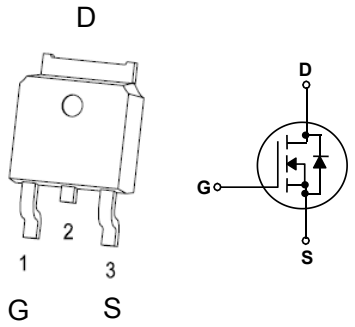
40V/130A N-Channel Advanced Power MOSFET

BVDSS	40	V
ID	130	A
RDSON@VGS=10V	2.5	mΩ
RDSON@VGS=4.5V	3.1	mΩ

TO-252



General Description

This Power MOSFET is produced using Msemitek's advanced TRENCH technology.
This advanced technology has been especially tailored to minimize conduction loss, provide superior switching performance, and withstand high energy pulse in the avalanche and commutation mode.

Features

- Very Low On-resistance $R_{DS(ON)}$
- Low Crss
- Fast switching
- 100% avalanche tested
- Improved dv/dt capability

Application

- PWM Application
- Load Switch
- Power Management

Order Information

Product	Package	Marking	Reel
M04N130L	TO-252	SLD130N04T	2500PCS

Absolute Maximum Ratings

T_C = 25°C unless otherwise noted

Symbol	Parameter	SLD130N04T	Units
V_{DSS}	Drain-Source Voltage	40	V
I_D	Drain Current - Continuous (T_C = 25℃)	130	A
	- Continuous (T_C = 100℃)	84	A
I_{DM}	Drain Current - Pulsed (Note 1)	400	A
V_{GSS}	Gate-Source Voltage	±20	V
E_{AS}	Single Pulsed Avalanche Energy (Note 2)	250	mJ
P_D	Power Dissipation (T_C = 25℃)	130	W
$R_{\theta JC}$	Thermal Resistance, Junction to Case	0.96	℃/W
T_J, T_{STG}	Operating and Storage Temperature Range	-55 to +150	℃
T_L	Maximum lead temperature for soldering purposes, 1/8" from case for 5 seconds	300	℃

* Drain current limited by maximum junction temperature.

40V/130A N-Channel Advanced Power MOSFET

Electrical Characteristics

T_C = 25°C unless otherwise noted

Symbol	Parameter	Test Conditions	Min	Typ	Max	Units
Off Characteristics						
BV_{DSS}	Drain-Source Breakdown Voltage	V_{GS} = 0 V, I_D = 250 uA	40	--	--	V
I_{DSS}	Zero Gate Voltage Drain Current	V_{DS} =40 V, V_{GS} = 0 V	--	--	1	uA
I_{GSSF}	Gate-Body Leakage Current, Forward	V_{GS} = 20V, V_{DS} = 0 V	--	--	100	nA
I_{GSSR}	Gate-Body Leakage Current, Reverse	V_{GS} = -20 V, V_{DS} = 0 V	--	--	-100	nA
On Characteristics						
$V_{GS(th)}$	Gate Threshold Voltage	V_{DS} = V_{GS}, I_D = 250 uA	1.0	1.5	2.3	V
$R_{DS(on)}$	Static Drain-Source On-Resistance	V_{GS} =10 V, I_D = 20A	--	2.5	3.0	mΩ
		V_{GS} =4.5 V, I_D = 15A	--	3.1	4.2	
Dynamic Characteristics						
C_{iss}	Input Capacitance	V_{DS} = 15 V, V_{GS} = 0 V, f = 1.0 MHz	--	6263	-	pF
C_{oss}	Output Capacitance		--	583	-	pF
C_{rss}	Reverse Transfer Capacitance		--	573	-	pF
Switching Characteristics						
$t_{d(on)}$	Turn-On Delay Time	V_{GS}=10V, V_{DS}=20V, R_L = 3Ω ,I_D=10A Tj=25℃ (Note 3)	--	15	--	ns
t_r	Turn-On Rise Time		--	19	--	ns
$t_{d(off)}$	Turn-Off Delay Time		--	48	--	ns
t_f	Turn-Off Fall Time		--	14	--	ns
Q_g	Total Gate Charge	V_{DS} =15V, I_D =20A, V_{GS} = 10V (Note 3)	--	133	--	nC
Q_{gs}	Gate-Source Charge		--	29	--	nC
Q_{gd}	Gate-Drain Charge		--	16	--	nC
R_G	Gate Resistance	f = 1MHz	--	1.3	--	Ω
Drain-Source Diode Characteristics and Maximum Ratings						
I_S	Maximum Continuous Drain-Source Diode Forward Current		--	--	130	A
I_{SM}	Maximum Pulsed Drain-Source Diode Forward Current		--	--	400	A
V_{SD}	Drain to Source Diode Forward Voltage,V_{GS} = 0V, I_{SD} =20A,T_J = 25℃		--	--	1.2	V

