

FMOSL2606-H

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FMOSL2606-H

20V Complementary N/P-Channel Enhancement Mode MOSFET

Features

- Fast switching.
- Green Device Available.
- Surface mount package.
- This is a Pb-free device.
- Lead-free parts meet RoHS requirements.
- Halogen-free (IEC61249-2-21).

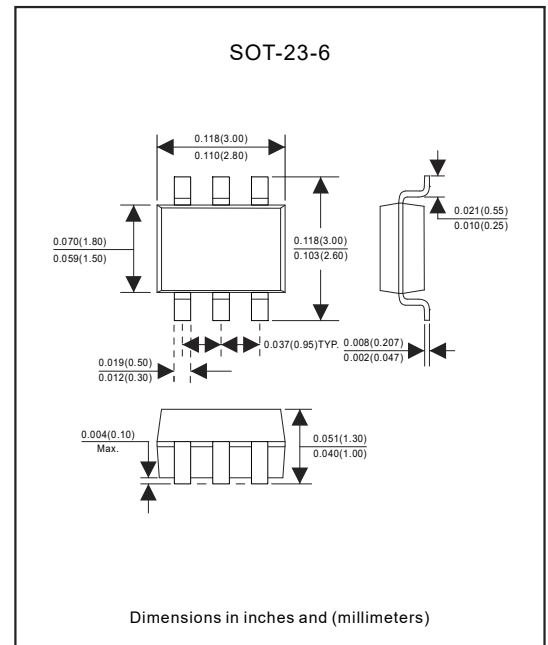
Application

- Notebook.
- Lead Switch.
- Networking.
- Hand-held instruments.

Mechanical data

- Epoxy : UL94-V0 rated flame retardant.
- Case : Molded plastic, SOT-23-6.
- Terminals : Solder plated, solder able per MIL-STD750, Method 2026.
- Polarity : See Diagram.
- Mounting Position : Any.
- Weight : Approximated 12mg.

Package outline



Maximum Ratings (At $T_A=25^\circ\text{C}$ Unless otherwise noted)

Parameter	Symbol	Rating		Unit
		N-Channel	P-Channel	
Drain-source voltage	V _{DS}	20	-20	V
Gate-source-voltage	V _{GS}	±12	±12	V
Drain current - continuous (Note 1)	I _D	4.5	-3.5	A
Drain current - pulsed (Note 2)	I _{DM}	18	-14	A
Maximum drain to source diode forward current (Note 1)	I _S	2.5	-1.9	A
Power dissipation T _A =25°C T _A =75°C	P _D	1.25		W
		0.75		
Junction temperature	T _j	+150		°C
Storage temperature range	T _{STG}	-55 to +150		°C
Thermal resistance junction to ambient (Note 1)	R _{θJA}	100		°C/W

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N-Channel Electrical Characteristics (At $T_A = 25^\circ\text{C}$ unless otherwise noted)

