TOWARD RELAYS

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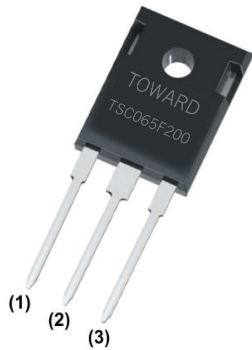
TSC065F200

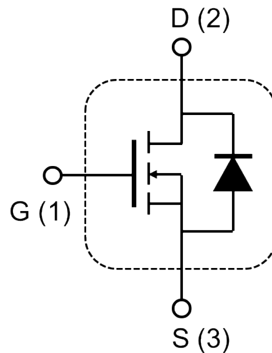
Silicon Carbide Power MOSFET

N-CHANNEL ENHANCEMENT MODE

TO-247-3L



Inner Circuit



Product Summary

V_{DS}	650V
$I_{D(@25°C)}$	12A
$R_{DS(on)}$	200mΩ

Features

- Low On-Resistance
- Low Capacitance
- Avalanche Ruggedness
- Pb-free lead plating

Benefits

- Higher System Efficiency
- Parallel Device Convenience
- High Temperature Application
- High Frequency Operation

Applications

- SMPS
- DC/DC Converters
- UPS
- Power Inverters
- Motor Drives
- Solar/ Wind Renewable Energy

Maximum Ratings (T_c=25°C)

Parameter	Symbol	Test Conditions	Value	Unit
Continuous Drain Current*	I_{DS}	V_{GS}=20V, T_C=25°C	12	A
		V_{GS}=20V, T_C=75°C	10	A
		V_{GS}=20V, T_C=100°C	8	A
Gate Source Voltage	V_{GS}		-5/+25	V
Junction Temperature	T_j		-55/+150	°C
Storage Temperature	T_{stg}		-55/+150	°C
Soldering Temperature	T_L		260	°C

*by estimation

Electrical Characteristics (T_j=25°C)

Parameter	Symbol	Test Conditions	Min.	Typ.	Max.	Unit
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	V_{GS}=0V, I_{DS}=100μA	650			V
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS}=10V, I_{DS}=20mA		2.4		V
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS}=650V, V_{GS}=0V		1	50	μA
		V_{DS}=650V, V_{GS}=0V T_j=150°C		5	200	
Gate-Source Leakage Current	I_{GSS}	V_{GS}=20V, V_{DS}=0V			250	nA
Drain-Source On-State Resistance	$R_{DS(on)}$	V_{GS}=20V, I_{DS}=5A		200	260	mΩ
		V_{GS}=20V, I_{DS}=5A, T_j=100°C		300		
Input Capacitance*	C_{iss}	V_{GS}=0V, V_{DS}=400V f=1MHz, V_{AC}=25mV		382		pF
Output Capacitance*	C_{oss}			46		
Reverse Transfer Capacitance*	C_{rss}			10		
Turn On Delay Time*	$t_{d(on)}$	V_{DS}=400V, V_{GS}=0/20V, I_D=4A, R_L=100Ω		<50		ns
Rise Time*	t_r			<50		
Turn Off Delay Time*	$t_{d(off)}$			<50		
Fall Time*	t_f			<50		
Gate Resistance*	R_G	f=1MHz, V_{AC}=25mV		16		Ω

*by estimation

Built-in SiC Diode Characteristics (T_j=25°C)

Parameter	Symbol	Test Conditions	Typ.	Unit
Inverse Diode Forward Voltage*	V_{SD}	V_{GS}=0V, I_{SD}=2A	5	V
Reverse Recovery Time*	t_{rr}	V_{GS}=0V, I_{SD}=2A, V_{DS}=400V, di/dt=300A/μs	30	ns
Reverse Recovery Charge*	Q_{rr}		25	nC
Peak Reverse Recovery Current*	I_{rrm}		1	A

*by estimation

Gate Charge Characteristics (T_j=25°C)

Parameter	Symbol	Test Conditions	Value	Unit
Gate to Source Charge*	Q_{GS}	V_{DS}=400V, V_{GS}=0/20V I_D=5A	3	nC
Gate to Drain Charge*	Q_{GD}		6	
Total Gate Charge*	Q_G		27	

*by estimation

Thermal Resistance

Parameter	Symbol	Value	Unit
Thermal Resistance, Junction to Case	$R_{\theta,JC}$	TBD	K/W
Thermal Resistance, Junction to Ambient	$R_{\theta,JA}$	TBD	

(1) The information provided herein is subject to change without notice.

