

Product Summary

Part #	V_{DS}	$R_{DS(on).typ}$	I_D
DP65R380AJ	650V	0.32Ω	11A

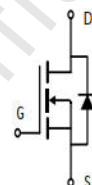
Features

- Super_Junction technology
- Low conduction resistance, superior switching performance
- High avalanche energy
- Better efficiency due to very low FOM

Applications

- Power factor correction
- Charger
- LED Lighting

TO-220F



100% Avalanche Tested

100% Rg Tested

Package Marking and Ordering Information

Part #	Marking	Package	Packing
DP65R380AJ	65R380AJ	TO-220F	Tube



Halogen-Free

Absolute Maximum Ratings

Parameter	Symbol	Value	Unit
Drain-source voltage	V_{DS}	650	V
Continuous drain current	I_D	11	A
$T_C = 25^\circ\text{C}$		7.1	
$T_C = 100^\circ\text{C}$			
Pulsed drain current ($T_C = 25^\circ\text{C}$, t_p limited by T_{jmax})	$I_{D \text{ pulse}}$	33	A
Avalanche energy, single pulse ($L=40\text{mH}$, $R_g=25$) ^[1]	E_{AS}	198	mJ
Peak diode recovery dv/dt ^[2]	dv/dt	50	V/ns
Gate-Source voltage	V_{GS}	±30	V
Power dissipation ($T_C = 25^\circ\text{C}$)	P_{tot}	30	W
Operating junction and storage temperature	T_J, T_{stg}	-55...+150	°C

[1]. EAS is tested at starting $T_J = 25^\circ\text{C}$, $V_{GS} = 10\text{V}$.

[2]. Identical low side and high side switch with identical R_g

Parameter	Symbol	Max	Unit
Thermal resistance, junction – case.	R_{thJC}	4.2	°C/W
Thermal resistance, junction – ambient(min. footprint)	R_{thJA}	62	

Electrical Characteristic (at $T_j = 25^\circ\text{C}$, unless otherwise specified)

Parameter	Symbol	Value			Unit	Test Condition
		min.	typ.	max.		

Static Characteristic

Drain-source breakdown voltage	BV_{DSS}	650	-	-	V	$V_{GS}=0V, I_D=250\mu A$
Gate threshold voltage	$V_{GS(th)}$	3	3.7	4.5	V	$V_{DS}=V_{GS}, I_D=250\mu A$
Zero gate voltage drain current	I_{DSS}	-	-	1	μA	$V_{DS}=650V, V_{GS}=0V$ $T_j=25^\circ\text{C}$
		-	-	100		$T_j=125^\circ\text{C}(V_{DS}=520V)$
Gate-source leakage current	I_{GSS}	-	-	± 100	nA	$V_{GS}=\pm 30V, V_{DS}=0V$
Drain-source on-state resistance	$R_{DS(on)}$	-	0.32	0.38	Ω	$T_j=25^\circ\text{C}$ $V_{GS}=10V, I_D=5.5A$
Gate resistance	R_g	-	3	-	Ω	$V_{GS}=0V, V_{DS}=0V$, $f=1\text{MHz}$
Transconductance ^[2]	g_{fs}	-	7	-	S	$V_{DS}=20V, I_D=5.5A$

Dynamic Characteristic^[3]

Input Capacitance	C_{iss}	-	912	-	pF	$V_{GS}=0V, V_{DS}=40V$, $f=1\text{MHz}$
Output Capacitance	C_{oss}	-	85	-		
Reverse Transfer Capacitance	C_{rss}	-	1.6	-		
Gate Total Charge($V_{GS}=10V$)	Q_g	-	20	-	nC	$V_{GS}=10V, V_{DS}=520V$, $I_D=5.5A, f=1\text{MHz}$
Gate-Source charge	Q_{gs}	-	3.5	-		
Gate-Drain charge	Q_{gd}	-	9	-		
Turn-on delay time	$t_{d(on)}$	-	21	-	ns	$V_{GS}=15V, V_{DD}=400V$, $R_{G_ext}=10\Omega$
Rise time	t_r	-	36	-		
Turn-off delay time	$t_{d(off)}$	-	63	-		
Fall time	t_f	-	18	-		

