

KEY FEATURES

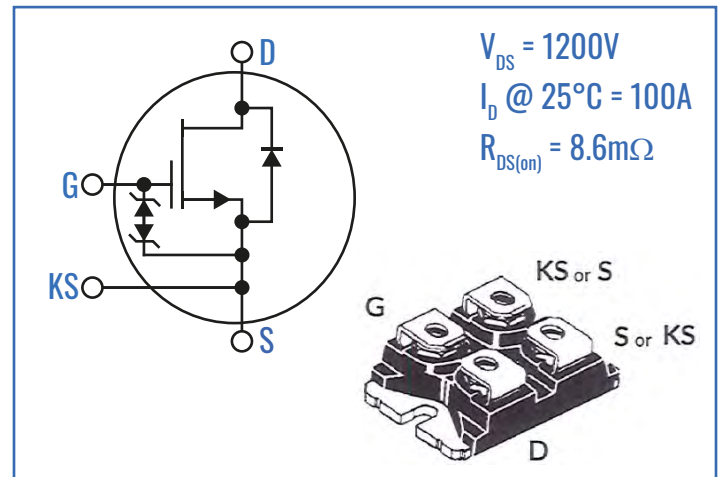
- $I_D = 100A$
- $R_{DS(on)} = 8.6m\Omega$
- LOW GATE CHARGE
- KELVIN SOURCE
- SOT 227B

BENEFITS

- PARALLEL DEVICES WITHOUT THERMAL RUNAWAY
- HIGHER SYSTEM EFFICIENCY
- EXCELLENT REVERSE RECOVERY

APPLICATIONS

- HIGH EFFICIENCY CONVERTERS & MOTOR DRIVES
- POWER SUPPLIES
- BATTERY CHARGERS
- SOLAR INVERTERS
- INDUCTION HEATING



ORDERING GUIDE

Part Number	SD11740
Description	1200V SiC N-Channel Power MOSFET

ABSOLUTE MAXIMUM RATINGS ($T_c = 25^\circ C$)

SYMBOL	CHARACTERISTIC	TEST CONDITIONS	VALUE	UNIT
$V_{DS,max}$	Drain-Source Voltage	$V_{GS} = 0V, I_D = 100\mu A$	1200	V
$V_{GS,max}$	Gate-Source Voltage (dynamic)	Absolute maximum values	-20/+20	V
I_D	Continuous Drain Current	$V_{GS} = 15V$	100	A
$I_{D,pulse}$	Pulsed Drain Current	Pulse Width t_p Limited by T_{jmax}	tbd	A
P_D	Maximum Power Dissipation		tbd	W
T_j, T_{STG}	Junction Temperature, Operating and Storage		-55 to +175	$^\circ C$

ELECTRICAL CHARACTERISTICS - STATIC ($T_J = 25^\circ\text{C}$)

SYMBOL	CHARACTERISTIC	TEST CONDITIONS	MIN.	TYP.	MAX.	UNIT
$V_{(BR)DSS}$	Drain-Source Breakdown Voltage	$V_{GS} < 0V, I_D = 1mA$	1200			V
I_{DSS}	Total Drain Leakage Current	$V_{GS} = 0V, V_{DS} = 1200V, T_J = 25^\circ\text{C}$		6	600	μA
		$V_{GS} = 0V, V_{DS} = 1200V, T_J = 175^\circ\text{C}$		65		
I_{GSS}	Total Gate Leakage Current	$V_{GS} = -20V/+20V, V_{DS} = 0V$		5	± 20	μA
$R_{DS(on)}$	Drain-Source On-Resistance	$V_{GS} = 12V, I_D = 100A, T_J = 25^\circ\text{C}$		8.6	11	$\text{m}\Omega$
		$V_{GS} = 12V, I_D = 100A, T_J = 125^\circ\text{C}$		13.5		
		$V_{GS} = 12V, I_D = 100A, T_J = 175^\circ\text{C}$		18.2		
$V_{G(th)}$	Gate Threshold Voltage	$V_{GS} = 5V, I_D = 10mA$	4	4.7	6	V
R_G	Gate Resistance	$f = 1\text{MHz, open drain}$		0.8	1.5	Ω

