HIGH DIODE

JE65R180TC

RoHS COMPLIANT

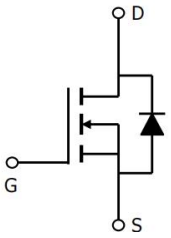
650V N-Channel MOSFET

Product Summary

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

PIN Description

Schematic diagram



Feature

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

Application

- PFC/LLC
- PC Power
- LED Lighting

Package Marking and Ordering Information

Part Number	Package	Marking	Packing	Reel Size	Tape Width	Qty
JE65R180TC	TO-220F	JE65R180T	Tape&Reel	NA	NA	50PCS

ABSOLUTE MAXIMUM RATINGS (T_A = 25℃ 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℃	I_D	24	A
	T_C = 100℃	I_D	15	A
Pulsed Drain Current(Note1)		I_{DM}	96	A
Single Pulsed Avalanche Energy(Note2)		E_{AS}	589	mJ
Power Dissipation TO-220F	T_C = 25℃	P_D	28	W
Power Dissipation TO-247-3L	T_C = 25℃		205	W
MOSFET dv/dt Ruggedness(V_{DS}=0~480V)		dv/dt	50	V/ns
Peak Diode Recovery dv/dt(V_{DS}=0~400V, I_{SD}≤I_S)		dv/dt	15	V/ns
Thermal Resistance, Junction to Case TO-220F		R_{thjc}	4.5	℃/W
Thermal Resistance, Junction to Case TO-247-3L			0.61	℃/W
Thermal Resistance, Junction to Ambient TO-220F		R_{thja}	62.5	℃/W
Thermal Resistance, Junction to Ambient TO-247-3L			50	℃/W
Junction Temperature		T_J	-55~ +150	℃
Storage Temperature		T_{STG}	-55~ +150	℃

Electrical Characteristics (T_A=25℃ unless otherwise noted)

Parameter	Symbol	Test Condition	Min	Type	Max	Unit
Off Characteristics						
Drain-Source Breakdown Voltage	BV_{DSS}	V_{GS} = 0V, I_D = 250μA	650			V
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS} = 650V, V_{GS} = 0V, T_J=25℃			1	μA
		V_{DS} = 650V, V_{GS} = 0V, T_J=125℃		1.5		μA
Gate - Body Leakage Current	I_{GSS}	V_{GS} = ±20V, V_{DS} = 0V			±100	nA
On Characteristics						
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS} = V_{GS}, I_D = 250μA	3		4	V
Drain-Source On-Resistance	$R_{DS(on)}$	V_{GS} = 10V, I_D =12A		150	180	mΩ
Dynamic Characteristics						
Input Capacitance	C_{iss}	V_{DS} = 100V, V_{GS} = 0V, f = 1MHz		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 = 1MHz		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 = 24Ω		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/μs,V_{GS} = 0V, V_R=50V		346		ns
Body Diode Reverse Recovery Charge	Q_{rr}			4.7		uC
Reverse Recovery Of Peak Current	Irrm			27		A

Notes :

