

ID	$R_{DS(ON)}$ (Typ)	VDSS
22A	130m Ω	650V

Applications:

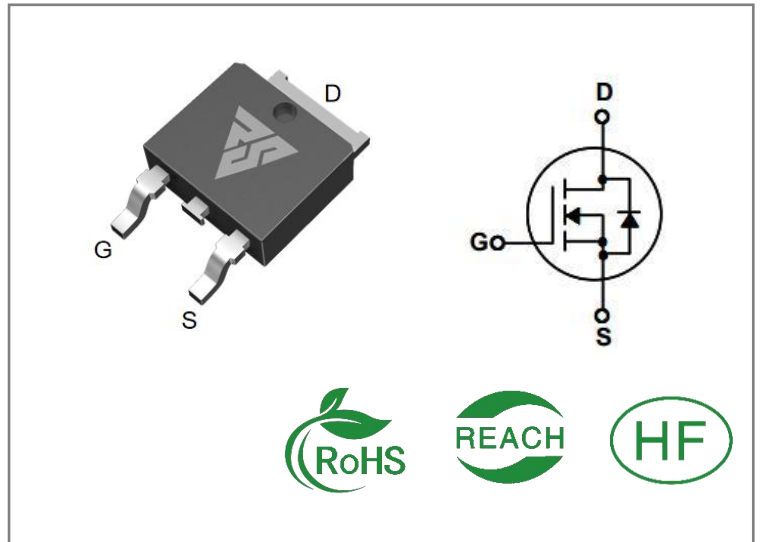
- Switch Mode Power Supply(SMPS)
- Uninterruptible Power Supply (UPS)
- Power Factor Correction (PFC)
- AC-DC Switching Power Supply

Features:

- Fast switching speed
- 100% avalanche tested
- Improved dv/dt capability
- Fast Recovery Time

Ordering Information

Part Number	Package	Marking	Packing	Qty.
RSF65T160D	T0-252	RSF65T160D	Tape&reel	2500 PCS


Absolute Maximum Ratings $T_c = 25^\circ\text{C}$ unless otherwise specified

Symbol	Parameter	RSF65T160D	Units
VDSS	Drain-to-Source Voltage	650	V
ID	Continuous Drain Current $T_C=25^\circ\text{C}$	22	A
ID	Continuous Drain Current $T_C=100^\circ\text{C}$	14	
IDM	Pulsed Drain Current (Note*1)	66	
PD	Power Dissipation	119	W
VGS	Gate- to- Source Voltage	± 30	V
EAS	Single Pulse Avalanche Energy $V_G=10\text{V}, V_{DD}=85\text{V}, R_G=25\Omega, T_C=25^\circ\text{C}$	405	mJ
dv/dt	Peak Diode Recovery dv/dt	15	V/ns
TL TPKG	Maximum Temperature for Soldering	300	$^\circ\text{C}$
	Leads at 0.063in(1.6mm)from Case for 10 seconds Package Body for 10 seconds	260	
TJ and TSTG	Operating Junction and Storage Temperature Range	-55 to 150	

* Drain Current Limited by Maximum Junction Temperature

Caution: Stresses greater than those listed in the "Absolute Maximum Ratings" Table may cause permanent damage to the device.

Thermal Resistance

Symbol	Parameter	RSF65T160D	Units	Test Conditions
R θ JC	Junction-to-Case	1.05	°C / W	Drain lead soldered to water cooled heatsink, PD adjusted for a peak junction temperature of + 1 5 0 °C
R θ JA	Junction-to-Ambient	50		1 cubic foot chamber, free air.