ELECTRICAL CHARACTERISTICS - REVERSE DIODE ($T_J = 25^\circ\text{C}$)

SYMBOL	CHARACTERISTIC	TEST CONDITIONS	MIN.	TYP.	MAX.	UNIT
I_S	Diode Continuous Forward Current	$T_C < 110^\circ\text{C}$			120	A
$I_{S(pulse)}$	Diode Pulse Current	$T_C = 25^\circ\text{C}$			550	A
V_{FSD}	Forward Voltage	$V_{GS} = 0V, I_F = 100A, T_J = 25^\circ\text{C}$		1.65	2	V
		$V_{GS} = 0V, I_F = 100A, T_J = 175^\circ\text{C}$		2.4		
Q_{rr}	Reverse Recovery Charge	$V_R = 800V, I_F = 100A, V_{GS} = -5V, R_{G(EXT)} = 22\Omega, di/dt = 3700A/\mu\text{s}, T_J = 25^\circ\text{C}$		1373		nC
t_{rr}	Reverse Recovery Time			60		ns
Q_{rr}	Reverse Recovery Charge	$V_R = 800V, I_F = 100A, V_{GS} = -5V, R_{G(EXT)} = 22\Omega, di/dt = 3700A/\mu\text{s}, T_J = 150^\circ\text{C}$		1275		nC
t_{rr}	Reverse Recovery Time			60		ns

ELECTRICAL CHARACTERISTICS - DYNAMIC ($T_J = 25^\circ\text{C}$)

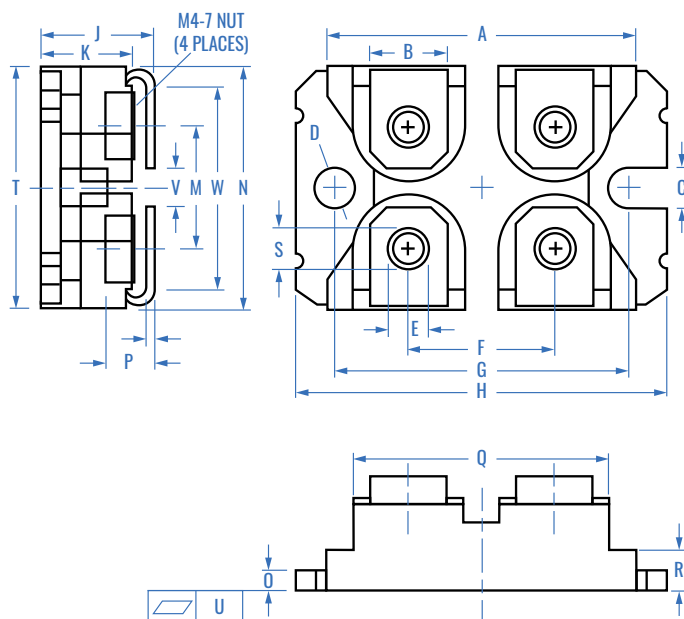
SYMBOL	CHARACTERISTIC	TEST CONDITIONS	MIN.	TYP.	MAX.	UNIT
C_{iss}	Input Capacitance			8512		pF
C_{oss}	Output Capacitance	$V_{DS} = 100V, V_{GS} = 0V, f = 100\text{kHz}$		755		
C_{rss}	Reverse Transfer Capacitance			9		
$C_{oss(er)}$	Effective Output Capacitance, Energy Related	$V_{DS} = 0V \text{ to } 800V, V_{GS} = 0V$		395		pF
$C_{oss(tr)}$	Effective Output Capacitance, Time Related	$V_{DS} = 0V \text{ to } 800V, V_{GS} = 0V$		870		pF
E_{oss}	C_{oss} Stored Energy	$V_{DS} = 800V, V_{GS} = 0V$		128		μJ
Q_G	Total Gate Charge			234		nC
Q_{GD}	Gate-Drain Charge	$V_{DS} = 800V, I_D = 100A, V_{GS} = -5V \text{ to } 15V$		40		
Q_{GS}	Gate-Source Charge			96		
$t_{d(on)}$	Turn-On Delay Time			32		ns
t_r	Rise Time			58		
$t_{d(off)}$	Turn-Off Delay Time	$V_{DS} = 800V, I_D = 100A,$ Gate Driver = -5V to +15V,		113		
t_f	Fall Time	Turn-on $R_{G(EXT)} = 1.5\Omega$, Turn-off $R_{G(EXT)} = 5\Omega$,		16		
E_{ON}	Turn-On Energy	Inductive Load, FWD: same device with $V_{GS} = -5V, R_G = 5\Omega,$ $T_J = 25^\circ\text{C}$		3463		
E_{OFF}	Turn-Off Energy			722		μJ
E_{TOTAL}	Total Switching Energy			4185		

