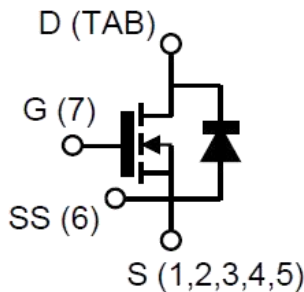
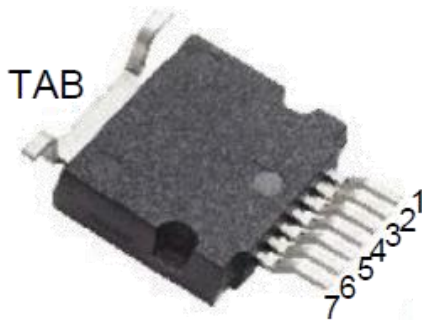


Silicon Carbide Power MOSFET (N-Channel Enhancement)

V_{DS}	1200V
I_D (25°C)	53A
$R_{DS(on)}$	40mΩ



Features

- High speed switching
- Essentially no switching losses
- Reduction of heat sink requirements
- Maximum working temperature at 175 °C
- High blocking voltage
- Fast Intrinsic diode with low recovery current
- High-frequency operation
- Halogen free, RoHS compliant

Typical Applications

Typical applications are in power factor correction(PFC), solar inverter, uninterruptible power supply, motor drives, photovoltaic inverter, electric car and charger.

Mechanical Data

- **Package:** T2PAK
- **Terminals:** Tin plated leads
- **Polarity:** As marked

■Maximum Ratings ($T_c=25^\circ\text{C}$ Unless otherwise specified)

PARAMETER	SYMBOL	UNIT	VALUE	TEST CONDITIONS	NOTE
Device marking code				D212040T2GH	
Drain source voltage @ $T_j=25^\circ\text{C}$	$V_{DS,max}$	V	1200	$V_{GS}=0\text{ V}$, $I_D=100\mu\text{A}$	
Gate source voltage @ $T_j=25^\circ\text{C}$	$V_{GS,max}$	V	-10/+25	Absolute maximum values (AC f > 1Hz, duty cycle < 1%)	
Gate source voltage @ $T_j=25^\circ\text{C}$	$V_{GS,op}$	V	-5/+20	Recommended operational values	
Continuous drain current @ $T_c=25^\circ\text{C}$	I_D	A	53	$V_{GS}=20\text{V}$, $T_c=25^\circ\text{C}$	
Continuous drain current @ $T_c=110^\circ\text{C}$			36	$V_{GS}=20\text{V}$, $T_c=110^\circ\text{C}$	
Pulsed drain current	$I_{D(pulsed)}$	A	349	Pulse width t_p limited by $T_{j,max}$	
Avalanche energy, Single Pulse	E_{AS}	mJ	1875	$V_{DD}=100\text{V}$, $I_D=14\text{A}$	
Power Dissipation	P_{TOT}	W	223	$T_c=25^\circ\text{C}$, $T_j = 175^\circ\text{C}$	
Operating junction and Storage temperature range	T_j, T_{stg}	$^\circ\text{C}$	-55 to +175		
Soldering temperature	T_L	$^\circ\text{C}$	260	1.6mm (0.063") from case for 10s	
Mounting torque	T_M	Nm	1.0	M3 screw Maximum of mounting process: 3	


■Static Electrical Characteristics (Tc=25°C unless otherwise specified)

PARAMETER	SYMBOL	UNIT	Min.	Typ.	Max.	Test Conditions	Note
Gate threshold voltage	$V_{GS(th)}$	V		3.2		$V_{DS}=V_{GS}$, $I_D=40mA$	
Drain source breakdown voltage	$V_{(BR)DSS}$	V	1200			$V_{GS}=0$, $I_D=100\mu A$	
Zero gate voltage drain current	I_{DSS}	μA		<1	50	$V_{DS}=1200V$, $V_{GS}=0V$	
				10	500	$V_{DS}=1200V$, $V_{GS}=0V$, $T_j=175^\circ C$	
Gate source leakage current	I_{GSS}	nA			250	$V_{GS}=20V$, $V_{DS}=0V$	
Current drain source on-state resistance	$R_{DS(on)}$	m Ω		40	52	$V_{GS}=20V$, $I_D=30A$	
				72		$V_{GS}=20V$, $I_D=30A$, $T_j=175^\circ C$	
Transconductance	g_f	S		12		$V_{DS}=15V$, $I_D=30A$	

■Dynamic Electrical Characteristics (Tc=25°C unless otherwise specified)