Body Diode Characteristic

Parameter	Symbol	Value			Unit	Test Condition
		min.	typ.	max.		
Body Diode Forward Voltage	V_{SD}	-	0.8	1	V	$V_{GS}=0V, I_{SD}=5.5A$
Diode continuous forward current	I_S	-	-	11	A	$TC = 25^{\circ}C$
Diode pluse current	$I_{S\ pluse}$	-	-	33	A	$TC = 25^{\circ}C$
Body Diode Reverse Recovery Time ^[3]	t_{rr}	-	265	-	ns	$I_F=5.5A, dI/dt=100A/\mu s$
Body Diode Reverse Recovery Charge ^[3]	Q_{rr}	-	2.3	-	uC	

[3]. Defined by design. Not subject to production test

Typical Performance Characteristics

Fig 1: Output Characteristics

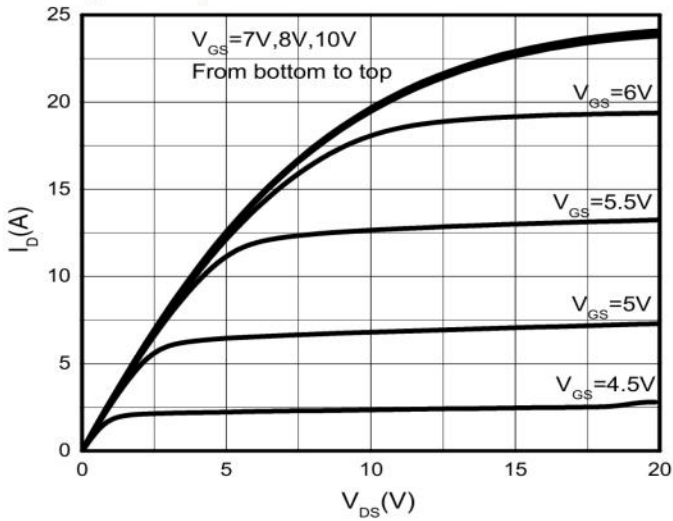


Fig 2: Transfer Characteristics

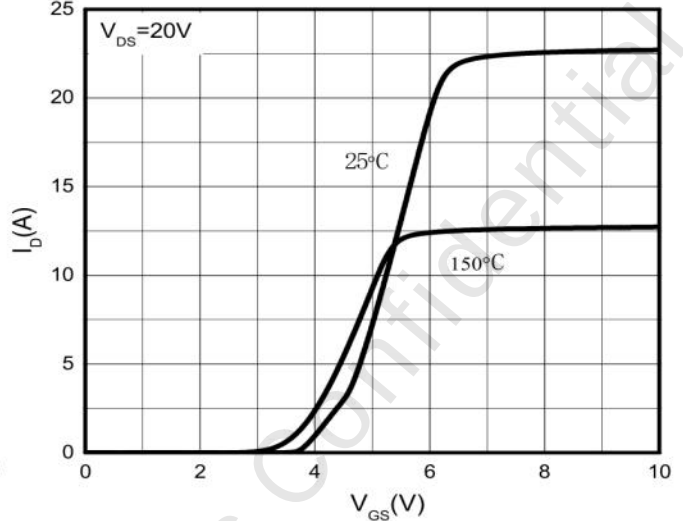


Fig 3: $R_{DS(on)}$ vs Drain Current and Gate Voltage

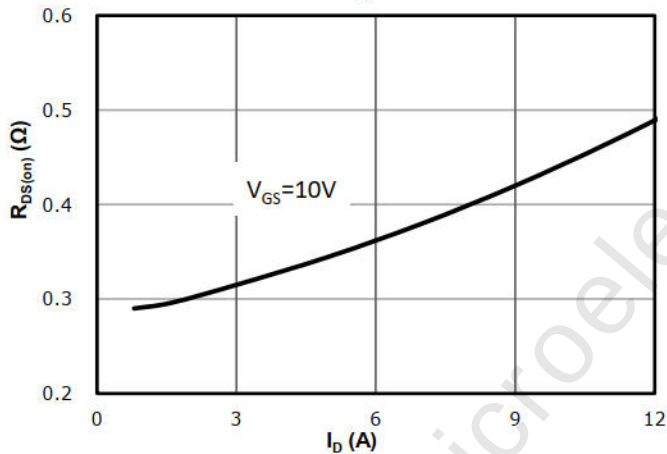