OFF Characteristics TJ= 25°C unless otherwise specified

Symbol	Parameter	Min.	Typ.	Max.	Units	Test Conditions
BVDSS	Drain- to- source Breakdown Voltage	650	--	--	V	VGS=0V ID=250μA
IDSS	Drain- to- Source Leakage Current	--	--	10	μA	VDS=650V VGS=0V
IGSS	Gate- to- Source Forward Leakage	--	--	100	nA	VGS=30V VDS=0V
	Gate- to- Source Reverse Leakage	--	--	-100		VGS=-30V VDS=0V

ON Characteristics TJ=25°C unless otherwise specified

Symbol	Parameter	Min.	Typ.	Max.	Units	Test Conditions
RDS(on)	Static Drain- to- Source On-Resistance(Note*2)	--	130	160	mΩ	VGS=10V ID=10A
VGS(TH)	Gate Threshold Voltage	2.5	3.5	4.5	V	VGS=VDS ID=250μA

Resistive Switching Characteristics Essentially independent of operating temperature

Symbol	Parameter	Min.	Typ.	Max.	Units	Test Conditions
td(ON)	Turn- on Delay Time	--	24	--	nS	VDS=325V ID=22A RG=10Ω
trise	Rise Time	--	52	--		
td(OFF)	Turn- OFF Delay Time	--	42	--		
tfall	Fall Time	--	41	--		

Dynamic Characteristics Essentially independent of operating temperature

Symbol	Parameter	Min.	Typ.	Max.	Units	Test Conditions
Ciss	Input Capacitance	--	1656	--	pF	VGS=0V VDS=200V f=1.0MHz
Coss	Output Capacitance	--	52	--		
Crss	Reverse Transfer Capacitance	--	2.8	--		
Qg	Total Gate Charge	--	33.8	--	nC	VDS=520V ID=22A VGS=10V
Qgs	Gate- to- Source Charge	--	10.2	--		
Qgd	Gate-to-Drain(" Miller") Charge	--	14	--		

Source- Drain Diode Characteristics

Symbol	Parameter	Min.	Typ.	Max.	Units	Test Conditions
IS	Continuous Source Current	--	--	22	A	Integral pn- diode in MOSFET
ISM	Maximum Pulsed Current	--	--	66	A	
VSD	Diode Forward Voltage	--	--	1.4	V	IS=22A VGS=0V
trr	Reverse Recovery Time	--	162	--	nS	VG=0V IS=22A di/dt=100A/μs
Qrr	Reverse Recovery Charge	--	981	--	nC	

Notes:

- * 1. Repetitive rating, pulse width limited by maximum junction temperature.
- * 2. Pulse Test: Pulse width $\leq 300\mu s$, Duty Cycle $\leq 2\%$
- * 3. ISD $\leq 4A$, di/dt $\leq 100A/\mu s$, VDD ≤ 400 , Starting TJ = 25°C