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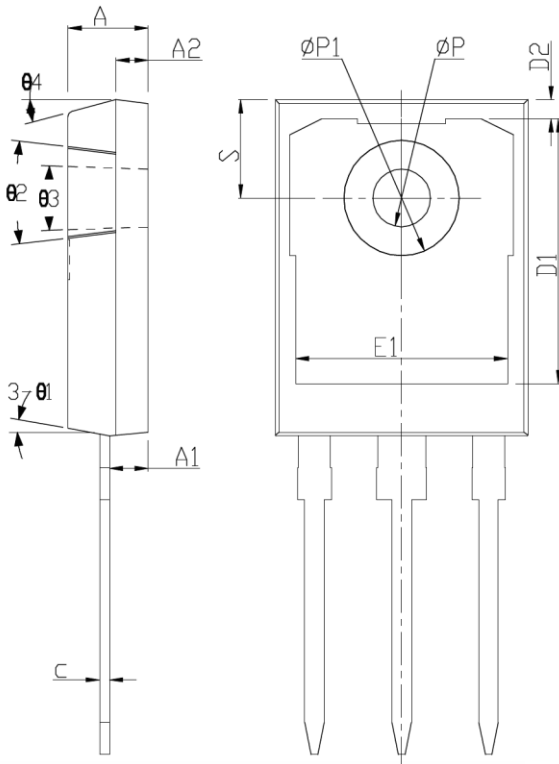
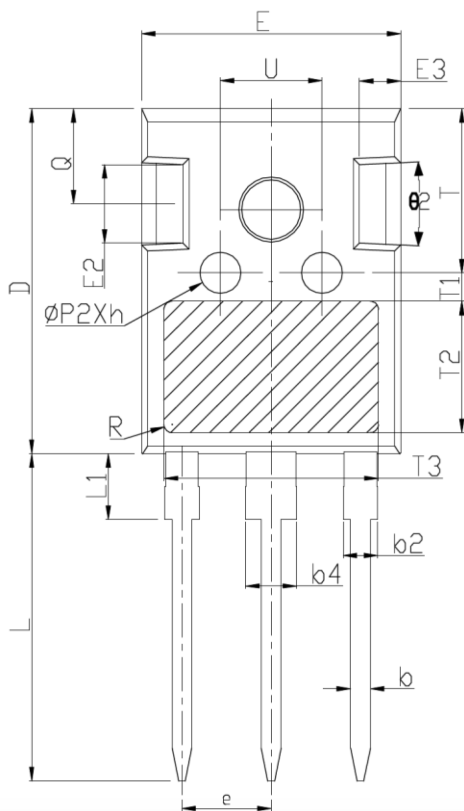
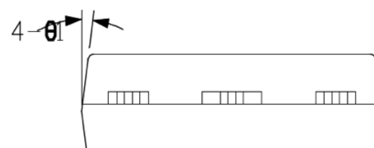
Mechanical Parameters







SYMBOL	DIMENSIONS IN MILLIMETERS		
	MIN	NOM	MAX
A	4.75	5.00	5.25
A1	2.16	2.41	2.66
A2	1.85	2.00	2.15
b	1.11	1.21	1.35
b2	1.90	2.01	2.25
b4	2.90	3.01	3.25
c	0.51	0.61	0.75
D	20.60	21.00	21.40
D1	16.15	16.55	16.95
D2	1.00	1.20	1.40
E	15.50	15.80	16.10
E1	13.00	13.30	13.60
E2	4.70	5.00	5.30
E3	2.25	2.50	2.75
e	5.44BSC		
h	0.00	0.10	0.25
L	19.52	19.92	20.32
L1	-	-	4.30
ΦP	3.35	3.60	3.85
ΦP1	-	-	7.30
ΦP2	2.25	2.50	2.75
Q	5.50	5.80	6.10
S	6.15BSC		
R	0.50REF		
T	9.70	-	10.30
T1	1.65REF		
T2	8.00REF		
T3	12.80REF		
U	5.90	-	6.50
θ1	4°	7°	10°
θ2	2°	5°	8°
θ3	1°	-	2°
θ4	10°	15°	20°

NOTES:
1.All dimensions are in mm.
2.Tolerance: ±0.05mm.