



Product Summary

$V_{(BR)DSS}$	$R_{DS(on)TYP}$	I_D
650V	150mΩ@10V	24A

Feature

- Super-Junction MOSFET
- High Ruggedness
- Low RDS(ON)
- 100% Avalanche Tested
- Improved dv/dt Capability

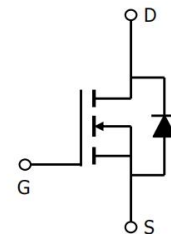
Application

- PFC/LLC
- PC Power
- LED Lighting

PIN Description



Schematic diagram



Package Marking and Ordering Information

Part Number	Package	Marking	Packing	Reel Size	Tape Width	Qty
GPJE65R180TC	TO-220F	JE65R180T	Tape&Reel	NA	NA	50PCS

ABSOLUTE MAXIMUM RATINGS ($T_A = 25^\circ\text{C}$ unless otherwise noted)

Parameter	Symbol	Value	Unit
Drain-Source Voltage	V_{DS}	650	V
Gate-Source Voltage	V_{GS}	±30	V
Continuous Drain Current(Note1)	$T_C = 25^\circ\text{C}$	I_D	24
	$T_C = 100^\circ\text{C}$	I_D	15
Pulsed Drain Current(Note1)	I_{DM}	96	A
Single Pulsed Avalanche Energy(Note2)	E_{AS}	589	mJ
Power Dissipation TO-220F	P_D	$T_C = 25^\circ\text{C}$	28
Power Dissipation TO-247-3L		$T_C = 25^\circ\text{C}$	205
MOSFET dv/dt Ruggedness($V_{DS}=0\sim 480\text{V}$)	dv/dt	50	V/ns
Peak Diode Recovery dv/dt($V_{DS}=0\sim 400\text{V}$, $I_{SD}\leq I_S$)	dv/dt	15	V/ns
Thermal Resistance, Junction to Case TO-220F	R_{thjc}	4.5	$^\circ\text{C}/\text{W}$
Thermal Resistance, Junction to Case TO-247-3L		0.61	$^\circ\text{C}/\text{W}$
Thermal Resistance, Junction to Ambient TO-220F	R_{thja}	62.5	$^\circ\text{C}/\text{W}$
Thermal Resistance, Junction to Ambient TO-247-3L		50	$^\circ\text{C}/\text{W}$
Junction Temperature	T_J	-55~ +150	$^\circ\text{C}$
Storage Temperature	T_{STG}	-55~ +150	$^\circ\text{C}$

MOSFET ELECTRICAL CHARACTERISTICS ($T_A = 25^\circ\text{C}$ unless otherwise noted)

Parameter	Symbol	Test Condition	Min	Type	Max	Unit
Off Characteristics						
Drain-Source Breakdown Voltage	BV_{DSS}	$V_{GS} = 0V, I_D = 250\mu A$	650			V
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS} = 650V, V_{GS} = 0V, T_J = 25^\circ\text{C}$			1	μA
		$V_{DS} = 650V, V_{GS} = 0V, T_J = 125^\circ\text{C}$		1.5		μA
Gate - Body Leakage Current	I_{GSS}	$V_{GS} = \pm 20V, V_{DS} = 0V$			± 100	nA
On Characteristics						
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS} = V_{GS}, I_D = 250\mu A$	3		4	V
Drain-Source On-Resistance	$R_{DS(on)}$	$V_{GS} = 10V, I_D = 12A$		150	180	$m\Omega$
Dynamic Characteristics						
Input Capacitance	C_{iss}	$V_{DS} = 100V, V_{GS} = 0V, f = 1\text{MHz}$		1441		pF
Output Capacitance	C_{oss}			64		
Reverse Transfer Capacitance	C_{rss}			2.7		
Gate Resistance	R_g	$V_{DS} = 0V, V_{GS} = 0V, f = 1\text{MHz}$		1.1		Ω
Switching Characteristics						
Total Gate Charge	Q_g	$V_{DS} = 520V, V_{GS} = 10V, I_D = 12A$		42		nC
Gate-Source Charge	Q_{gs}			10		
Gate-Drain Charge	Q_{gd}			21		
Turn-On Delay Time	$t_{d(on)}$	$V_{DS} = 325V, V_{GS} = 10V, I_D = 12A, R_G = 24\Omega$		22		ns
Turn-On Rise Time	t_r			39		
Turn-Off Delay Time	$t_{d(off)}$			104		
Turn-Off Fall Time	t_f			34		
Source-Drain Diode Characteristics						
Diode Forward Voltage	V_{SD}	$V_{GS} = 0V, I_S = 12A$			1.4	V
Body Diode Reverse Recovery Time	t_{rr}	$I_S = 12A, di/dt = 100A/\mu s, V_{GS} = 0V, V_R = 50V$		346		ns
Body Diode Reverse Recovery Charge	Q_{rr}			4.7		μC
Reverse Recovery Of Peak Current	I_{rrm}			27		A