Notes:

1. Repetitive Rating: Pulse Width Limited by Maximum Junction Temperature
2. EAS condition: T_J =25℃, V_{DD} =20V, V_G =10V, R_G =25Ω, L=0.5mH.
3. Pulse Test: Pulse Width≤300μs, Duty Cycle≤0.5%

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N- Channel Typical Characteristics

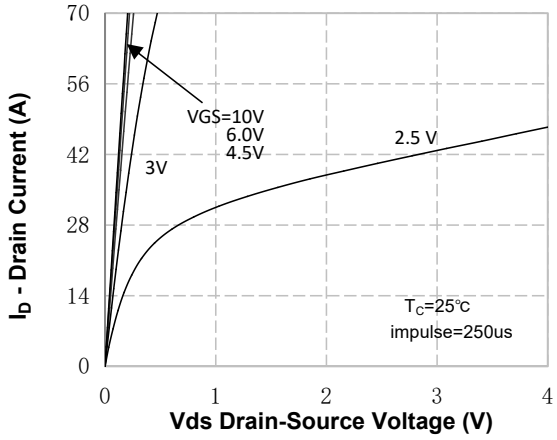


Figure 1. On-Region Characteristics

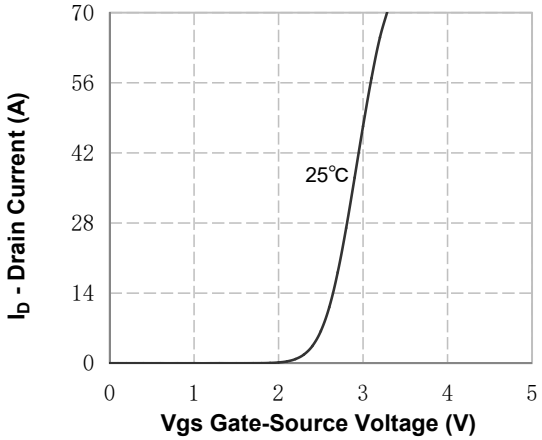


Figure 2. Transfer Characteristics

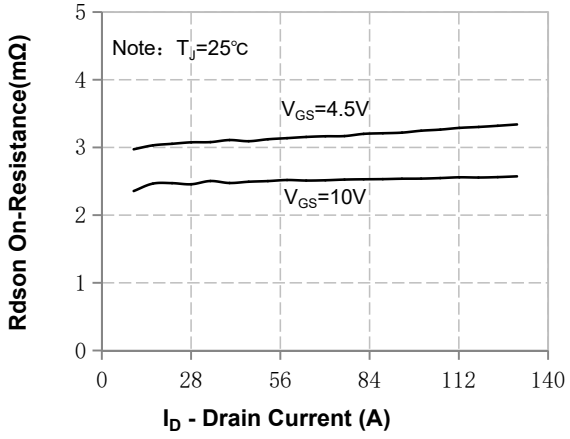


Figure 3. On-Resistance Variation vs Drain Current and Gate Voltage

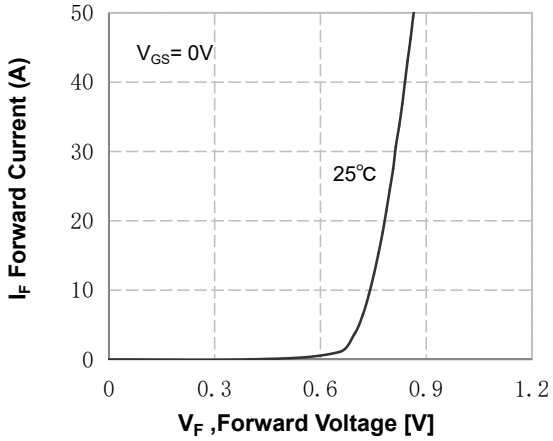


Figure 4. Body Diode Forward Voltage Variation with Source Current

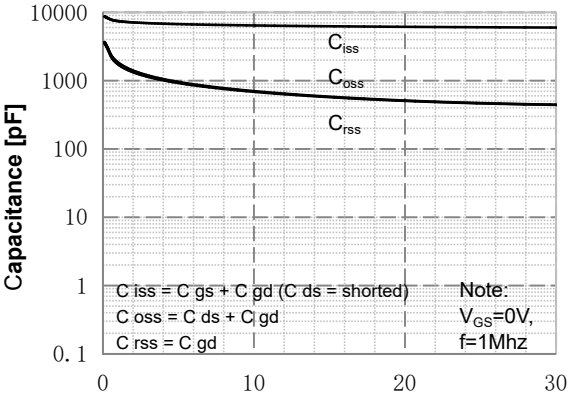


Figure 5. Capacitance Characteristics

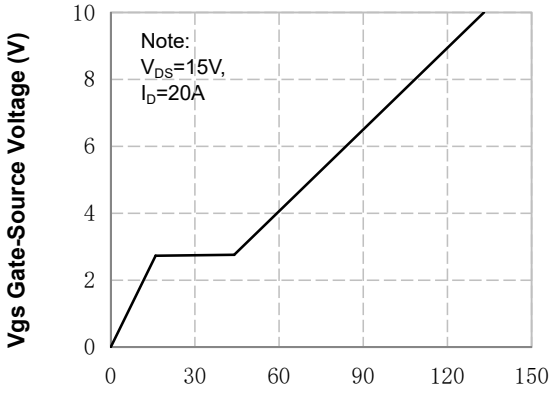


Figure 6. Gate Charge Characteristics

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N- Channel Typical Characteristics (Continued)