Typical Feature Curve

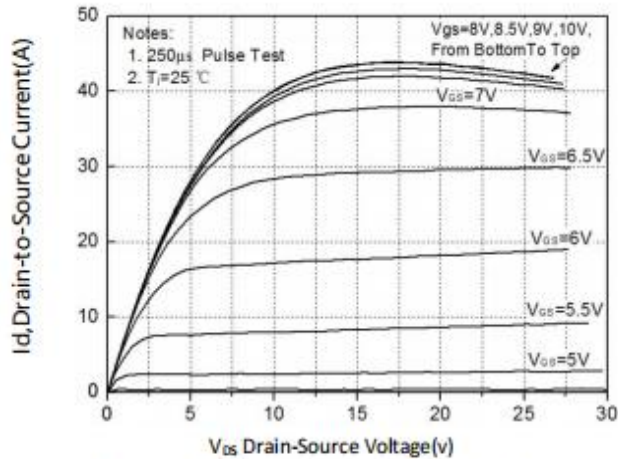


Figure1. Typical Output Characteristics

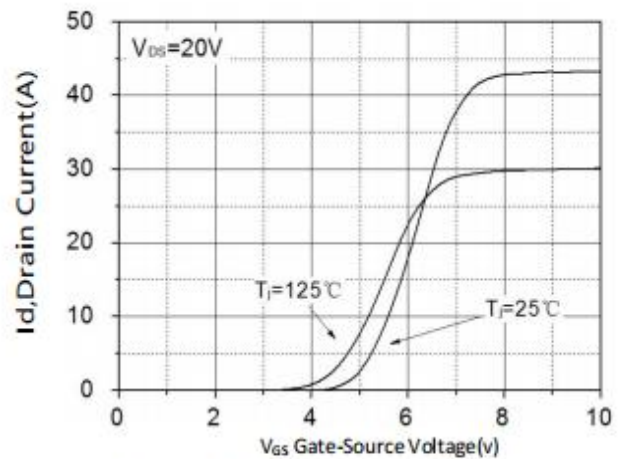


Figure2. Typical Transfer Characteristics

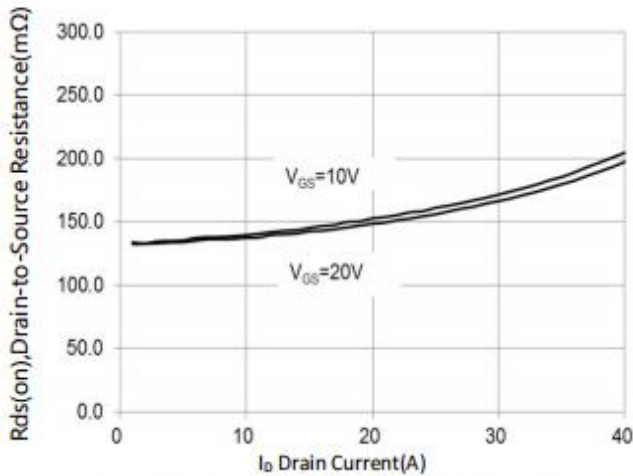


Figure3. On-Resistance versus Drain Current

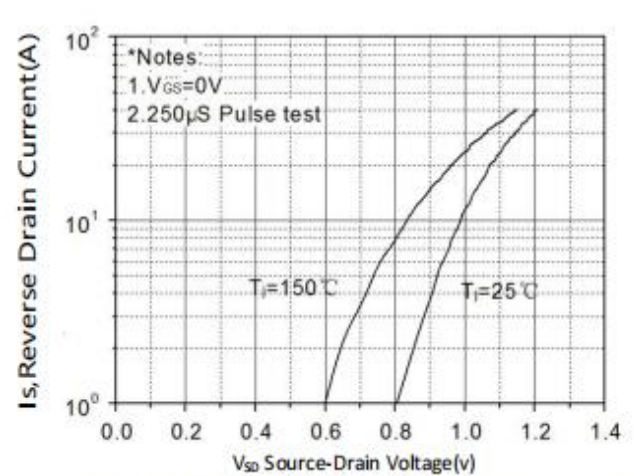


Figure4. Diode forward voltage versus Current