Notes :

1. Drain current is limited by maximum junction temperature.
2. $L = 79\text{mH}, V_{DD} = 100V, R_G = 25\Omega$, Starting at $T_J = 25^\circ\text{C}$

Typical Characteristics

图 1. 输出特性

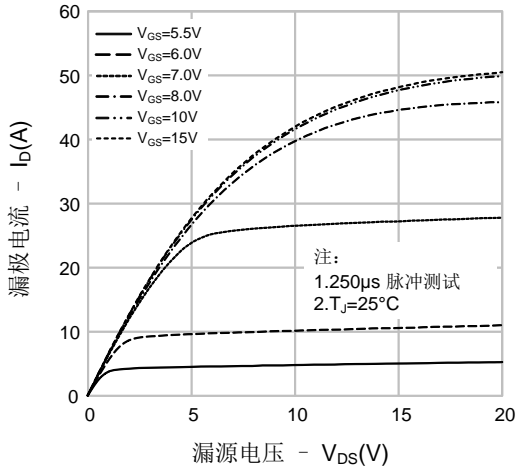


图 2. 输出特性

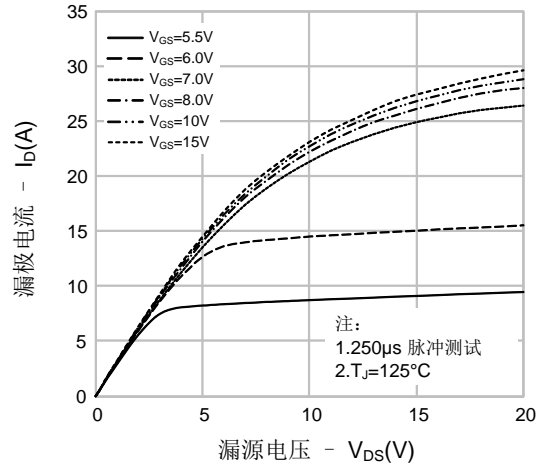


图 3. 传输特性

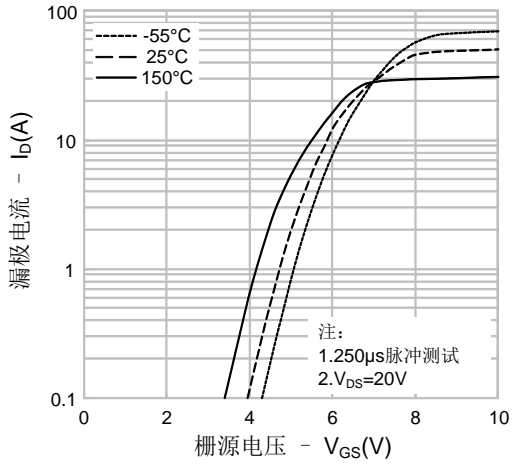


