{C}$	582		μJ
Short circuit current	I_{SC}	$t_{PCS} \leq 1.5 \text{ } \mu\text{s}$, $V_{GS} = 18 \text{ V}$, $T_{vj} = 150^\circ\text{C}$, $V_{CC} = 500 \text{ V}$, $V_{DSS \text{ Chip}} \leq 750 \text{ V}$		1500		A

² Characteristic values according to IEC 60747-9

³ Given at chip level



Diode²

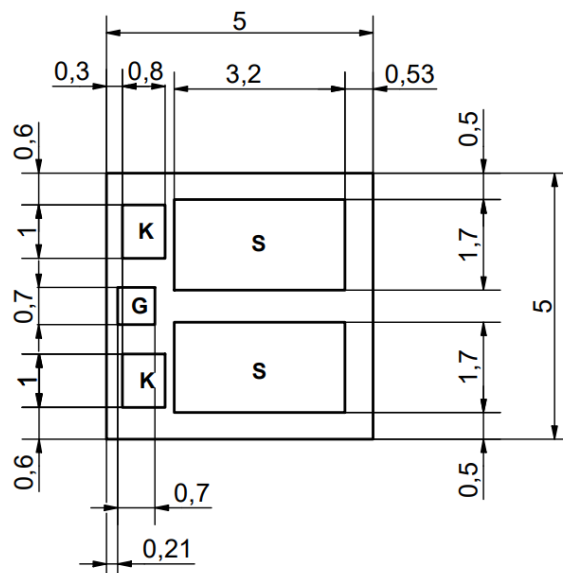
PARAMETER	SYMBOL	CONDITIONS		MIN	TYP	MAX	UNIT
Forward voltage drop	V _F	I _F = 80 A , V _{GS} = -5V	T _{vj} = 25 °C		4.4		V
			T _{vj} = 125 °C		4.0		V
			T _{vj} = 175 °C		3.8		V
Peak reverse recovery current	I _{RM}	V _R = 500 V, I _F = 80 A, di/dt = 1.03 kA/μs (25 °C), R _G = 2.5 Ω, V _{GS} = -5 / +18 V	T _{vj} = 25 °C		27		A
			T _{vj} = 125 °C				A
			T _{vj} = 175 °C		34		A
Recovery charge	Q _{rr}		T _{vj} = 25 °C		0.37		μC
			T _{vj} = 125 °C				μC
			T _{vj} = 175 °C		0.67		μC
Reverse recovery time	t _{rr}		T _{vj} = 25 °C		29		ns
			T _{vj} = 125 °C				ns
			T _{vj} = 175 °C		36		ns
Reverse recovery energy	E _{rec}		T _{vj} = 25 °C				mJ
			T _{vj} = 125 °C				mJ
			T _{vj} = 175 °C				mJ
Maximum diode pulse current	I _{s, pulse}	V _{GS} = -5 V, pulse width t _p limited by T _{jmax}	T _{vj} = 25 °C		430		A

Mechanical properties

PARAMETER		UNIT
Die size	5.0 x 5.0	mm ²
Gate pad size	0.7 x 0.7	mm ²
Kelvin pad size	1.00 x 0.80	mm ²
Thickness	150	μm
Wafer diameter	150	mm
Maximum chips per wafer	524	pcs
Frontside passivation	Polyimide	
Frontside metal (gate and source pads)	AlCu, 4.0 Ni:Pd:Au, 2:0.2:0.1	μm
Backside metal	Ti:Ni:Ag, 0.3 : 0.4 : 1.2	μm

Chip drawing

Chip drawings including scribeline



This is an electrostatic sensitive device.

Ordering Information 订购信息

Part Number	SCS0009C075m22
Frontside metal (gate and source pads) ordering options	AICu: SCS0009C075m22 NiPdAu: SCS0009C075m22_F01
Package	Bare Die
Packaging Method	Wafer
RoHS	Yes