1. Drain current is limited by maximum junction temperature.

2 . L = 79mH, V_{DD} = 100V, R_G=25Ω, Starting at T_J = 25℃

Typical Characteristics

图 1. 输出特性

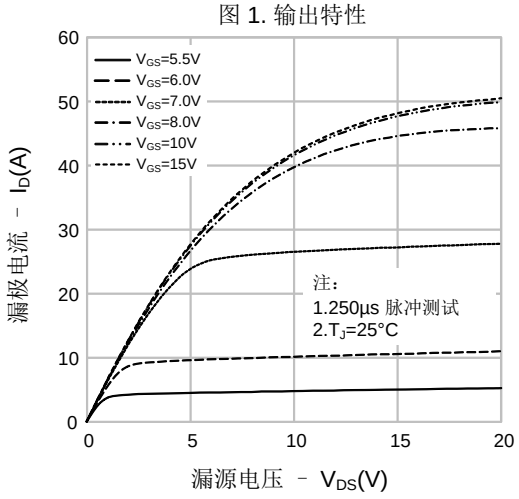


图 2. 输出特性

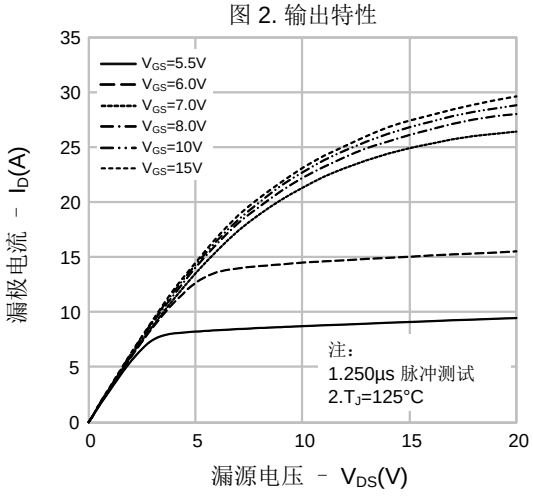


图 3. 传输特性

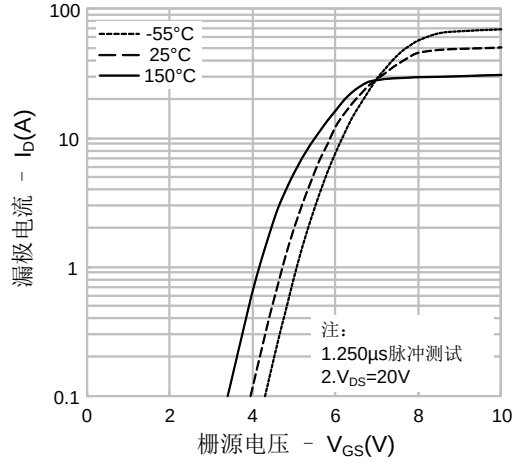


图 4. 导通电阻vs.漏极电流

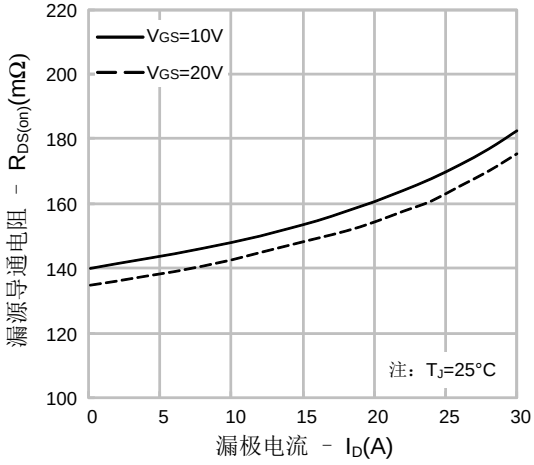


图 5. 导通电阻vs.漏极电流

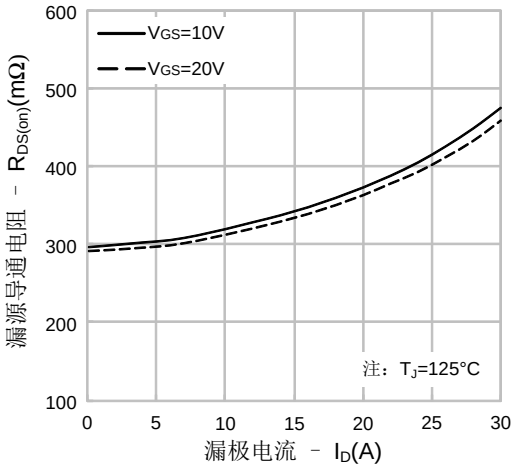
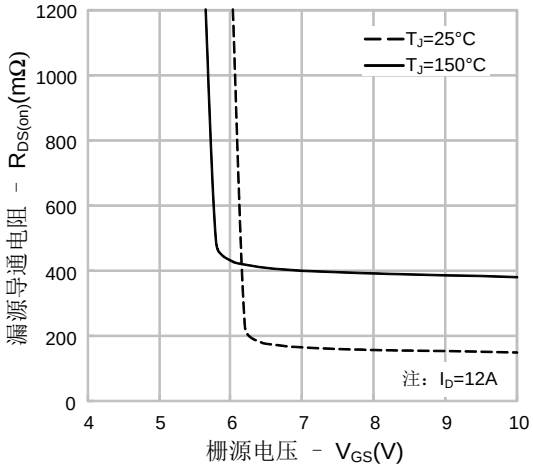