图 4. 导通电阻 vs. 漏极电流

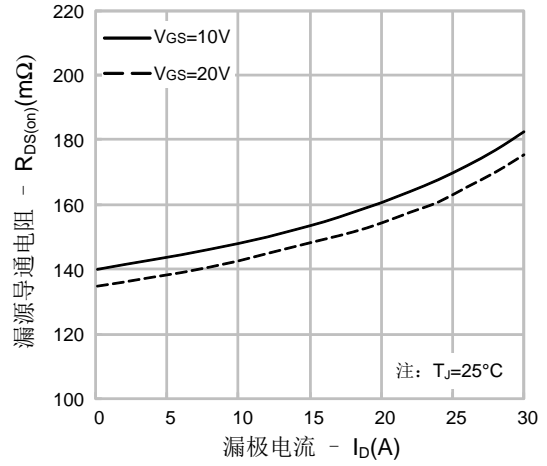


图 5. 导通电阻 vs. 漏极电流

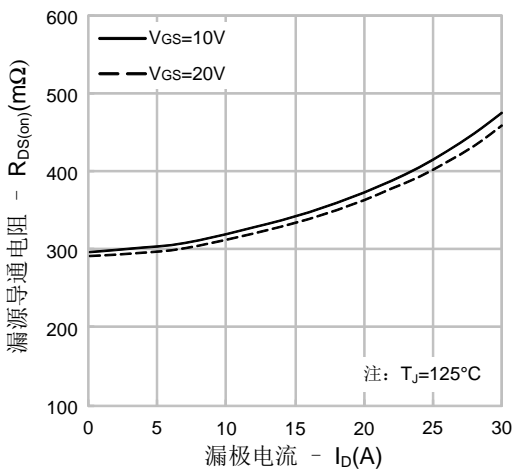


图 6. 导通电阻 vs. 栅源电压

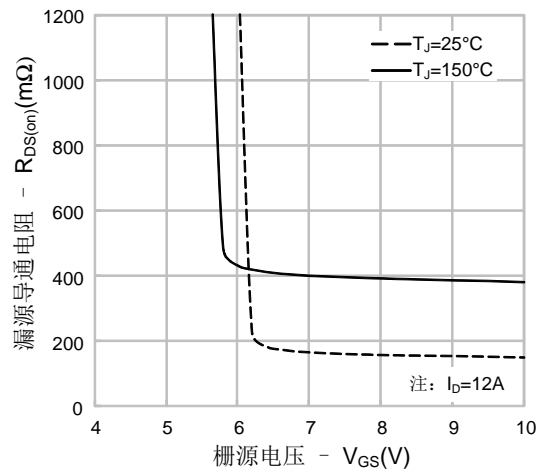


图 7. 开启电压 vs. 温度特性

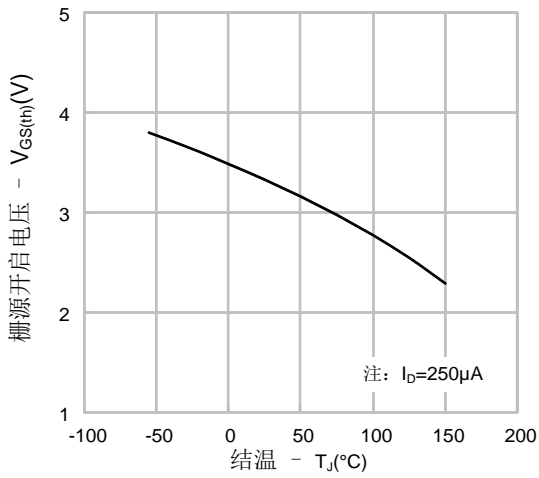


图 8. 体二极管正向压降 vs. 源极电流、温度

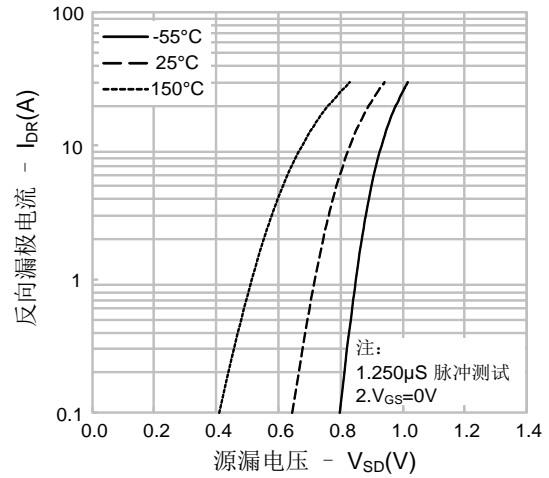


图9. 电容特性

