General Description

The SJT015R65 uses advanced SIC technology to provide excellent $R_{DS(ON)}$, low gate charge and operation with gate voltages as low as 18V. This device is suitable for use as a wide variety of applications.

Features

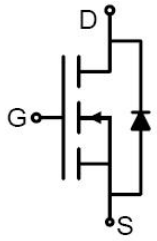
- Wide Bandgap SiC MOSFET Technology
- Low On-Resistance with High Blocking Voltage
- Low Capacitances with High-Speed Switching
- Low Reverse Recovery
- Easy to Parallel and Simple to Drive

Application

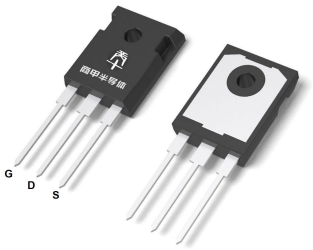
- Switch Mode Power Supplies
- High Voltage DC/DC Converters
- Battery Chargers
- Solar Inverters

Key Performance Parametes

Parameter	Value	Unit
V_{DS}	650	V
$R_{DS(ON)\_TYP}$	15	mΩ
I_D	126	A
Q_G	146	nC



Schematic Diagram



TO-247 top & bottom view

RoHS

Package Marking and Ordering Information

Device/Ordering Code	Marking	Package	Packing	Reel Size	Tape width	Quantity
SJT015R65	SJT015R65	TO-247	Tape	\	\	1000 Pcs

Table 1. Absolute Maximum Ratings (T_C=25℃ unless otherwise noted)

Symbol	Parameter	Limit	Unit
V_{DS}	Drain-Source Voltage (V_{GS}=0V)	650	V
V_{GS}	Gate-Source Voltage (V_{DS}=0V)	-10/+22	V
I_D	Drain Current-Continuous(T_C=25℃)	118	A
	Drain Current-Continuous(T_C=100℃)	74	A
$I_{DM\ (pluse)}$	Drain Current-Continuous@ Current-Pulsed (Note 1)	472	A
P_D	Maximum Power Dissipation(T_C=25℃)	321	W
	Maximum Power Dissipation(T_C=100℃)	128	W
T_J, T_{STG}	Operating Junction and Storage Temperature Range	-55 To 175	℃

Table 2. Thermal Characteristic

Symbol	Parameter	Typ	Max	Unit
$R_{\theta JC}$	Thermal Resistance, Junction-to-Case		0.39	℃/W

Table 3. Electrical Characteristics (T_J=25℃ unless otherwise noted)

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
On/Off States						
BV_{DSS}	Drain-Source Breakdown Voltage	V_{GS}=0V I_D=500μA	650			V
I_{DSS}	Zero Gate Voltage Drain Current	V_{DS}=650V, V_{GS}=0V			100	μA
I_{GSS}	Gate-Body Leakage Current	V_{GS}=22V, V_{DS}=0V			100	nA
		V_{GS}=-10V, V_{DS}=0V			-100	nA
$V_{GS(th)}$	Gate Threshold Voltage	V_{DS}=V_{GS}, I_D=20mA	2		4.5	V
g_{FS}	Forward Transconductance	V_{DS}=20V, I_D=60A		40.8		S
$R_{DS(ON)}$	Drain-Source On-State Resistance	V_{GS}=18V, I_D=60A		15	21	mΩ
Dynamic Characteristics						
C_{iss}	Input Capacitance	V_{DS}=500V,V_{GS}=0V, f=100KHz		3525		pF
C_{oss}	Output Capacitance			297		pF
C_{rss}	Reverse Transfer Capacitance			16		pF
Rg	Gate resistance	V_{GS}=0V, V_{DS}=0V, f=1MHz		2.2		Ω
Switching Parameters						
$t_{d(on)}$	Turn-on Delay Time	V_{GS}=18V, V_{DS}=400V, R_L=6.7Ω, R_{GEN}=5.6Ω		28.8		nS
t_r	Turn-on Rise Time			25.7		nS
$t_{d(off)}$	Turn-Off Delay Time			60		nS
t_f	Turn-Off Fall Time			10.5		nS
Q_g	Total Gate Charge	V_{GS}=18V, V_{DS}=400V, I_D=60A		146		nC
Q_{gs}	Gate-Source Charge			45		nC
Q_{gd}	Gate-Drain Charge			36		nC
Source-Drain Diode Characteristics						
I_{SD}	Source-Drain Current (Body Diode)				118	A
V_{SD}	Forward on Voltage (Note 2)	V_{GS}=0V, I_S=60A			1.2	V
t_{rr}	Reverse Recovery Time	I_F=60A, dI/dt=100A/μs		29.5		ns
Q_{rr}	Reverse Recovery Charge	I_F=60A, dI/dt=100A/μs		303		nC