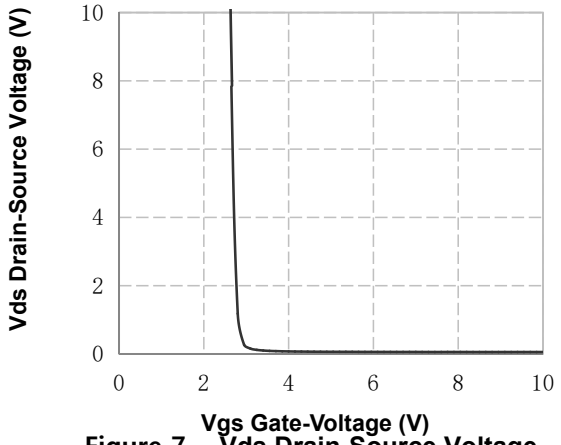


Figure 7. Vds Drain-Source Voltage vs Gate Voltage

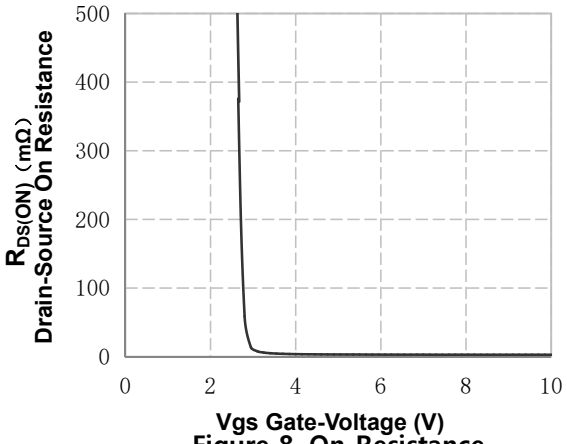


Figure 8. On-Resistance vs Gate Voltage

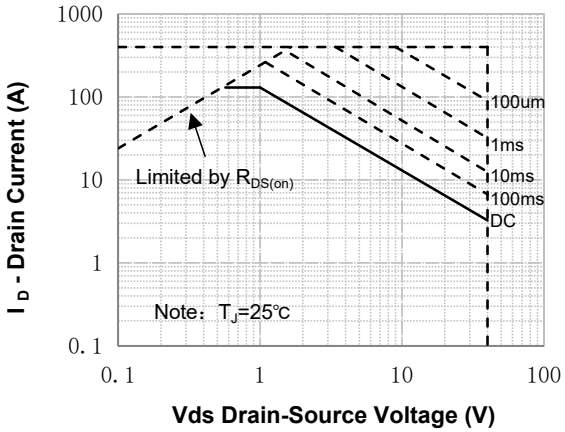


Figure 9. Maximum Safe Operating Area

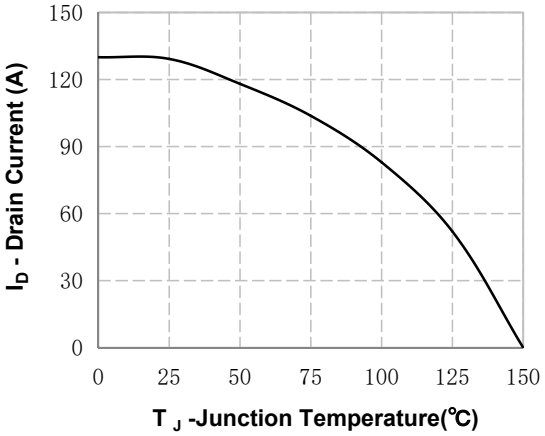


Figure 10. Maximum Continuous Drain Current vs Temperature