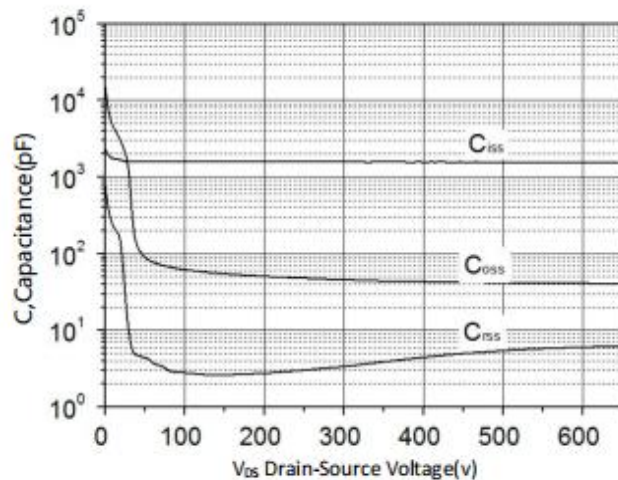


Figure5. Typical Capacitance versus VDS

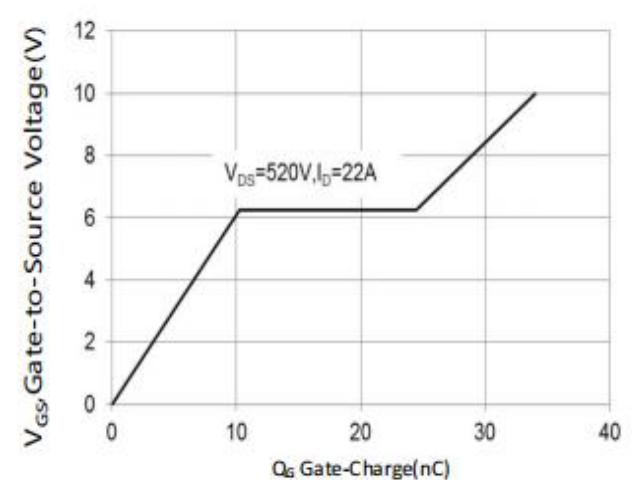


Figure6. Typical Gate Charge versus VGS

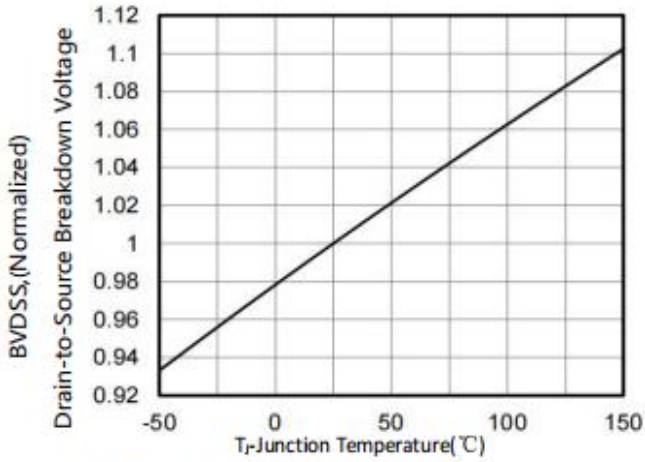


Figure7. BV_{DS} Variation with Temperature

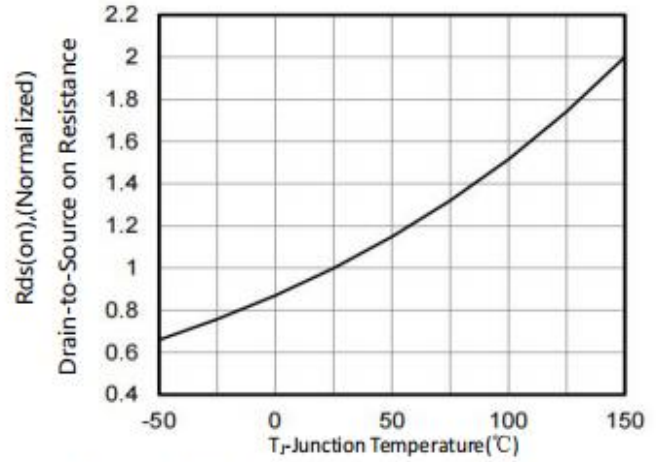
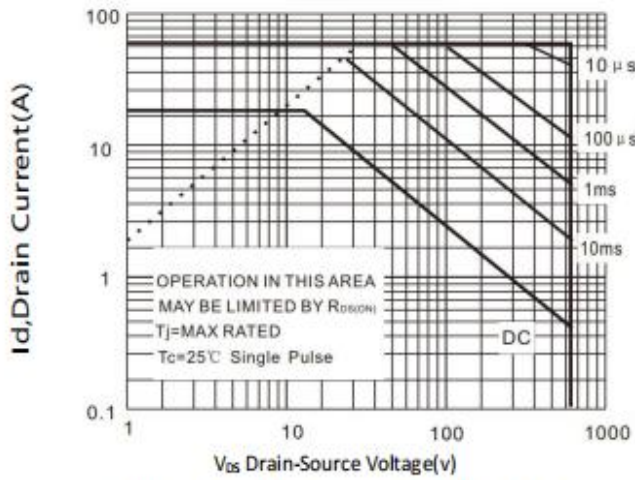
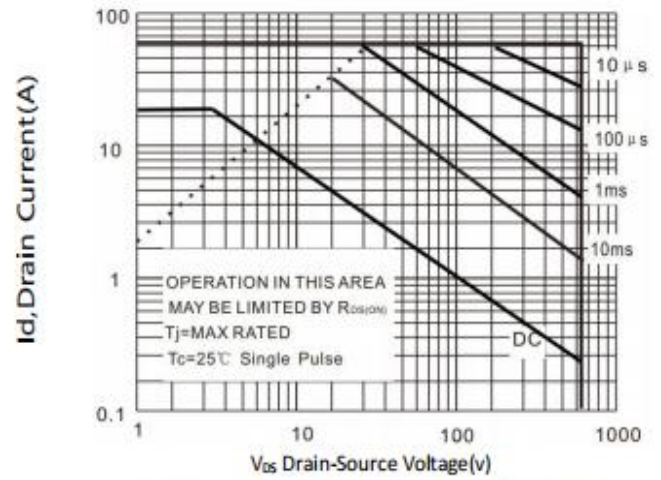