PARAMETER	SYMBOL	UNIT	Min.	Typ.	Max.	Test Conditions	Note
Input capacitance	C_{iss}	pF		3682		$V_{DS}=800V$, $V_{GS}=0V$, $T_j=25^\circ C$, $f=1MHz$, $V_{AC}=25mV$	
Output capacitance	C_{oss}			149			
Reverse capacitance	C_{rss}			26			
Coss stored energy	E_{oss}	μJ		60			
Gate source charge	Q_{gs}	nC		68		$V_{DS}=800V$, $V_{GS}=-5/20V$, $I_D=30A$	
Gate drain charge	Q_{gd}			66			
Gate charge	Q_g			229			
Internal Gate Resistance	$R_{G(int)}$	Ω		0.9		$f=1MHz$, $V_{AC}=25mV$	

■Switching Characteristics (Tc=25°C unless otherwise specified)

PARAMETER	SYMBOL	UNIT	Min.	Typ.	Max.	Test Conditions	Note
Turn on switching energy	$t_{d(on)}$	ns		26		$V_{DD}=800V$, $V_{GS}=-4/+20V$, $I_D=30A$, $R_L=27\Omega$, $R_{G(ext)}=2.7\Omega$	
Turn off switching energy	t_r			50			
Turn on delay time	$t_{d(off)}$			7			
Rise time	t_r			11			
Turn off delay time	E_{on}	μJ		125		$V_{DD}=800V$, $V_{GS}=0/+20V$, $I_D=40A$, $R_{g(ext)}=2.7\Omega$	
Fall time	E_{off}			191			

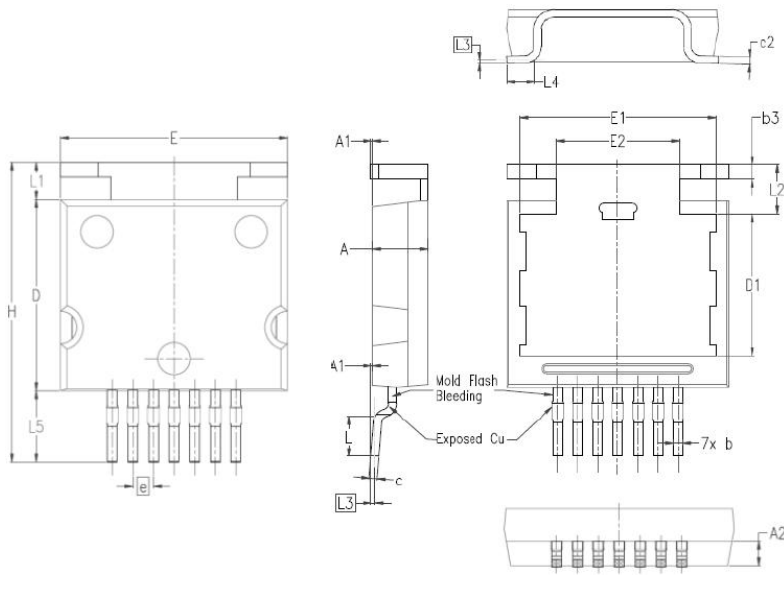
■Body diode characteristics (T_c=25°C unless otherwise specified)

PARAMETER	SYMBOL	UNIT	Min.	Typ.	Max.	Test Conditions	Note
Diode forward voltage	V _{SD}	V		3.0		V _{GS} =0V, I _{SD} =7.5A	
Continuous diode forward current	I _s	A		31		V _{GS} =0V, T _c =25°C	
Reverse recovery time	t _{rr}	nS		59		V _{DS} =400V, V _{GS} =0V, I _{SD} =30A, di/dt=300A/uS	
Reverse recovery charge	Q _{rr}	nC		212			
Peak reverse recovery current	I _{rrm}	A		5.1			

■Thermal Characteristics (T_a=25°C Unless otherwise specified)

PARAMETER	SYMBOL	UNIT	Value
Thermal resistance	R _{θJ-C}	°C/W	0.67

■Outline Dimensions



Symbol	mm		
	Min.	Typ.	Max.
A	3.30	3.50	3.70
A1	---	0.10	0.25
A2	1.30	1.50	1.70
b	0.50	0.60	0.70
b3	0.80	0.90	1.00
c	0.40	0.50	0.60
c2	0.40	0.50	0.60
D	11.70	11.80	11.90
D1	8.80	9.00	9.20
E	13.60	14.00	14.40
E1	12.00	12.40	12.80
E2	7.60	7.80	8.00
e	1.27 BSC		
H	17.70	18.50	19.30
L	1.90	2.50	3.10
L1	2.30 REF		
L2	2.85	3.10	3.35
L3	0.25 BSC		
L4	1.25	1.85	2.45
L5	4.40 REF		

Preliminary