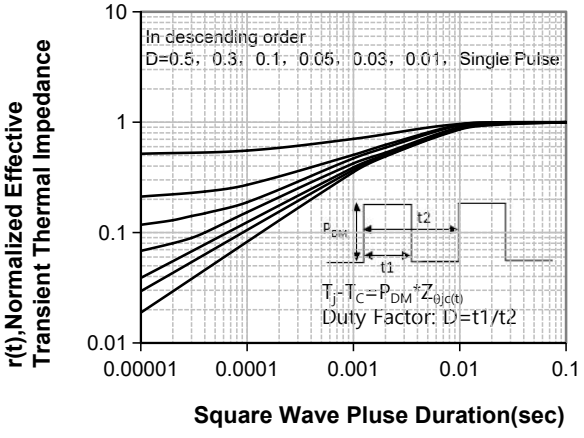
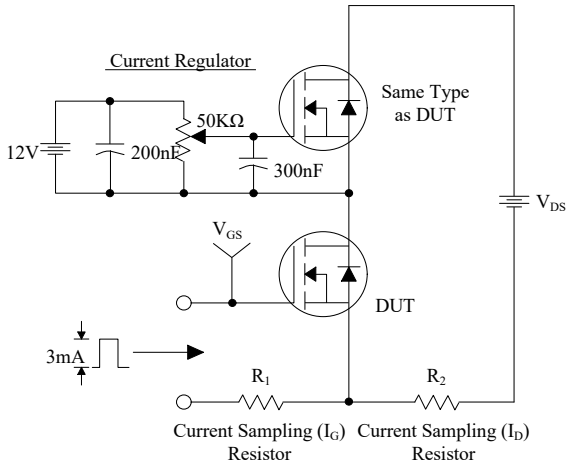
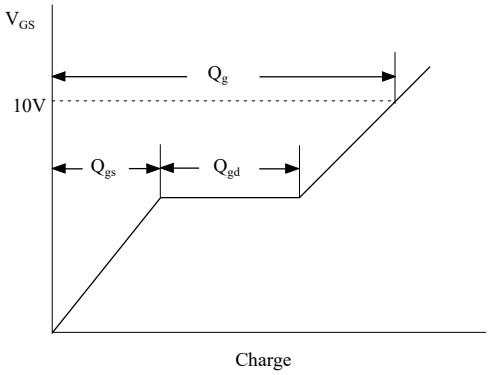


Figure 11. Transient Thermal Response Curve

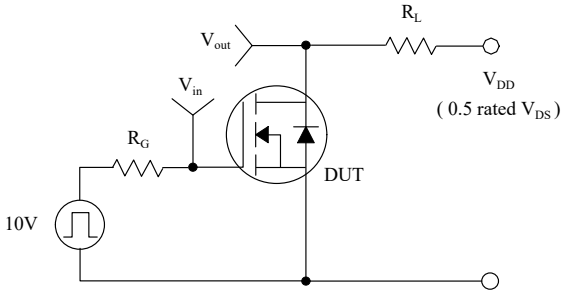
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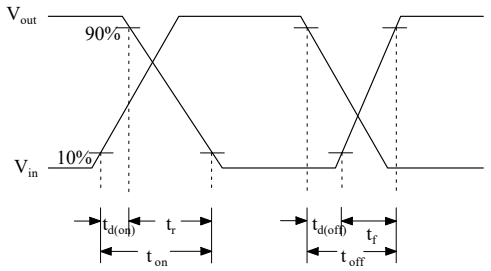
Gate Charge Test Circuit & Waveform



