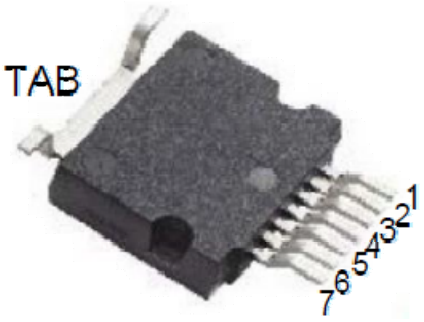
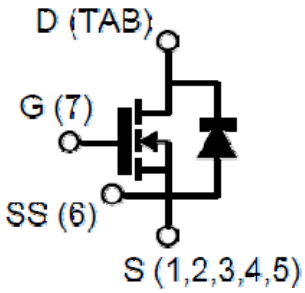
Silicon Carbide Power MOSFET （N-Channel Enhancement）

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
- AEC-Q101 qualified

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℃ Unless otherwise specified）

PARAMTETER	SYMBOL	UNIT	VALUE	TEST CONDITIONS	NOTE
Device marking code			D212040T2GH		
Drain source voltage @ T_j=25°C	$V_{DS,max}$	V	1200	V_{GS}=0 V, I_D=100uA	
Gate source voltage @ T_j=25°C	$V_{GS,max}$	V	-10/+25	Absolute maximum values (AC f > 1Hz, duty cycle < 1%)	
Gate source voltage @ T_j=25°C	$V_{GS,op}$	V	-5/+20	Recommended operational values	
Continuous drain current @ T_c=25°C	I_D	A	53	V_{GS}=20V, Tc=25℃	
Continuous drain current @ T_c=110°C			36	V_{GS}=20V, Tc=110℃	
Pulsed drain current	$I_{D(pulsed)}$	A	349	Pulse width tp limited by Tj,max	
Avalanche energy, Single Pulse	E_{AS}	mJ	1875	V_{DD}=100V, I_D=14A	
Power Dissipation	P_{TOT}	W	223	T_c=25°C , Tj = 175℃	
Operating junction and Storage temperature range	Tj ,Tstg	°C	-55 to +175		
Soldering temperature	T_L	°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℃ unless otherwise specified ）

PARAMTETER	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=100uA	
Zero gate voltage drain current	I_{DSS}	uA		<1	50	V_{DS}=1200V, V_{GS}= 0V	
				10	500	V_{DS}=1200V, V_{GS}= 0V, Tj= 175℃	
Gate source leakage current	I_{GSS}	nA			250	V_{GS}= 20V, V_{DS}=0V	
Current drain source on-state resistance	$R_{DS\ ON}$	mΩ		40	52	V_{GS}=20V, I_D=30A	
				72		V_{GS}=20V, I_D=30A,Tj=175℃	
Transconductance	g_f	S		12		V_{DS}=15V,I_D=30A	

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

PARAMTETER	SYMBOL	UNIT	Min.	Typ.	Max.	Test Conditions	Note
Input capacitance	Ciss	pF		3682		V_{DS}=800V, V_{GS}=0V, Tj=25℃, f=1MHz, V_{AC}= 25mV	
Output capacitance	Coss			149			
Reverse capacitance	Crss			26			
Coss stored energy	Eoss	uJ		60			
Gate source charge	Qgs	nC		68		V_{DS}=800V, V_{GS}=-5/20V, I_D=30A	
Gate drain charge	Qgd			66			
Gate charge	Qg			229			
Internal Gate Resistance	$R_{G(int)}$	Ω		0.9		f =1MHz, V_{AC} = 25mV	

■Switching Characteristics（Tc=25℃ unless otherwise specified ）

PARAMTETER	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=27Ω, $R_{G(ext)}$= 2.7Ω	
Turn off switching energy	t_r			50			
Turn on delay time	$t_{d(off)}$			7			
Rise time	t_f			11			
Turn off delay time	Eon	uJ		125		V_{DD}=800V, V_{GS}=0/+20V, I_D=40A, $R_{g(ext)}$=2.7Ω	
Fall time	Eoff			191			

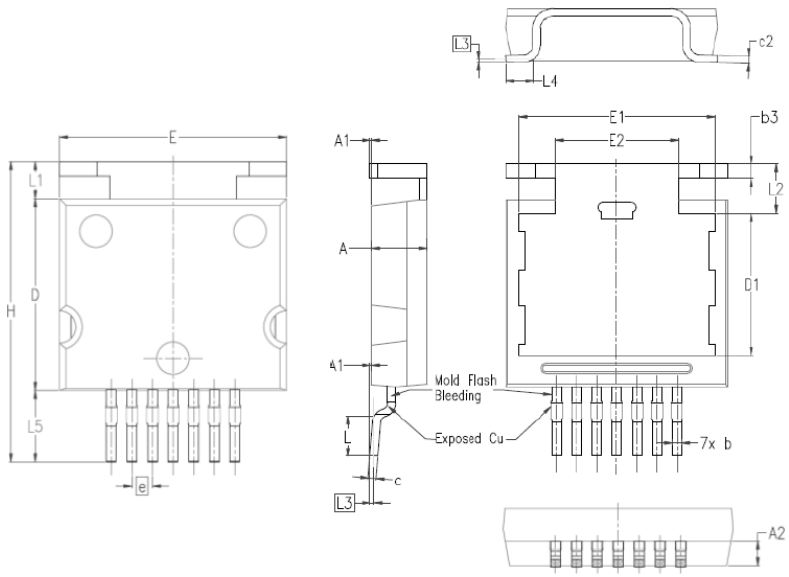
■Body diode characteristics（Tc=25℃ unless otherwise specified ）

PARAMTETER	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,Tc=25℃	
Reverse recovery time	trr	nS		59		V_{DS}=400V, V_{GS}=0V, I_{SD}=30A, di/dt=300A/uS	
Reverse recovery charge	Qrr	nC		212			
Peak reverse recovery current	Irrm	A		5.1			

■Thermal Characteristics （T_a=25℃ Unless otherwise specified）

PARAMETER	SYMBOL	UNIT	Value
Thermal resistance	$R_{\theta J-C}$	°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	