Notes 1.Repetitive Rating: Pulse width limited by maximum junction temperature.
Notes 2.E_{AS} condition: T_J=25℃,V_{DD}=400V,V_G=18V, Rg=50Ω, L=0.5mH.
Notes 3.Repetitive Rating: Pulse width limited by maximum junction temperature.

Typical Electrical And Thermal Characteristics (Curves)

Figure 1. On-Region Characteristics T_J = -40℃

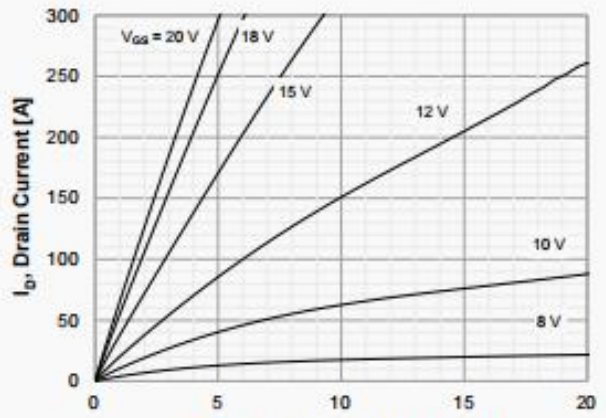


Figure 2. On-Region Characteristics T_J = 25℃

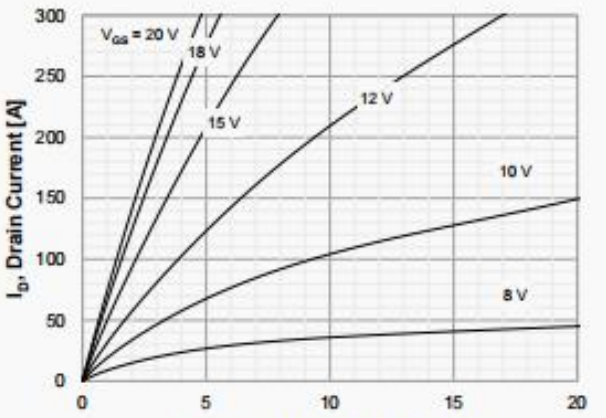


Figure 3. On-Region Characteristics T_J = 125℃

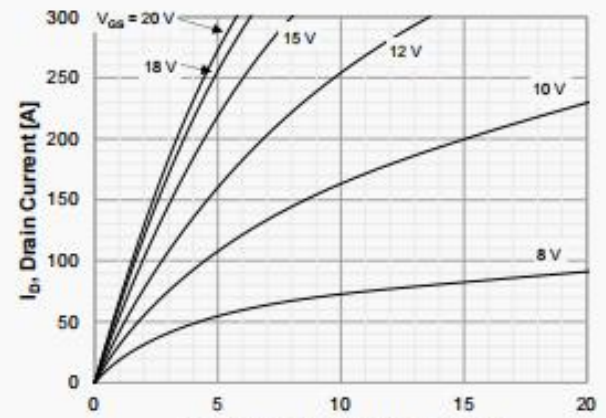