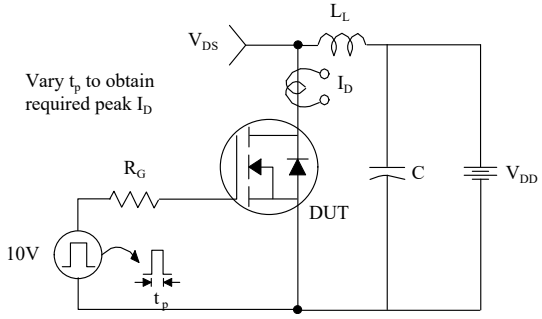


Resistive Switching Test Circuit & Waveforms

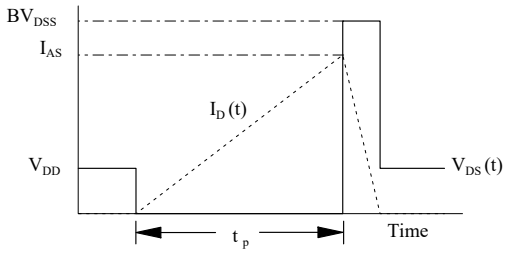




Unclamped Inductive Switching Test Circuit & Waveforms

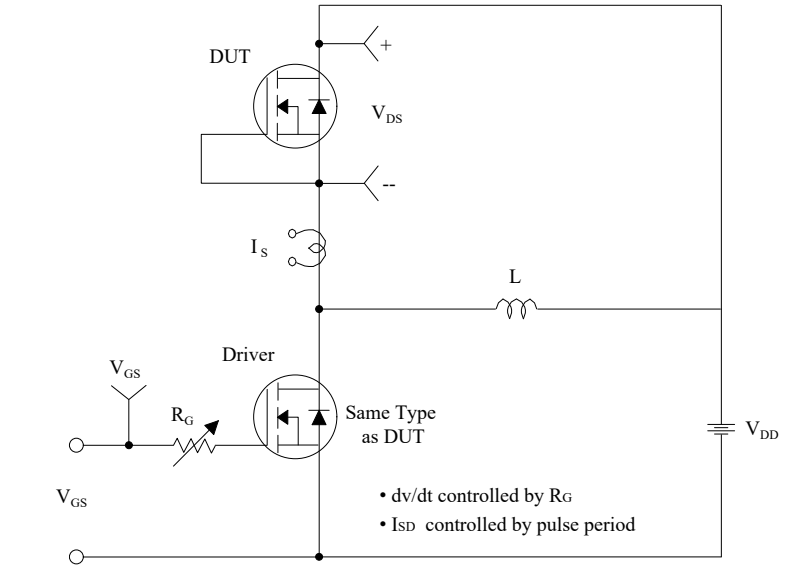


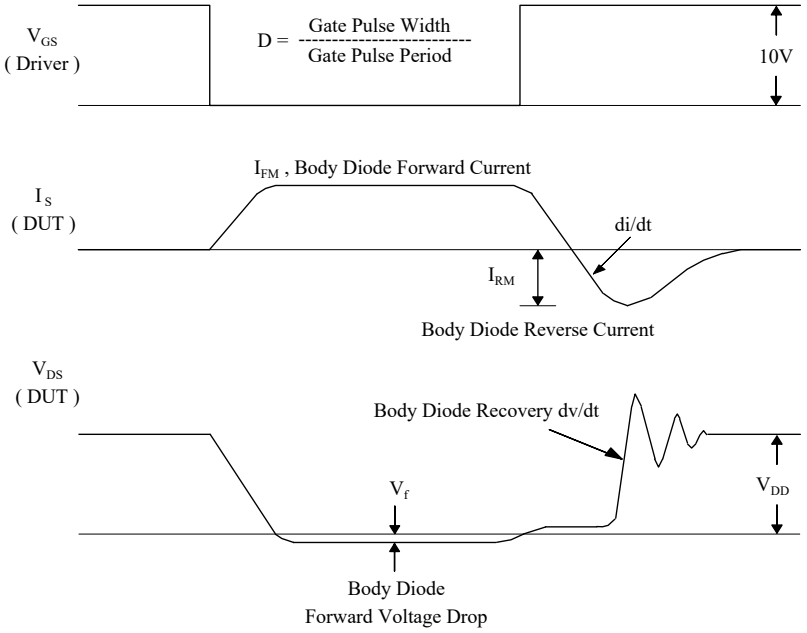
$$E_{AS} = \frac{1}{2} L_L I_{AS}^2$$