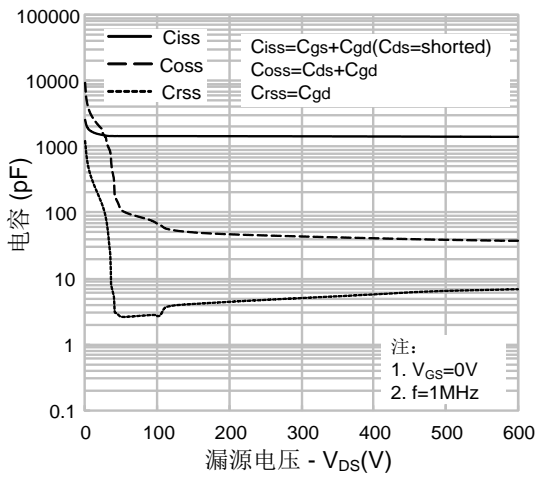


图 10. 电荷量特性

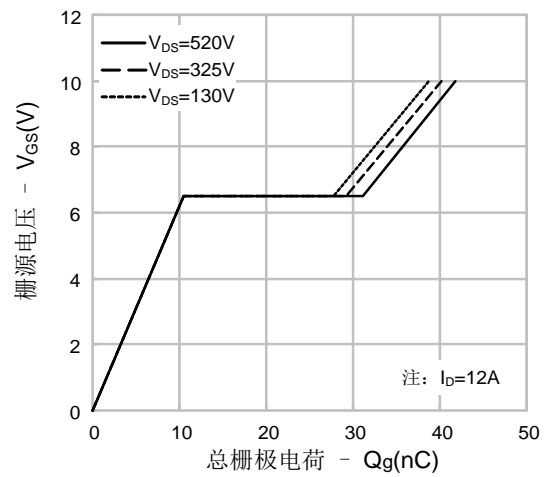


图 11. 击穿电压 vs. 温度特性

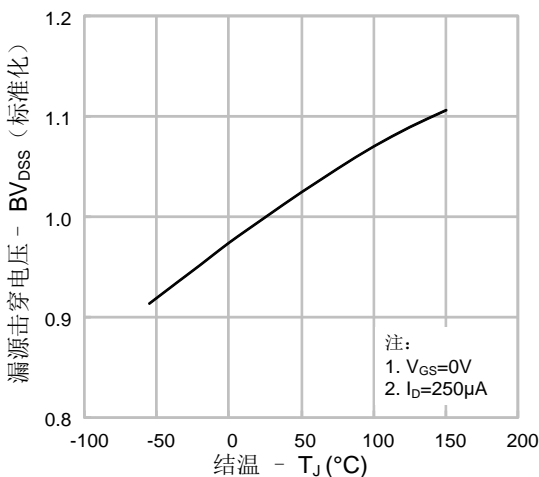


图 12. 导通电阻 vs. 温度特性

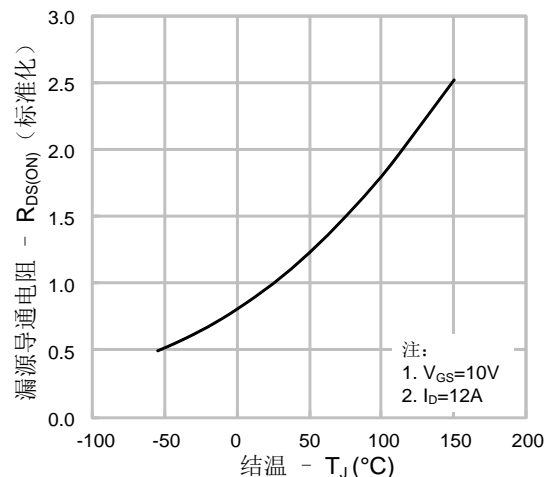


图 13-1. 最大安全工作区域(GPJE65R160TC)

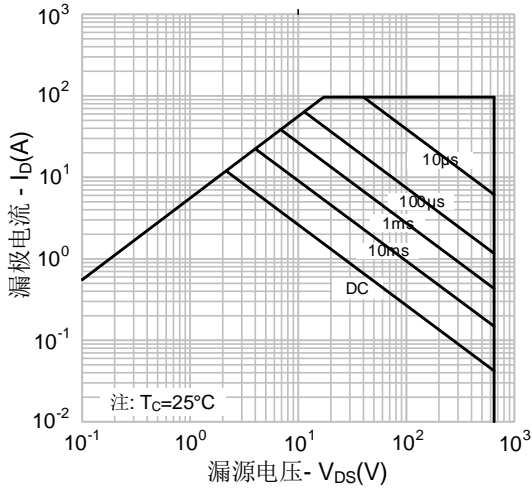


图 13-2. 最大安全工作区域(GPJE65R160TD)