Figure 4. On-Region Characteristics T_J = 175℃

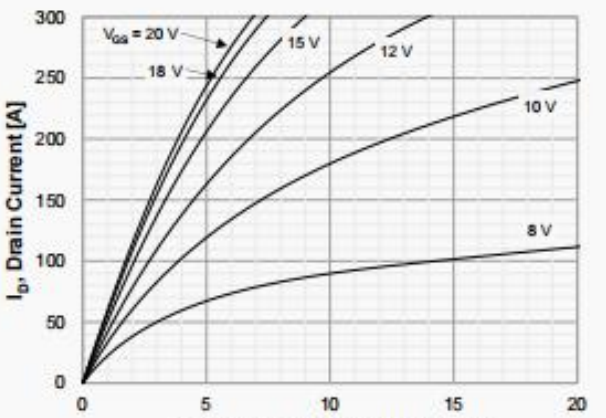


Figure 5. On-Resistance Characteristics vs. Temperature

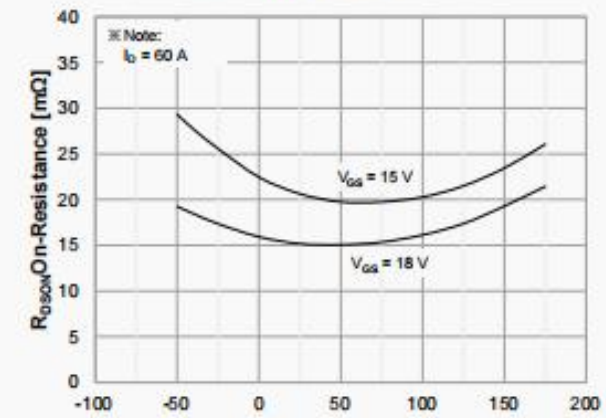
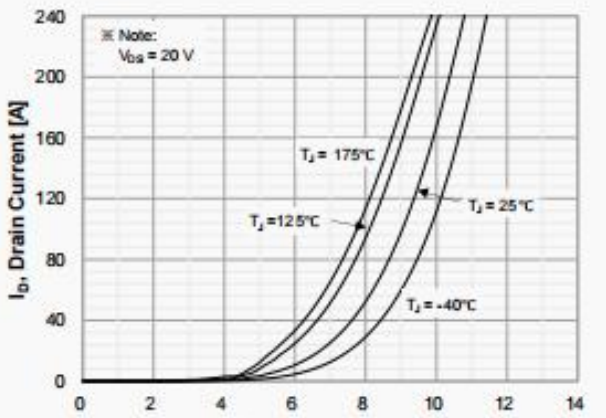


Figure 6. Transfer Characteristics



Typical Electrical And Thermal Characteristics (Curves)

Figure 7. Diode Forward Voltage Characteristics vs. Source-Drain Current T_J = -40℃

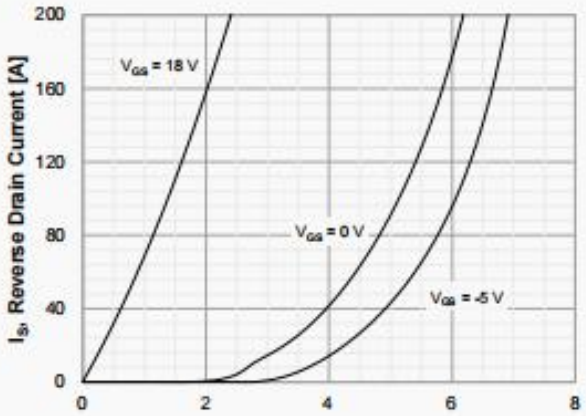


Figure 8. Diode Forward Voltage Characteristics vs. Source-Drain Current T_J = 25℃