图 6. 导通电阻vs.栅源电压



Typical Characteristics

图 7. 开启电压vs.温度特性

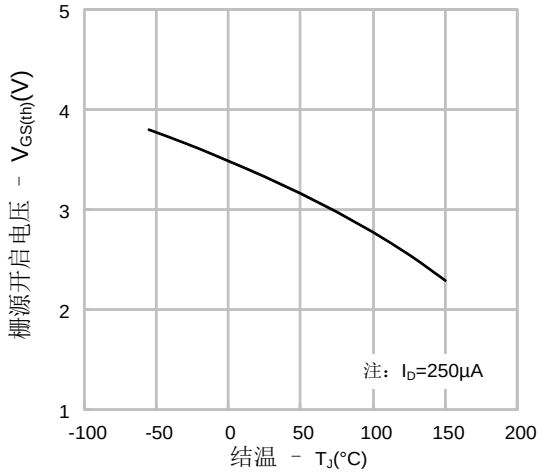


图 8. 体二极管正向压降vs. 源极电流、温度

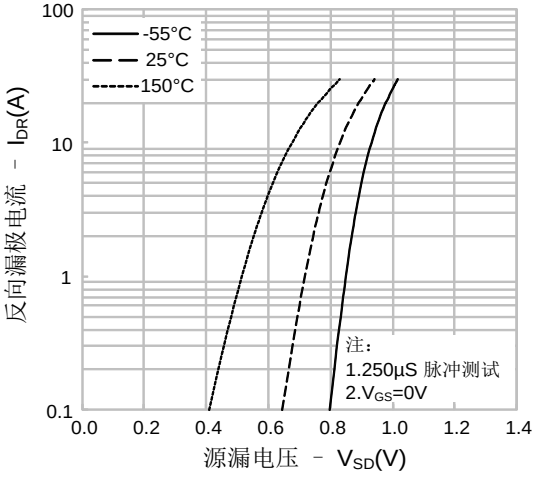


图9. 电容特性

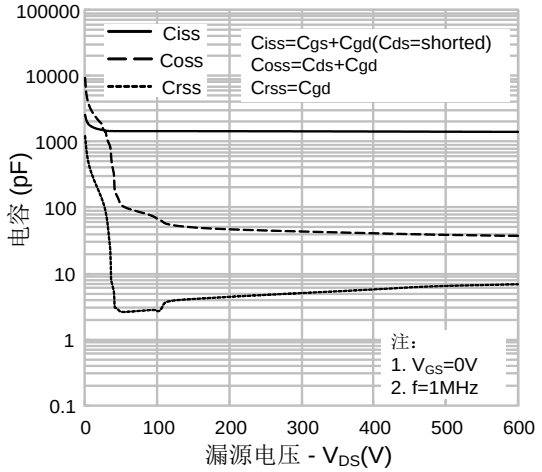


图 10. 电荷量特性

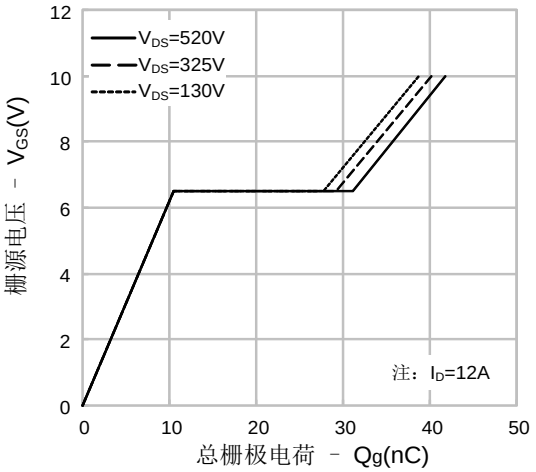