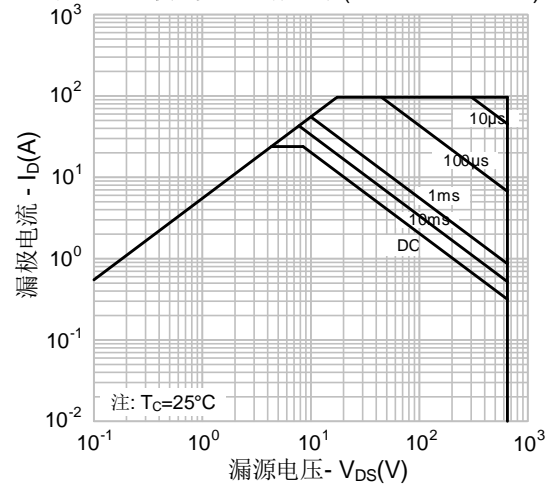


图14-1. 耗散功率vs.温度(GPJE65R180TC)

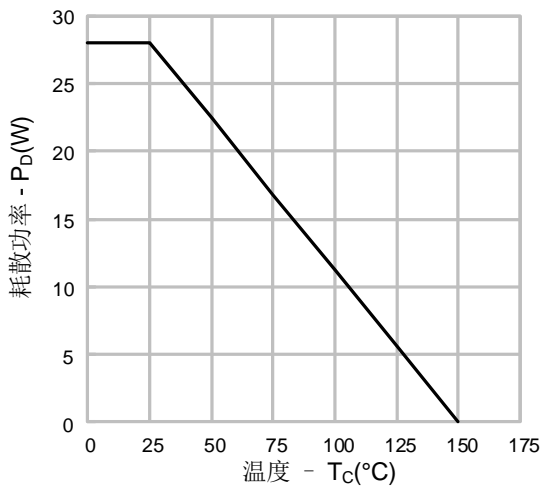


图14-2. 耗散功率vs.温度(GPJE65R180TD)

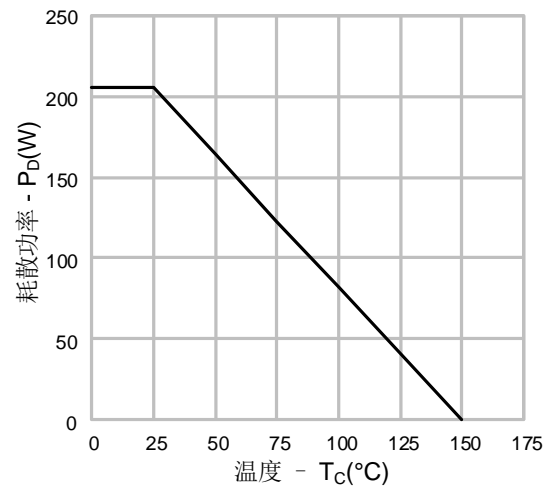


图15-1.瞬态热阻抗 vs. 脉冲宽度 (GPJE65R180TC)