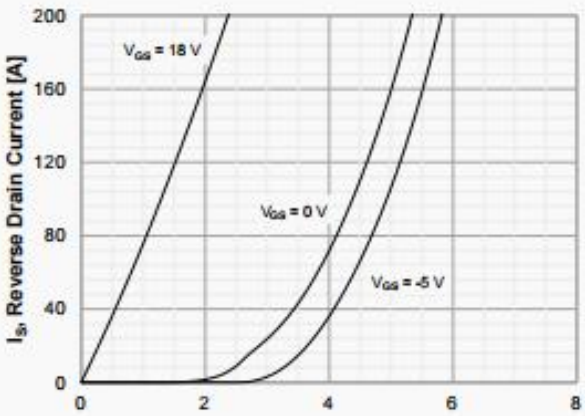


Figure 9. Diode Forward Voltage Characteristics vs. Source-Drain Current T_J = 125℃

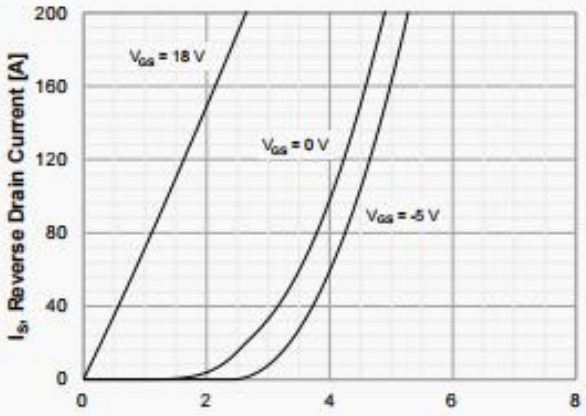


Figure 10. Diode Forward Voltage Characteristics vs. Source-Drain Current T_J = 175℃

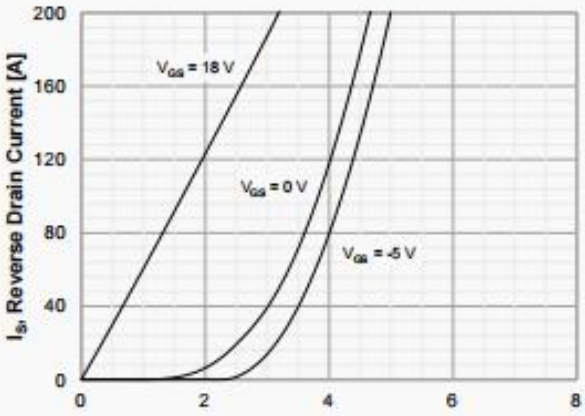


Figure 11. Threshold Voltage vs. Temperature

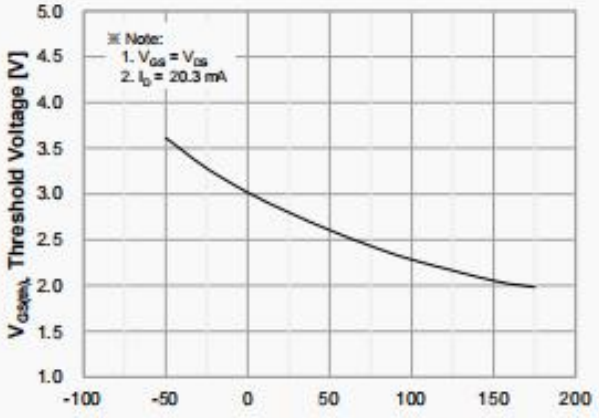
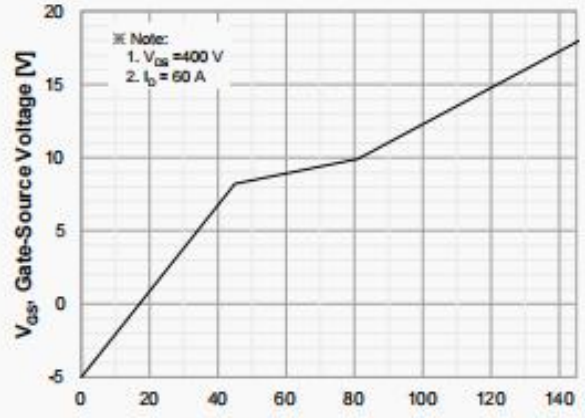


Figure 12. Gate Charge Characteristics



Typical Electrical And Thermal Characteristics (Curves)