图 11. 击穿电压vs.温度特性

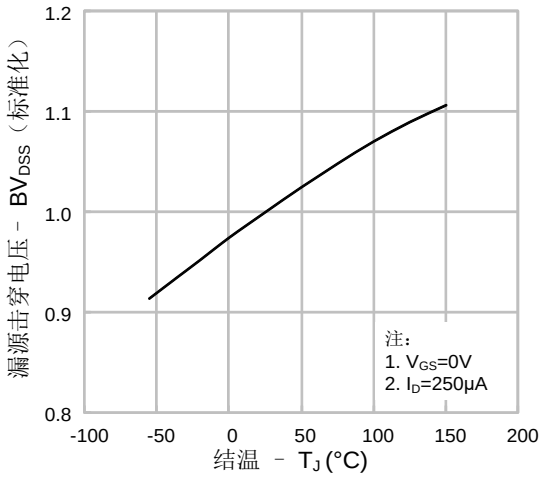
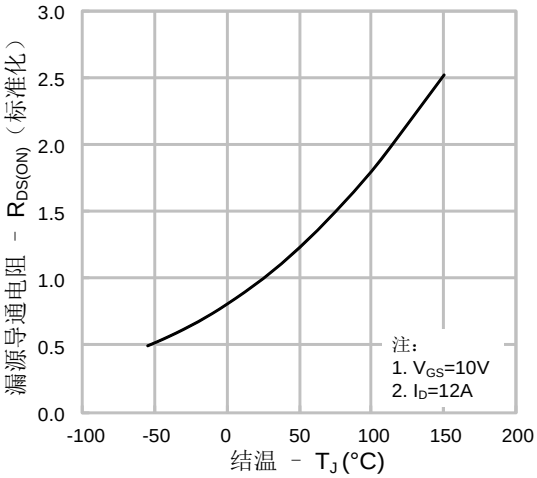


图 12. 导通电阻vs.温度特性



Typical Characteristics

图 13-1. 最大安全工作区域(GPJE65R160TC)

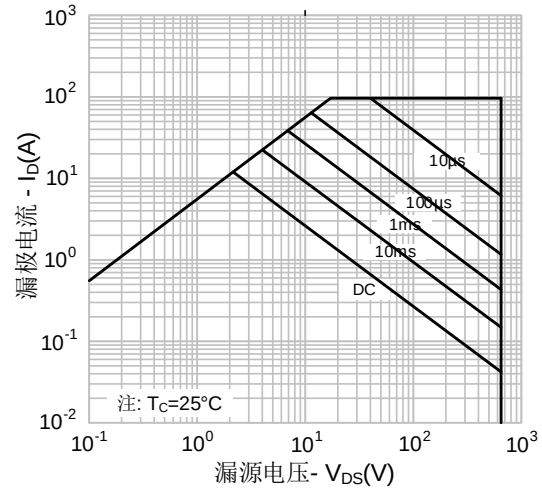


图 13-2. 最大安全工作区域(GPJE65R160TD)