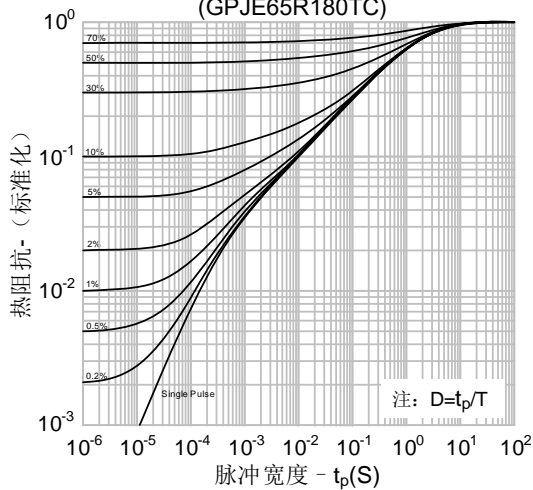
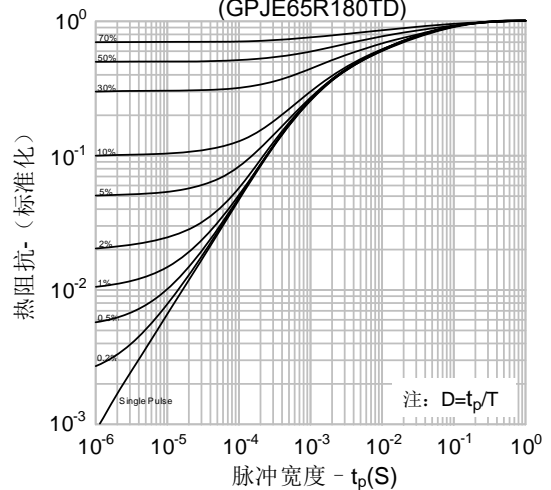
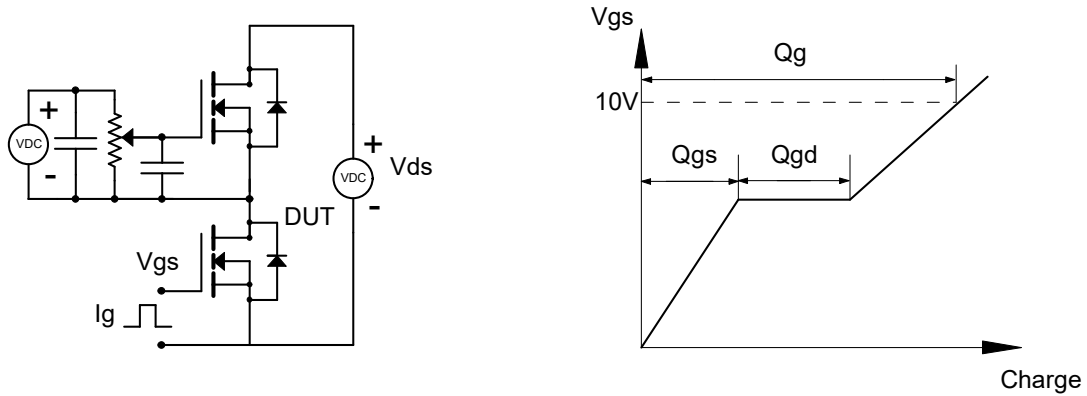


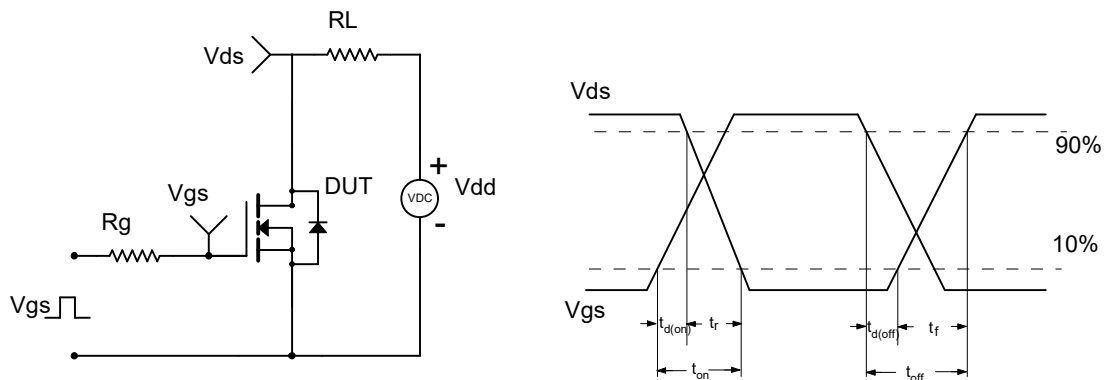
图15-2.瞬态热阻抗 vs. 脉冲宽度 (GPJE65R180TD)