Figure 13. Stored Energy in Output Capacitance

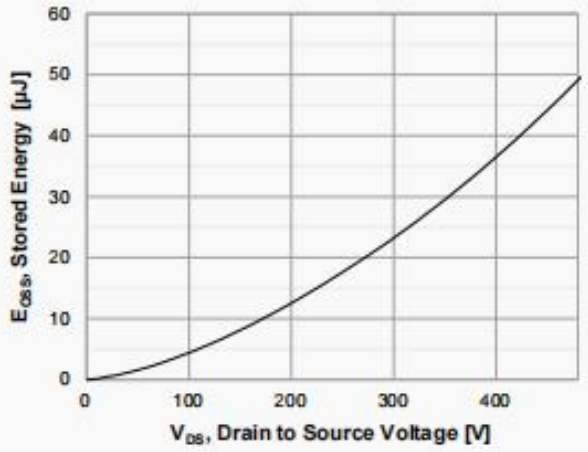


Figure 14. Capacitance Characteristics

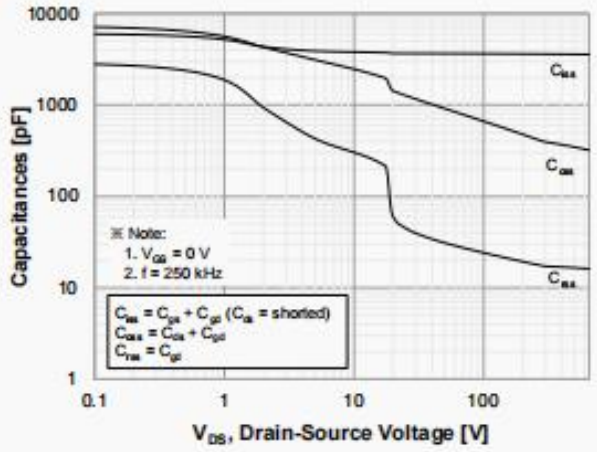


Figure 15. Continuous Drain Current Derating vs. Case Temperature

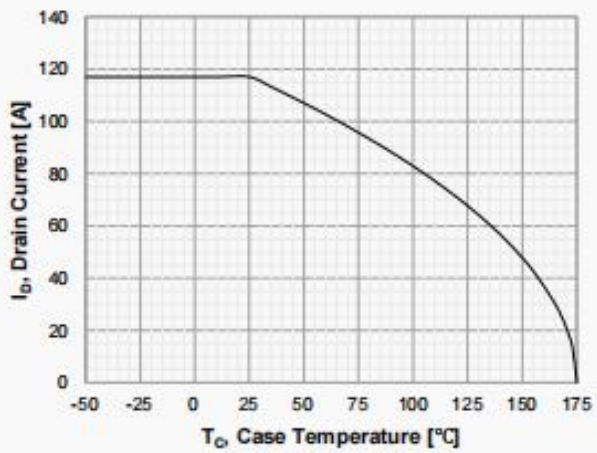


Figure 16. Maximum Power Dissipation Derating vs. Case Temperature