Fig 4: Break Down vs. Junction Temperature

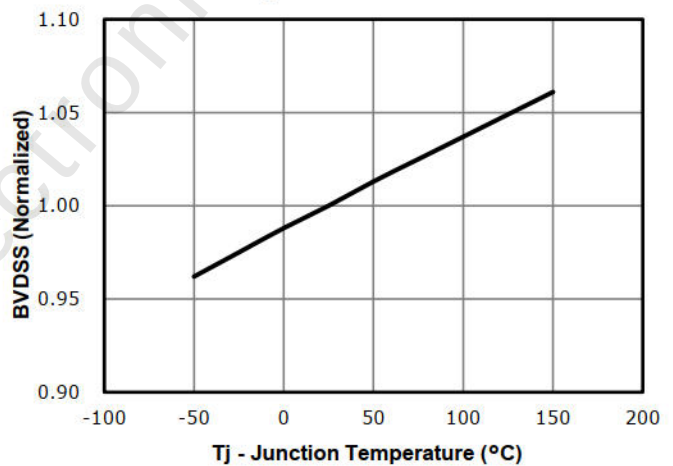


Fig 5: $R_{DS(on)}$ vs. Temperature

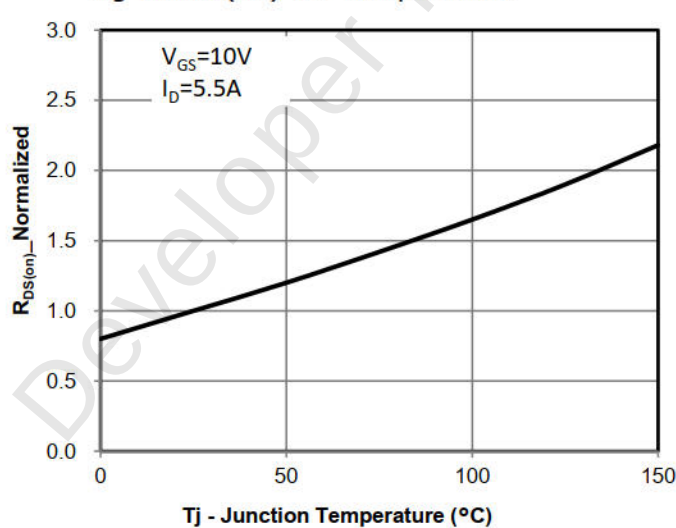


Fig 6: Capacitance Characteristics

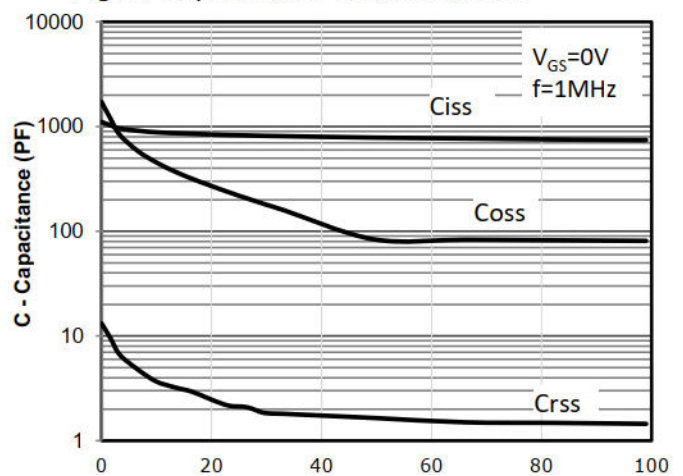


Fig 7: Gate Charge Characteristics

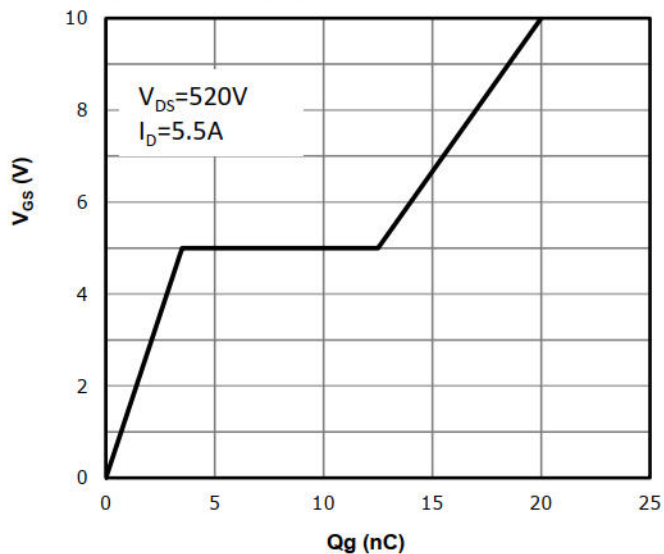


Fig 8: Body-diode Forward Characteristics