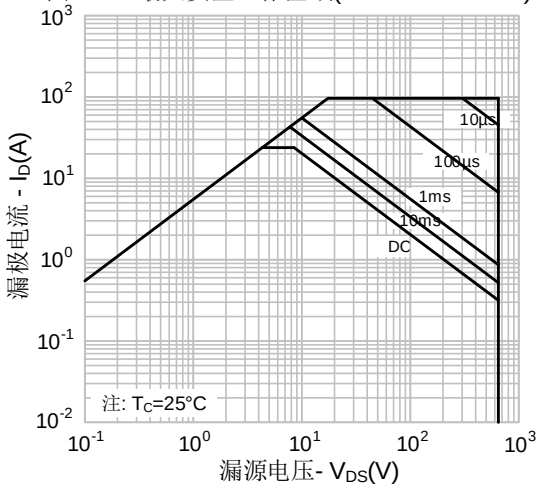


图14-1. 耗散功率vs.温度(GPJE65R180TC)

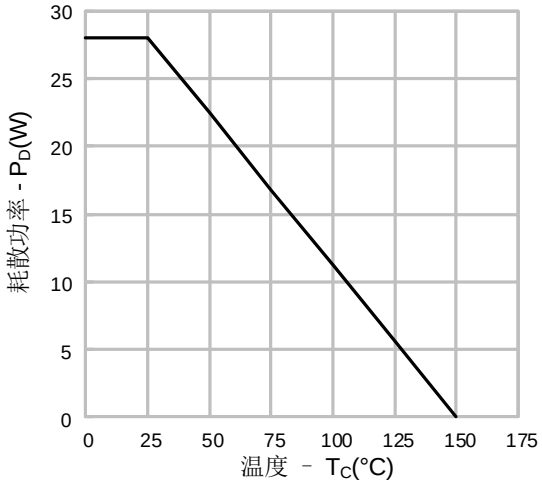


图14-2. 耗散功率vs.温度(GPJE65R180TD)

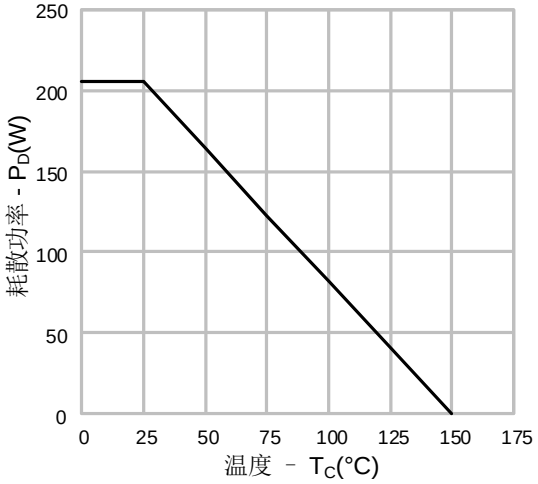


图15-1.瞬态热阻抗 vs. 脉冲宽度 (GPJE65R180TC)