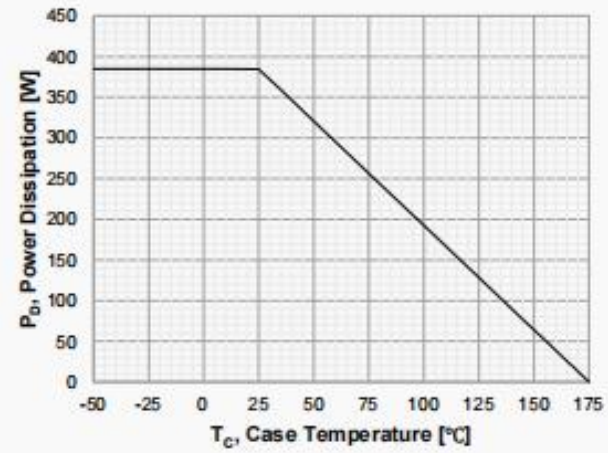


Figure 17. Typ. Switching Losses vs. Drain Current

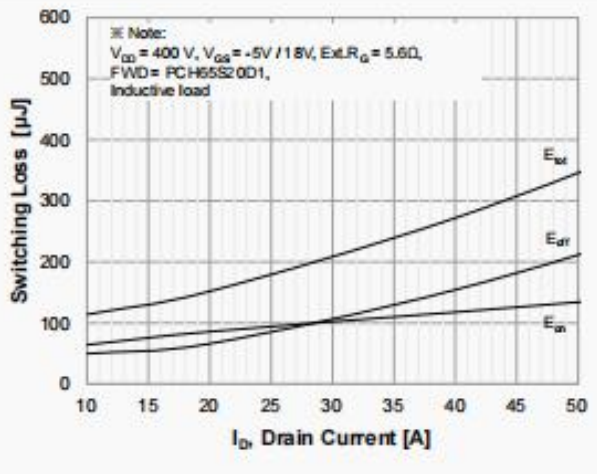
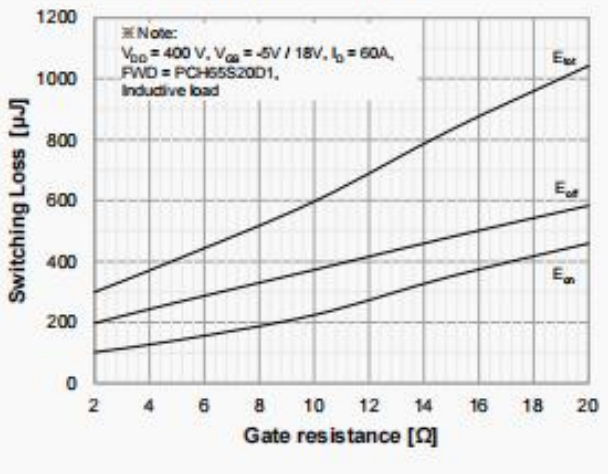


Figure 18. Typ. Switching Losses vs. Gate Resistance



Typical Electrical And Thermal Characteristics (Curves)