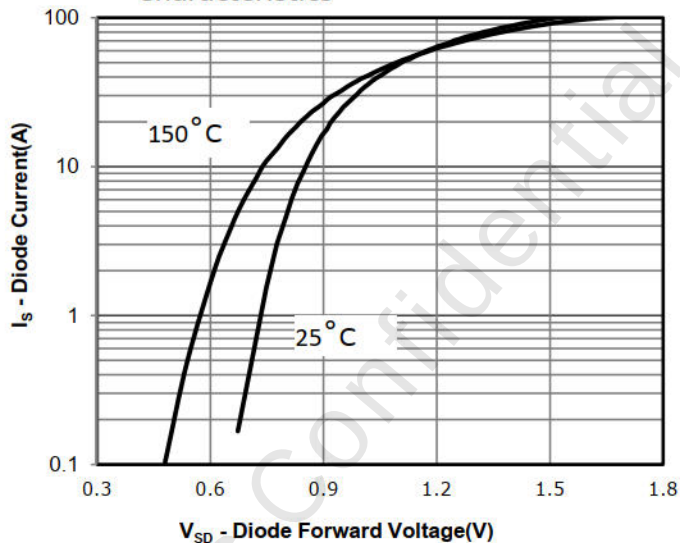


Fig 9: Rds(on) vs Gate Voltage

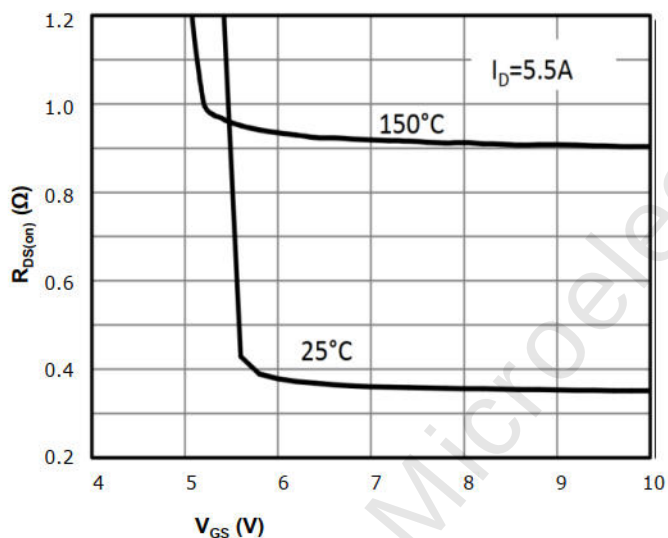


Fig 10: Drain Current Derating

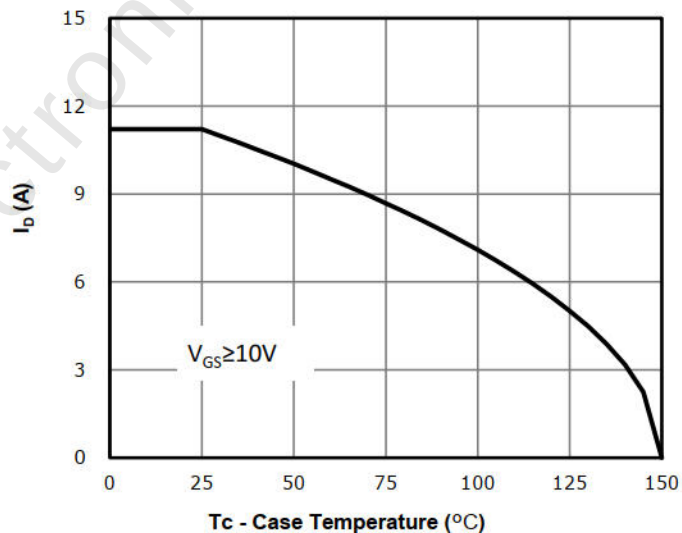


Fig 11: Safe Operating Area

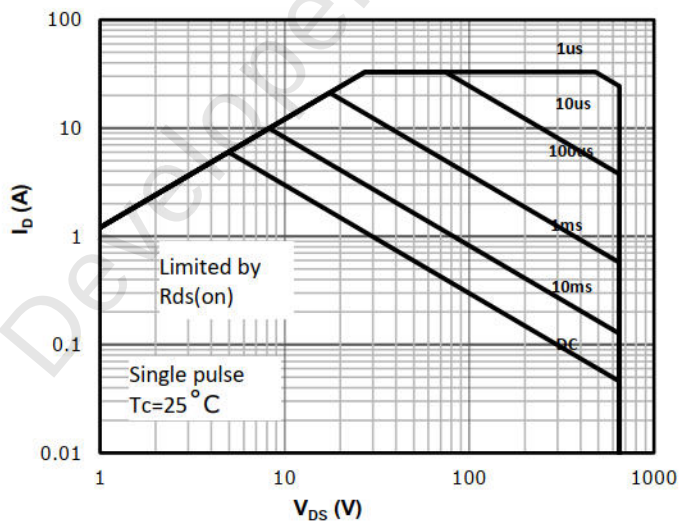
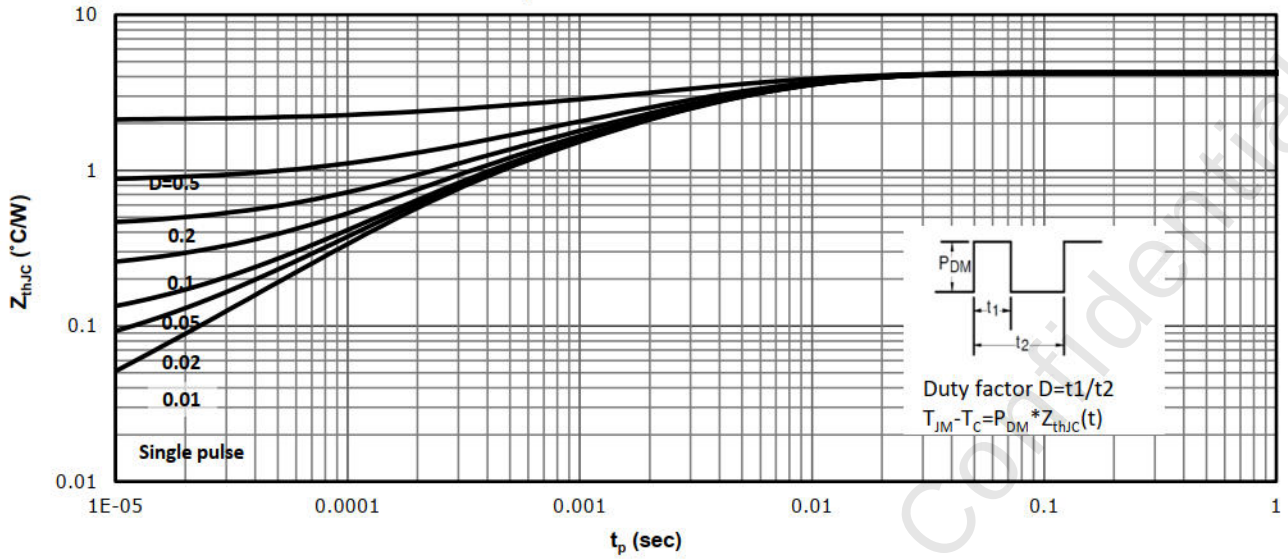
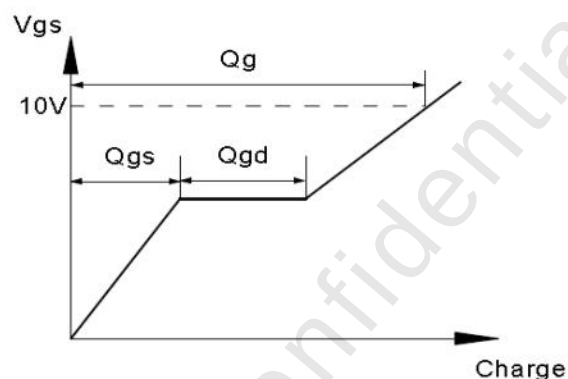
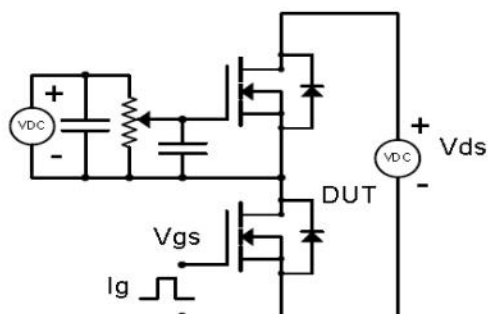