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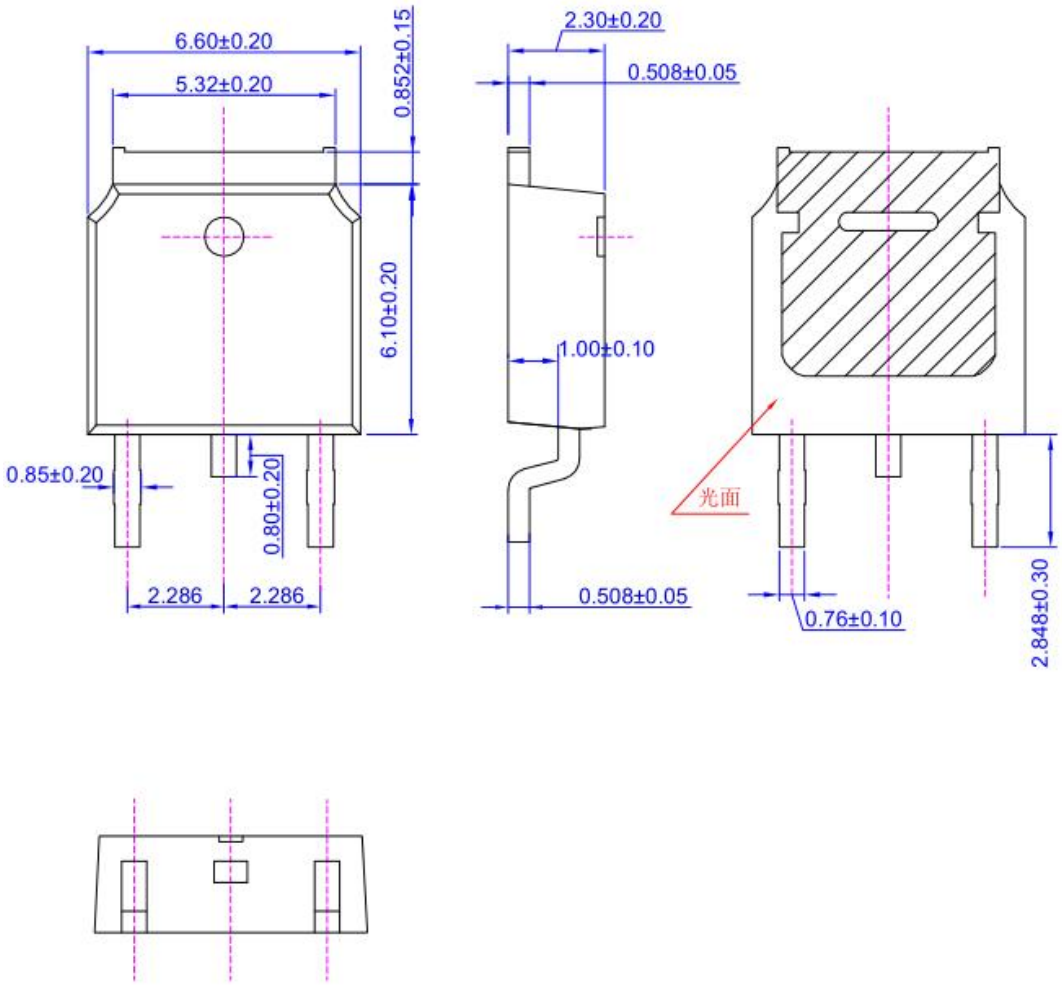
Peak Diode Recovery dv/dt Test Circuit & Waveforms





40V/130A N-Channel Advanced Power MOSFET

TO-252 OUTLINE



NOTE：
1The plastic package is not marked as smooth surfaceRa=0.1;Subglossy surfaceRa=0.8
2.Undeclared tolerance±0.25,Unmarked filletRmax=0.25