Parameter	Conditions	Symbol	Min	Typ	Max	Unit
Off Characteristics						
Drain - Source Breakdown Voltage	$V_{GS}=0, I_D=250\mu A$	BV_{DSS}	20			V
Drain - Source Leakage Current	$V_{DS}=20V, V_{GS}=0V$	I_{DSS}			1	μA
Gate - Source Leakage Current	$V_{GS}=\pm 12V, V_{DS}=0V$	I_{GSS}			± 100	nA
On Characteristics (Note 2)						
Gate Threshold Voltage	$V_{GS}=V_{DS}, I_D=250\mu A$	$V_{GS(th)}$	0.4	0.7	1.3	V
Static Drain - Source On - Resistance	$V_{GS}=4.5V, I_D=4.5A$	$R_{DS(on)}$		20	28	m Ω
	$V_{GS}=2.5V, I_D=3.5A$			25	36	m Ω
Forward Transconductance	$V_{DS}=15V, I_D=4.5A$	g_{FS}		8.3		S
Dynamic Parameters (Note 3)						
Input Capacitance	$V_{DS} = 10V, V_{GS} = 0V, f = 1MHz$	C_{iss}		468		pF
Output Capacitance		C_{oss}		87		
Reverse Transfer Capacitance		C_{rss}		64		
Switching Parameters (Note 3)						
Total Gate Charge	$V_{DS} = 10V, V_{GS} = 10V, I_D = 1A$	Q_g		9.4		nC
Gate - Source Charge		Q_{gs}		3.6		
Gate - Drain Charge		Q_{gd}		2.1		
Turn - On Delay Charge	$V_{DS} = 15V, V_{GS} = 10V, R_G = 6\Omega, R_L = 15\Omega, I_D = 1A$	$t_{d(on)}$		9.8		ns
Rise Time		t_r		3.5		
Turn - Off Delay Time		$t_{d(off)}$		18.8		
Fall Time		t_f		4		
Source - Drain Diode Parameters (Note 2)						
Diode Forward Voltage	$V_{GS}=0V, I_S=1.0A$	V_{SD}		0.8	1.3	V

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P-CH Electrical Characteristics (At $T_A=25^\circ\text{C}$ unless otherwise noted)

Parameter	Conditions	Symbol	Min	Typ	Max	Unit
Off Characteristics						
Drain - Source Breakdown Voltage	$-V_{GS}=0, -I_D=250\mu\text{A}$	$-BV_{DSS}$	20			V
Drain - Source Leakage Current	$-V_{DS}=20\text{V}, V_{GS}=0\text{V}$	$-I_{DSS}$			1	μA
Gate - Source Leakage Current	$V_{GS}=\pm 12\text{V}, V_{DS}=0\text{V}$	$-I_{GSS}$			± 100	nA

On Characteristics (Note 3)

Gate Threshold Voltage	$V_{GS}=V_{DS}, -I_D=250\mu\text{A}$	$-V_{GS(th)}$	0.4	0.7	1.2	V
Static Drain - Source On - Resistance	$-V_{GS}=4.5\text{V}, -I_D=3.5\text{A}$	$R_{DS(on)}$		56	70	m Ω
	$-V_{GS}=2.5\text{V}, -I_D=3.0\text{A}$			73	95	m Ω
Forward Transconductance	$-V_{DS}=15\text{V}, -I_D=1\text{A}$	g_{FS}		9		S

Dynamic Parameters (Note 3)

Input Capacitance	$-V_{DS}=15\text{V}, V_{GS}=0\text{V}, f=1\text{MHz}$	C_{iss}		686		pF
Output Capacitance		C_{oss}		90.8		
Reverse Transfer Capacitance		C_{rss}		80.4		

Switching Parameters

Total Gate Charge	$-V_{DS}=15\text{V}, -V_{GS}=10\text{V}, -I_D=1.0\text{A}$	Q_g		9.7		nC
Gate - Source Charge		Q_{gs}		2.05		
Gate - Drain Charge		Q_{gd}		2.43		
Turn - On Delay Charge	$-V_{DD}=15\text{V}, -V_{GS}=10\text{V}, R_G=6\Omega, R_L=15\Omega, -I_D=1.0\text{A}$	$t_{d(on)}$		4.8		ns
Rise Time		t_r		9.6		
Turn - Off Delay Time		$t_{d(off)}$		52		
Fall Time		t_f		8.4		

Source - Drain Diode Parameters (Note 3)