Fig 12: Max. Transient Thermal Impedance

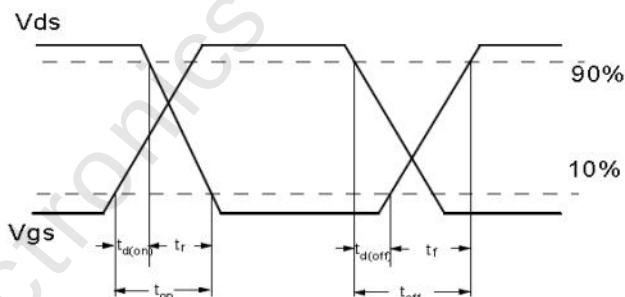
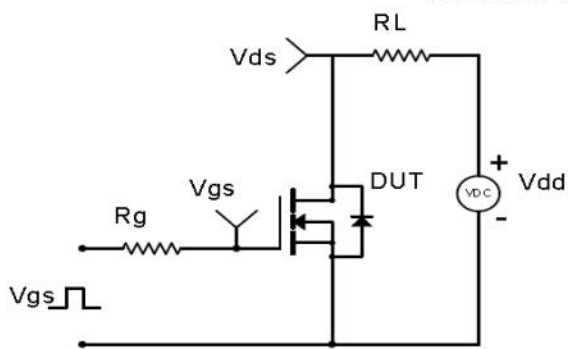


Test Circuit & Waveform

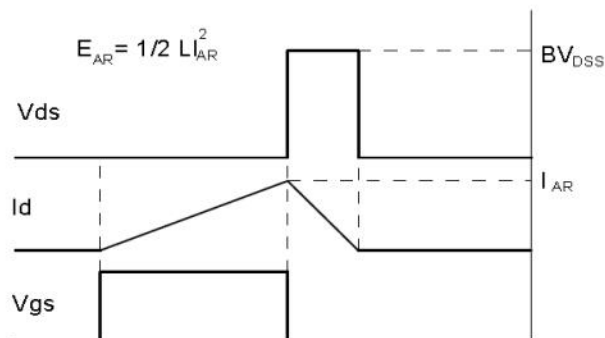
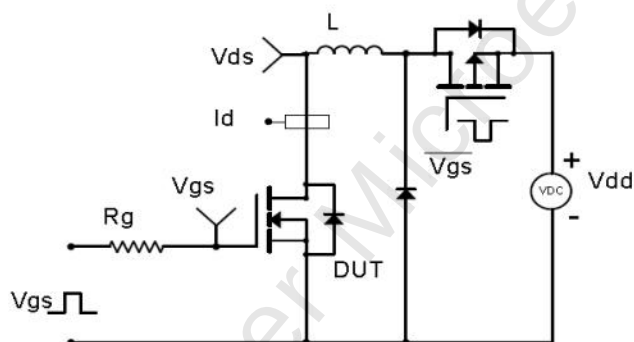
Gate Charge Test Circuit & Waveform