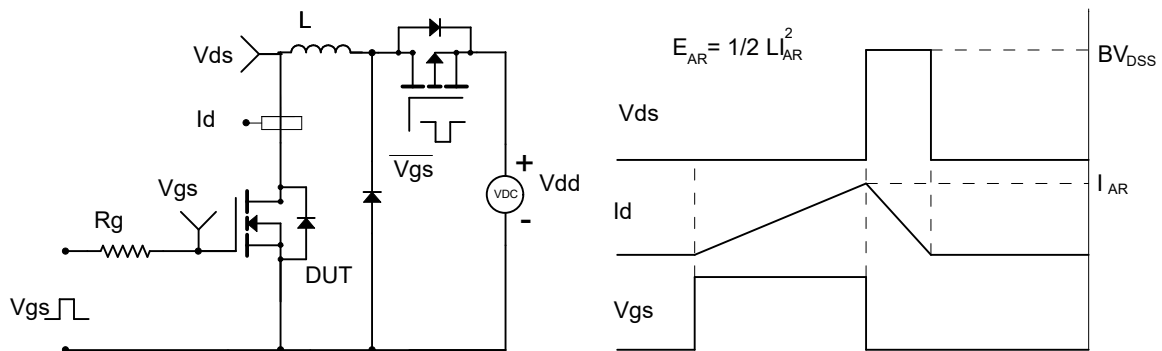
Gate Charge Test Circuit & Waveform



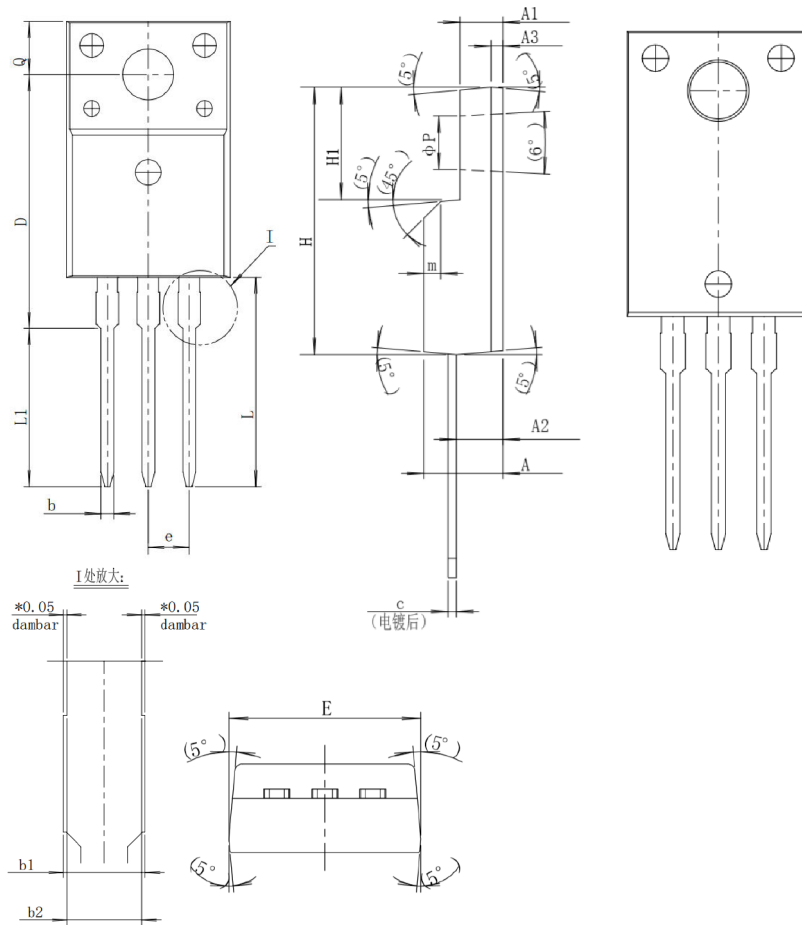
Resistive Switching Test Circuit & Waveform



Unclamped Inductive Switching (UIS) Test Circuit & Waveforms



TO220F Package Information



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	4.600	4.800	0.181	0.189
A1	2.440	2.640	0.096	0.104
A2	2.650	2.850	0.104	0.112
A3	0.700		0.028	
b	0.700	0.900	0.028	0.035
b1	1.280	1.470	0.050	0.058
b2	1.180	1.390	0.046	0.055
c	0.450	0.600	0.018	0.024
D	15.640	15.850	0.616	0.624
E	10.060	12.260	0.396	0.483
e	2.540		0.100	
H	15.770	15.970	0.621	0.629
H1	6.580	6.780	0.259	0.267
L	12.680	13.280	0.499	0.523
L1	9.600	10.000	0.378	0.394
Q	3.200	3.400	0.126	0.134
ΦP	3.080	3.280	0.121	0.129
m	0.500	1.500	0.020	0.059

Attention:

- GreenPower Electronics reserves the right to improve product design function and reliability without notice.
- Any and all semiconductor products have certain probability to fail or malfunction, which may result in personal injury, death or property damage. Customer are solely responsible for providing adequate safe measures when design their systems.
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