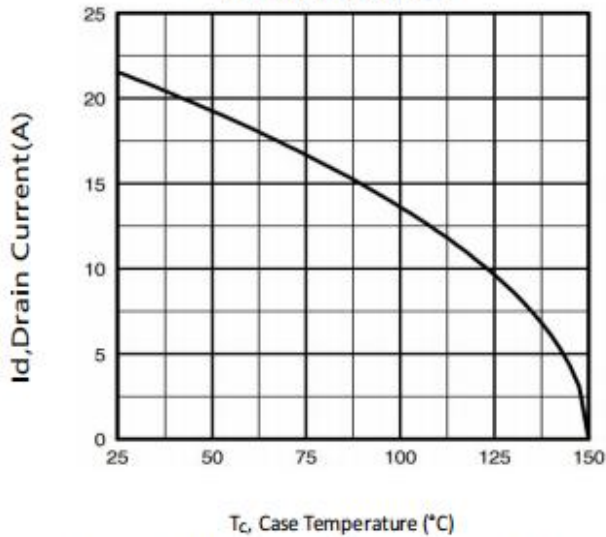
Figure8. On-Resistance Variation with Temperature



**Figure9. Maximum Safe Operating Area
TO-247/220/252/263**

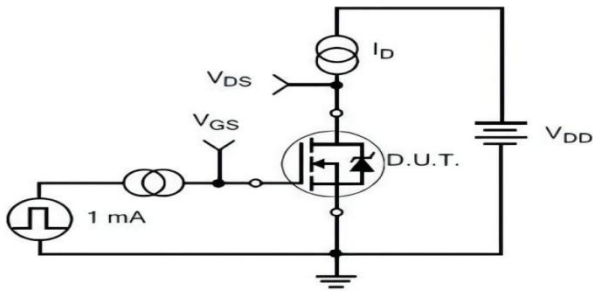


**Figure9. Maximum Safe Operating Area
TO-220F**

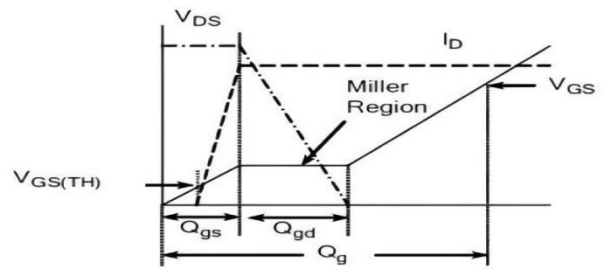


**Figure10. Maximum Continuous Drain Current
versus Case Temperature**