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ELECTRICAL CHARACTERISTICS - DYNAMIC ($T_J = 25^\circ\text{C}$) - cont...

SYMBOL	CHARACTERISTIC	TEST CONDITIONS	MIN.	TYP.	MAX.	UNIT	
$t_{d(on)}$	Turn-On Delay Time	$V_{DS} = 800\text{V}$, $I_D = 100\text{A}$, Gate Driver = -5V to +15V, Turn-on $R_{G(EXT)} = 1.5\Omega$, Turn-off $R_{G(EXT)} = 5\Omega$, Inductive Load, FWD: same device with $V_{GS} = -5\text{V}$, $R_G = 5\Omega$, $T_J = 150^\circ\text{C}$		28		ns	
t_r	Rise Time			66			
$t_{d(off)}$	Turn-Off Delay Time			126			
t_f	Fall Time			16		μJ	
E_{ON}	Turn-On Energy			3539			
E_{OFF}	Turn-Off Energy			700			
E_{TOTAL}	Total Switching Energy			4239		$V_{DS} = 800\text{V}$, $I_D = 100\text{A}$, Gate Driver = -5V to +15V, Turn-on $R_{G(EXT)} = 1.5\Omega$, Turn-off $R_{G(EXT)} = 5\Omega$, Inductive Load, FWD: UJ3D1250K, $T_J = 25^\circ\text{C}$	
$t_{d(on)}$	Turn-On Delay Time			33			ns
t_r	Rise Time			50			
$t_{d(off)}$	Turn-Off Delay Time			113			
t_f	Fall Time		15		μJ		
E_{ON}	Turn-On Energy		1895				
E_{OFF}	Turn-Off Energy		680				
E_{TOTAL}	Total Switching Energy		2575		$V_{DS} = 800\text{V}$, $I_D = 100\text{A}$, Gate Driver = -5V to +15V, Turn-on $R_{G(EXT)} = 1.5\Omega$, Turn-off $R_{G(EXT)} = 5\Omega$, Inductive Load, FWD: UJ3D1250K, $T_J = 150^\circ\text{C}$		
$t_{d(on)}$	Turn-On Delay Time		33				ns
t_r	Rise Time		52				
$t_{d(off)}$	Turn-Off Delay Time		127				
t_f	Fall Time		15			μJ	
E_{ON}	Turn-On Energy		1989				
E_{OFF}	Turn-Off Energy		595				
E_{TOTAL}	Total Switching Energy		2584				

OUTLINE DIMENSIONS



SYM	Inches		Millimeters	
	Min.	Max.	Min.	Max.
A	1.240	1.255	31.50	31.88
B	0.307	0.323	7.80	8.20
C, D, E	0.161	0.169	4.09	4.29
F	0.587	0.595	14.91	15.11
G	1.186	1.193	30.12	30.30
H	1.489	1.505	37.80	38.23
J	0.460	0.481	11.68	12.22
K	0.351	0.378	8.92	9.60
L	0.030	0.033	0.76	0.84
M	0.496	0.506	12.60	12.85
N	0.990	1.001	25.15	25.42
O	0.078	0.084	1.98	2.13
P	0.195	0.235	4.95	5.97
Q	1.045	1.059	26.54	26.90
R	0.155	0.174	3.94	4.42
S	0.186	0.191	4.72	4.85
T	0.968	0.987	24.59	25.07
U	-0.002	0.004	-0.05	0.1
V	0.130	0.180	3.30	4.57
W	0.780	0.830	19.81	21.08