Figure 19. Typ. Switching Losses vs. Drain Current

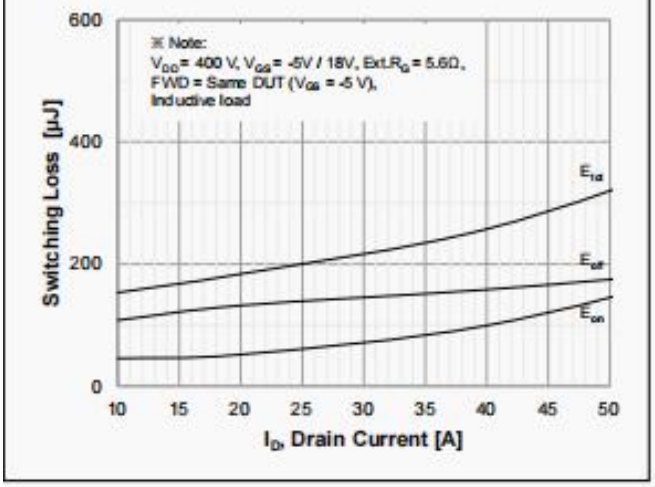


Figure 20. Typ. Switching Losses vs. Gate Resistance

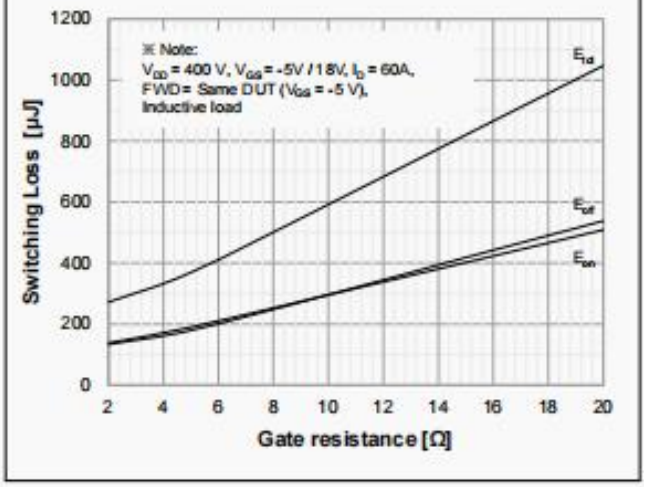


Figure 21. Maximum Safe Operating Area

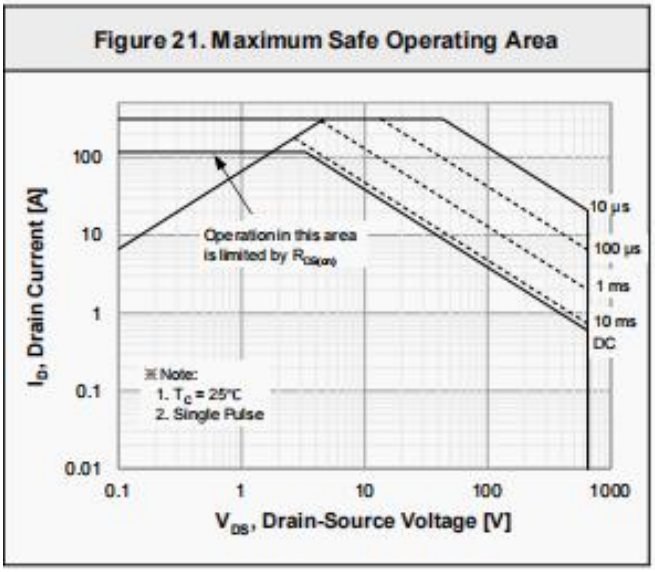
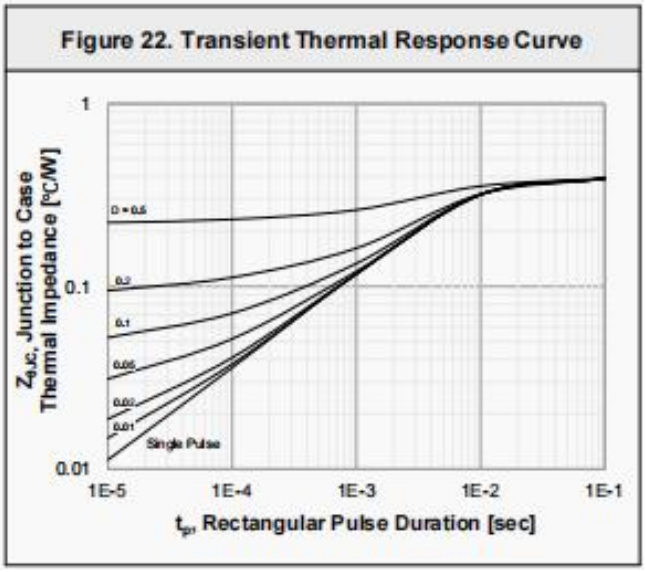
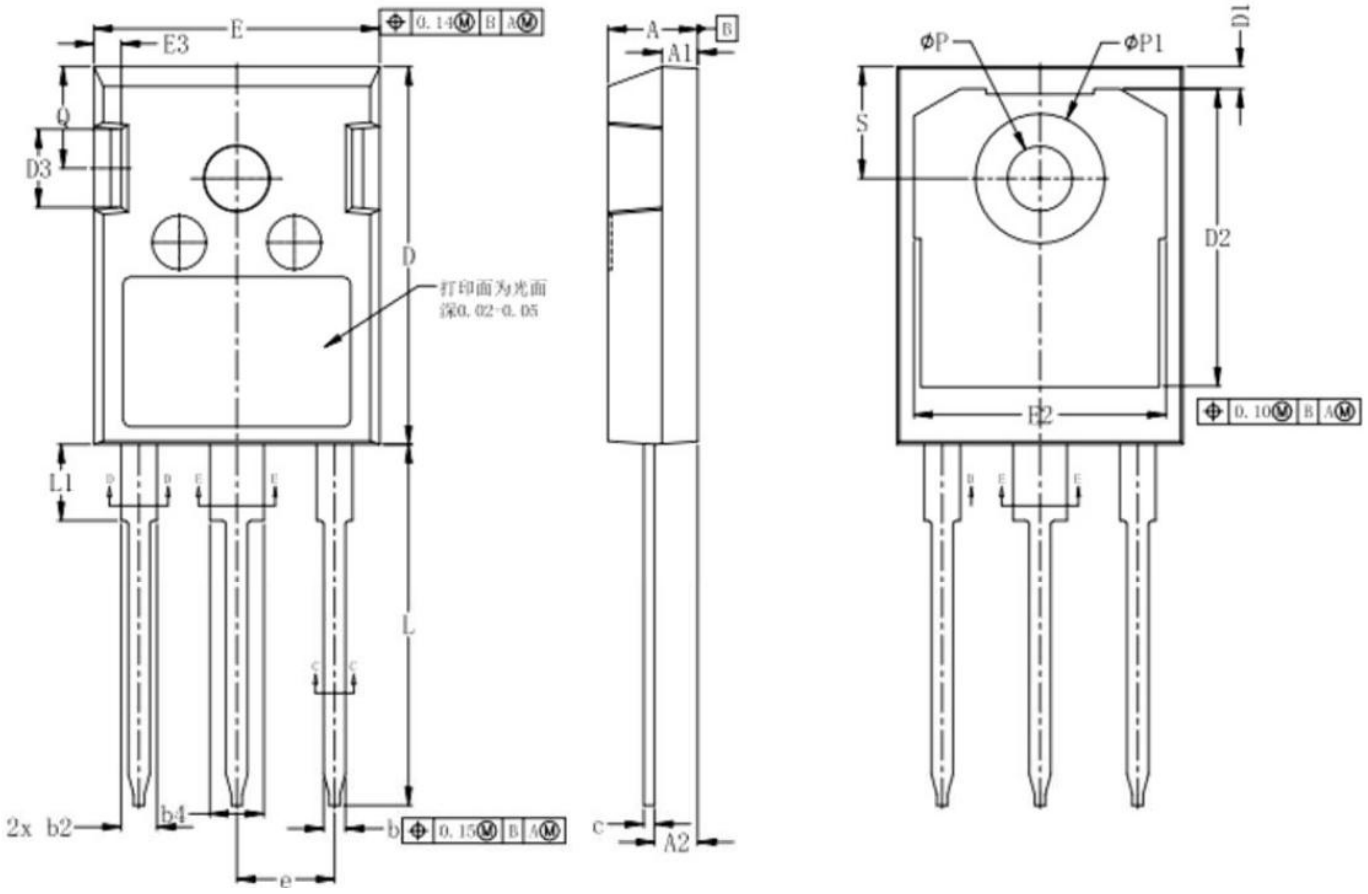


Figure 22. Transient Thermal Response Curve



TO-247 Package Information



DIM / SYMBOL	MIN.	NOM.	MAX.
A	4.900	5.000	5.100
A1	1.940	2.040	2.140
A2	2.300	2.400	2.500
b	1.139	1.239	1.330
b1	1.099	1.199	1.299
b2	1.939	2.039	2.139
b3	1.899	1.999	2.099
b4	2.940	3.040	3.140
b5	2.900	3.000	3.100
c	0.550	0.640	0.700
c1	0.500	0.600	0.700
D	20.850	20.950	21.050
D1	1.022	1.222	1.400
D2	16.348	16.548	16.748
D3	4.232	4.332	4.432
E	15.800	15.900	16.000
E2	13.821	14.021	14.221
E3	1.430	1.530	1.630
e	5.436 BSC.		
L	19.900	20.100	20.300
L1	4.024	4.224	4.424
ΦP	3.500	3.600	3.700
ΦP1	7.088	7.188	7.288
Q	5.435	5.635	5.835
S	6.040	6.200	6.300

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