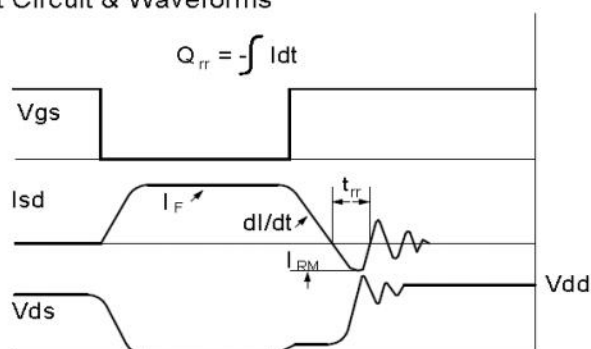
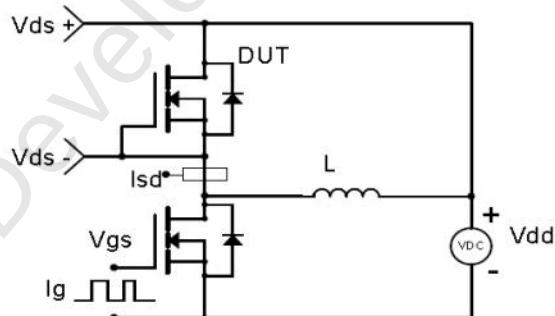
Resistive Switching Test Circuit & Waveforms



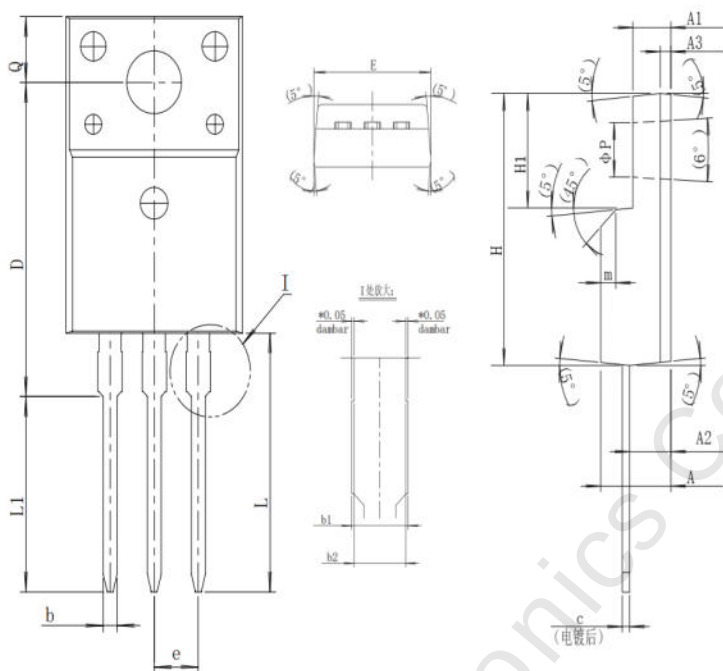
Unclamped Inductive Switching (UIS) Test Circuit & Waveforms



Diode Recovery Test Circuit & Waveforms

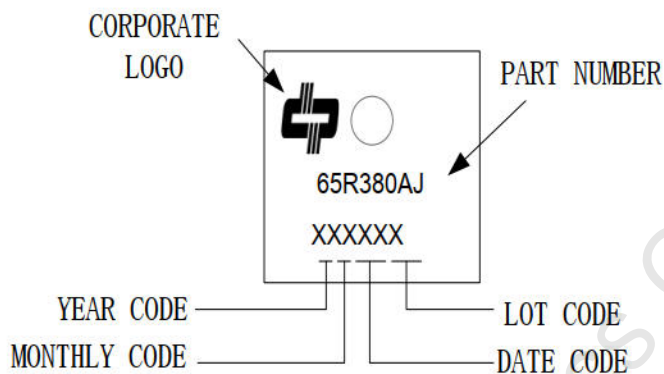


Package Outline: TO-220F



Symbol	Dimensions In Millimeters		
	Min.	NOM	Max.
A	4.60	4.70	4.80
A1	2.44	2.54	2.64
A2	2.65	2.75	2.85
A3	0.7 REF		
b	0.70	0.80	0.90
b1	1.28	1.38	1.47
b2	1.18	1.28	1.39
c	0.45	0.50	0.60
D	15.64	15.75	15.85
E	10.06	10.16	10.26
e	2.54 BSC		
H	15.77	15.87	15.97
H1	6.58	6.68	6.78
L	12.68	12.98	13.28
L1	9.60	9.80	10.00
Q	3.20	3.30	3.40
ΦP	3.08	3.18	3.28
m	0.50	1.00	1.50

Part Marking Information



Revision History

Revision	Major changes
1.0	Release for formal version

重要声明Important Notice

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