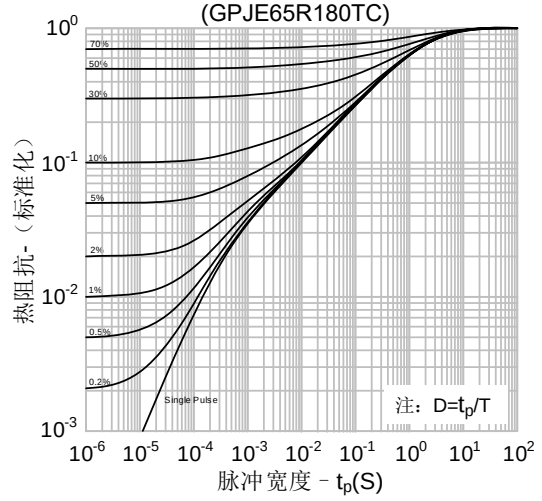
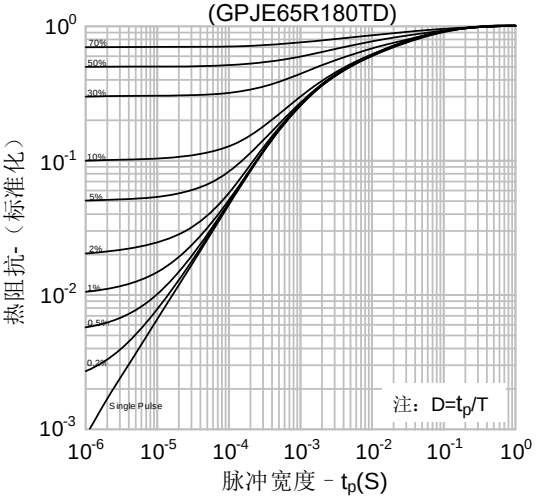
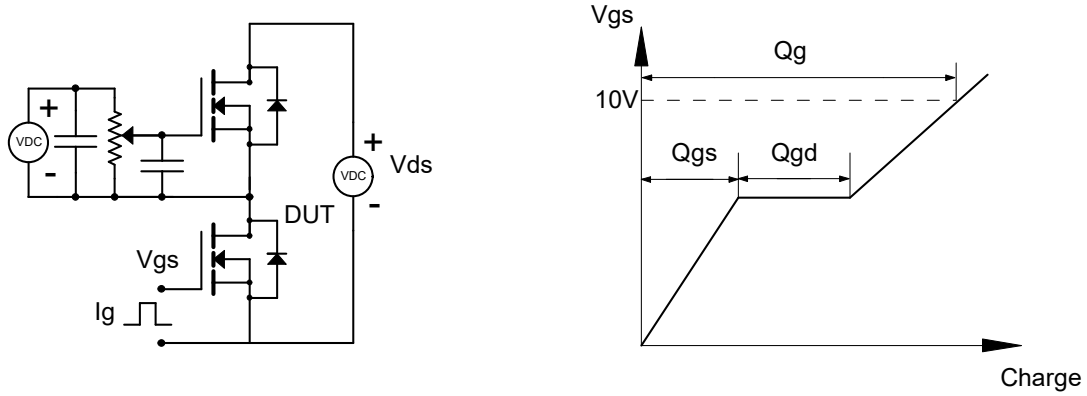


图15-2.瞬态热阻抗 vs. 脉冲宽度 (GPJE65R180TD)