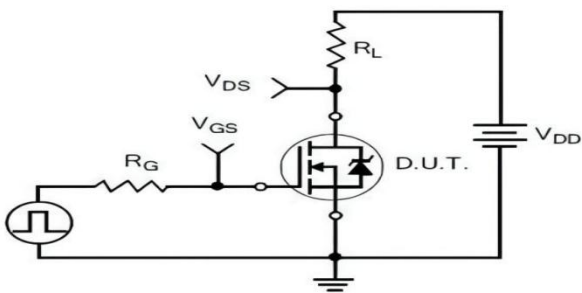
Test Circuits and Waveforms



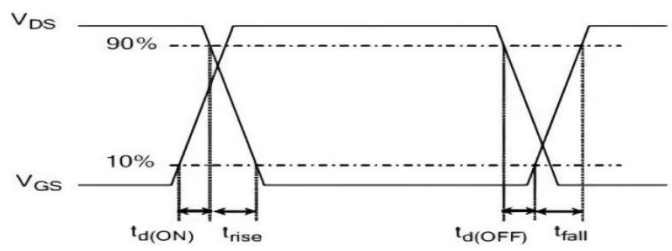
Gate Charge Test Circuit



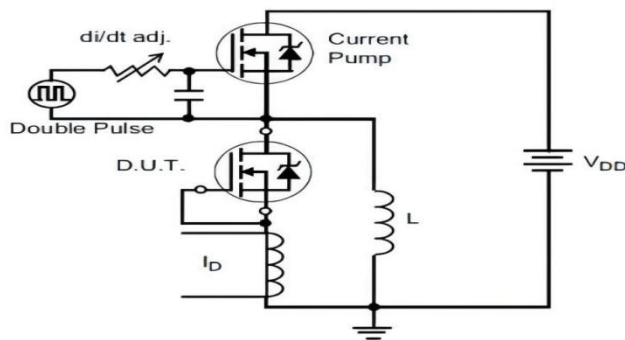
Gate Charge Waveform



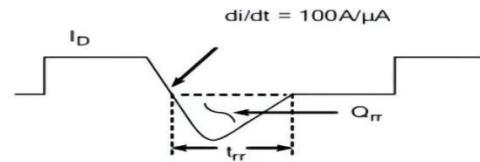
Resistive Switching Test Circuit



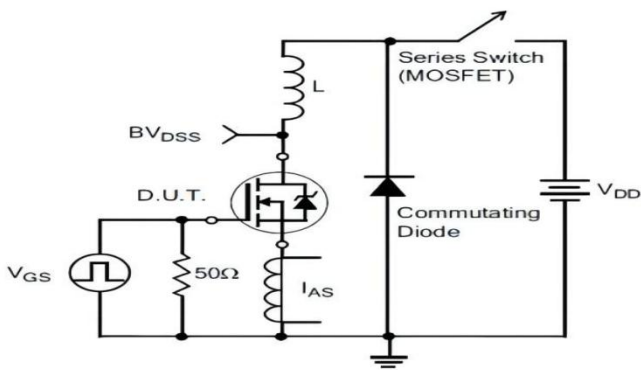
Resistive Switching Waveforms