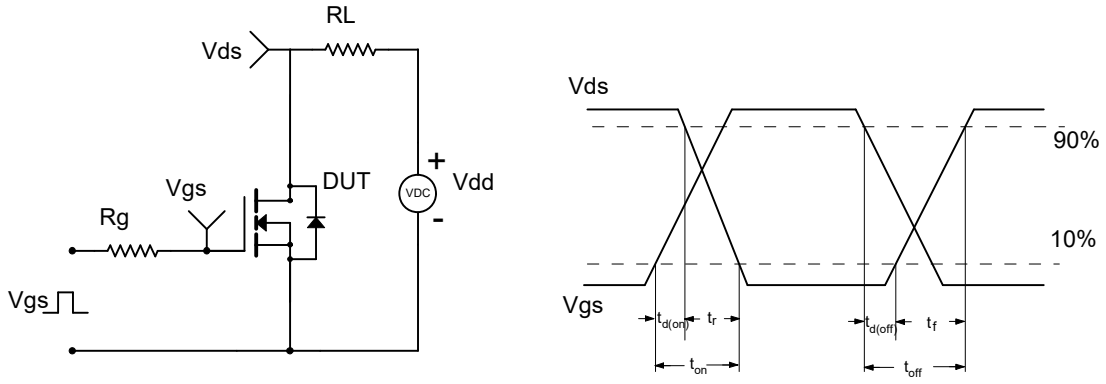


Typical Characteristics

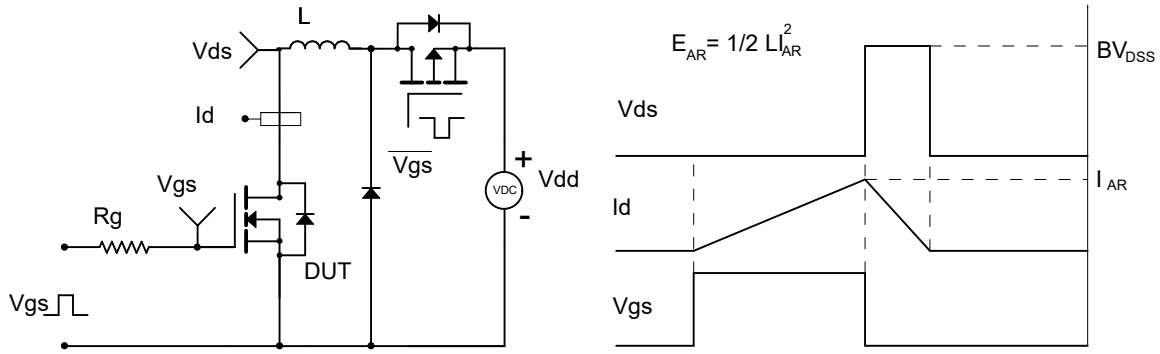
Gate Charge Test Circuit & Waveform

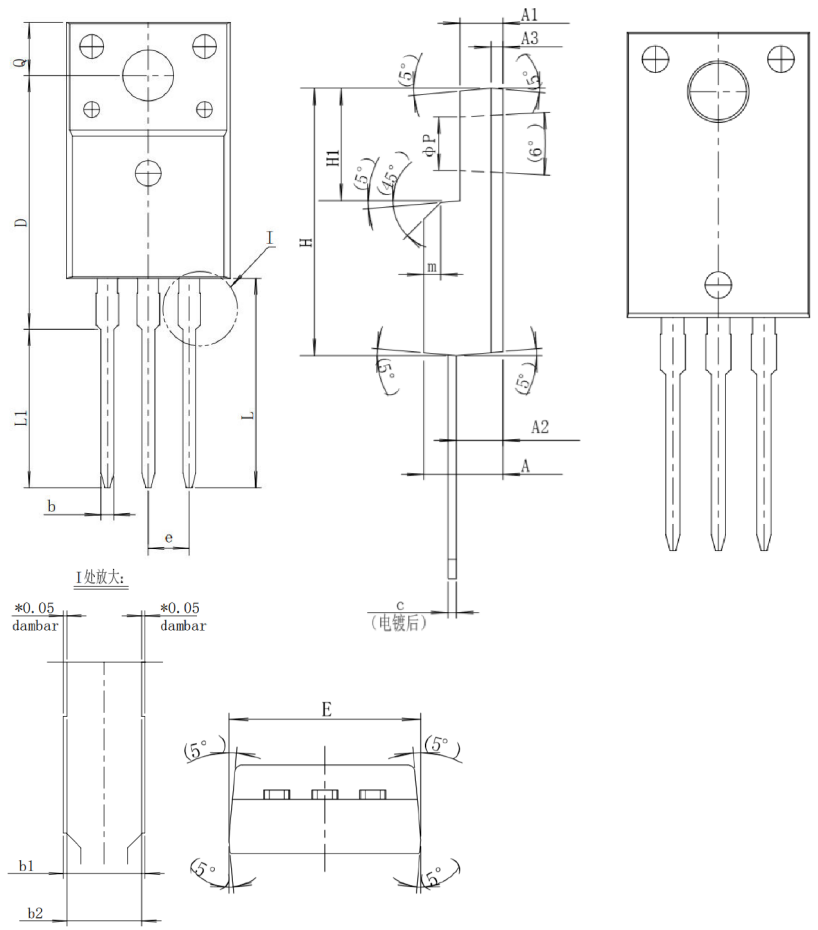


Resistive Switching Test Circuit & Waveform



Unclamped Inductive Switching (UIS) Test Circuit & Waveforms





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