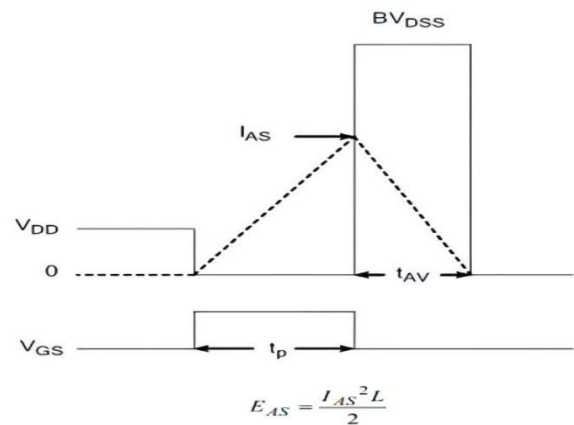
Diode Reverse Recovery Test Circuit



Diode Reverse Recovery Waveform

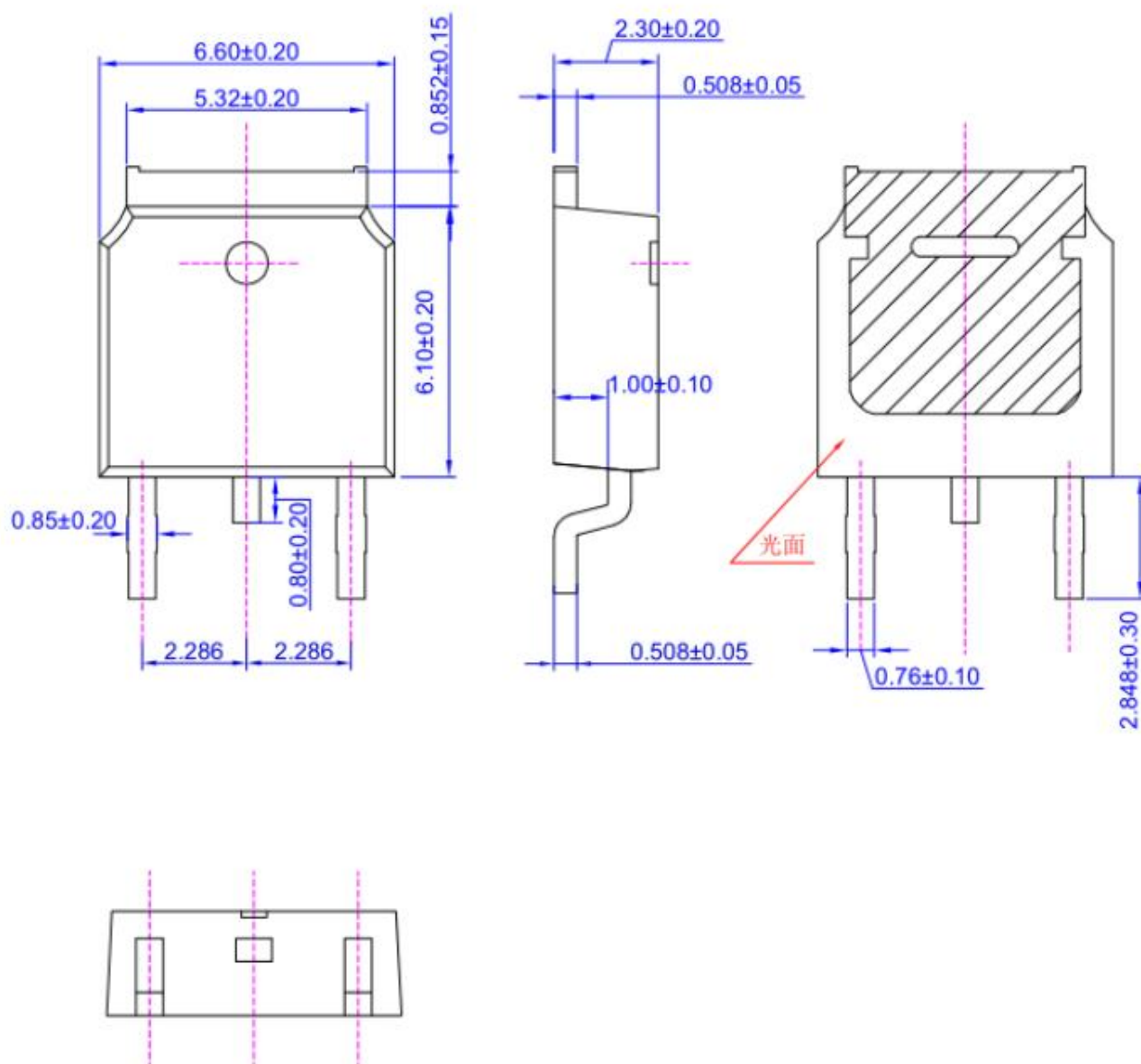


Unclamped Inductive Switching Test Circuit



Unclamped Inductive Switching Waveforms

Package outline drawing (TO-252 Unit: mm)



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