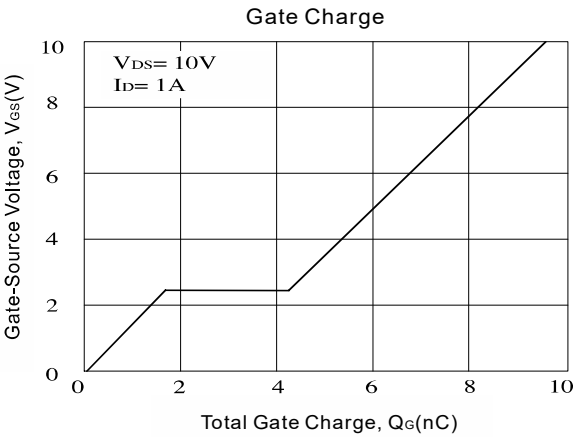
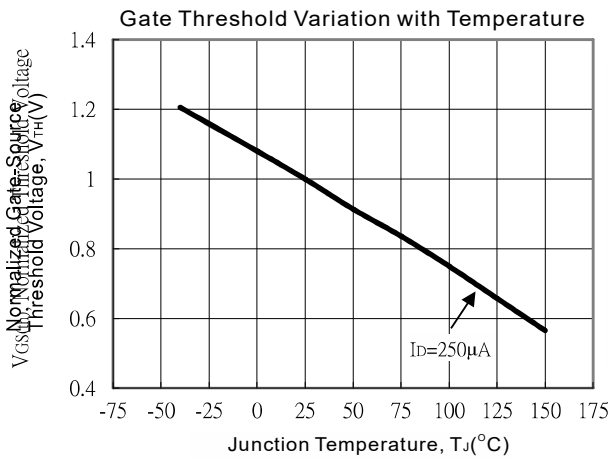
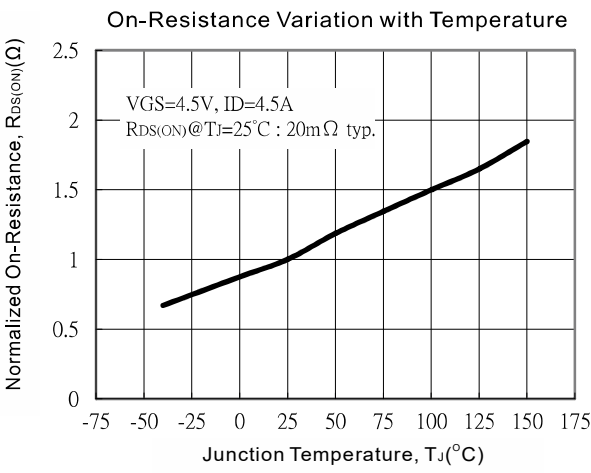
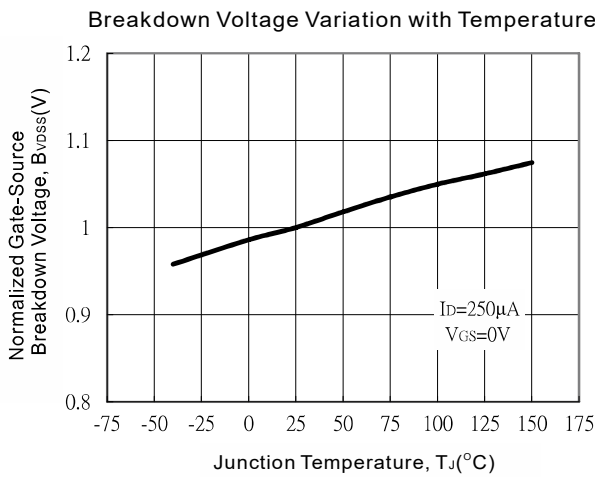
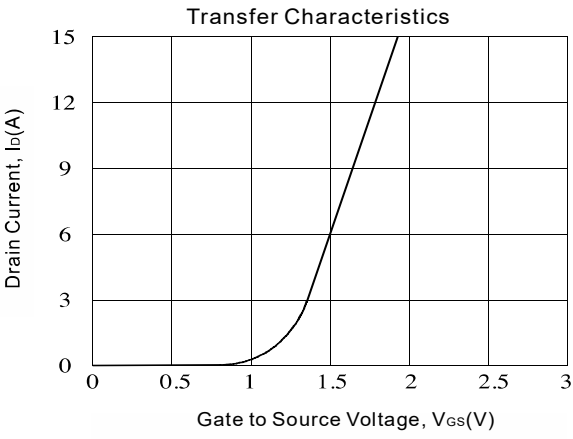
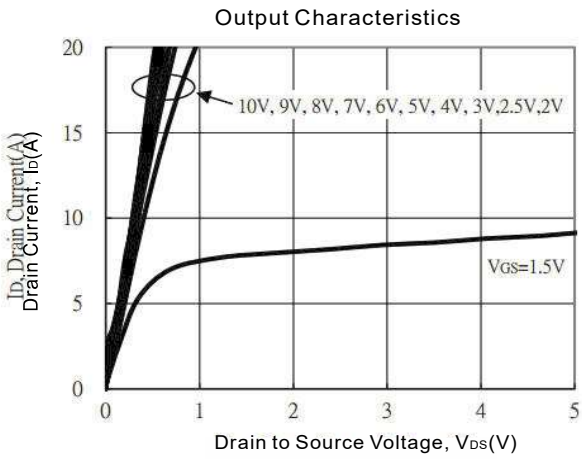
Diode Forward Voltage	$V_{GS}=0\text{V}, -I_S=1.9\text{A}$	$-V_{SD}$		0.8	1.3	V
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Note:

1. Surface mounted on Fr4 board, $t \leq 5\text{sec}$.
2. Pulse width limited by maximum junction temperature.
3. Pulse test : Pulse width $\leq 300\mu\text{s}$, Duty cycle $\leq 2\%$.
4. Guaranteed by design, not subject to production testing.

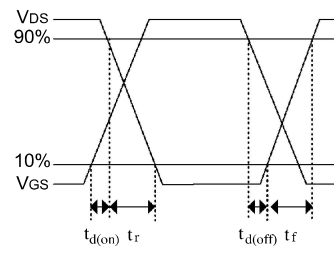
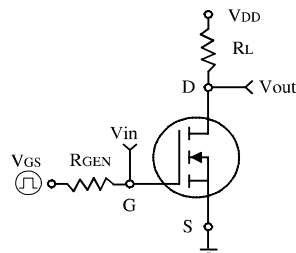
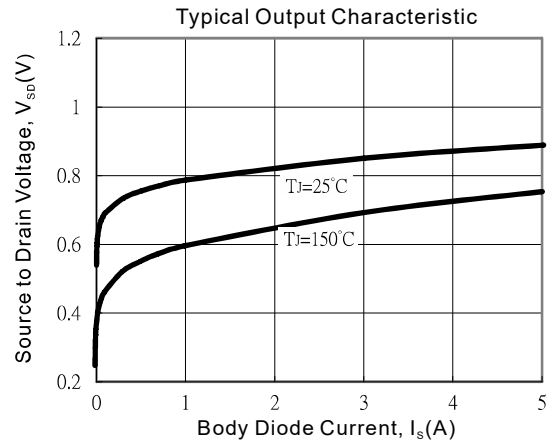
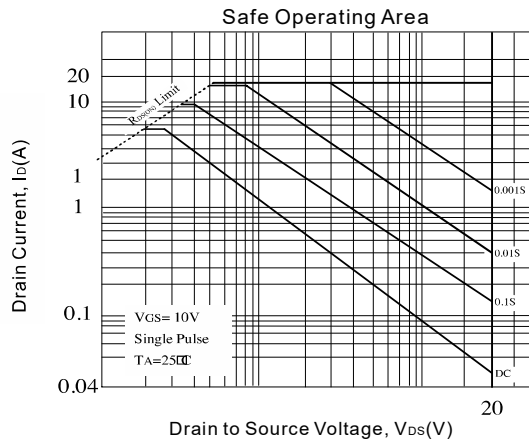
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N-Channel Rating and Characteristic Curves

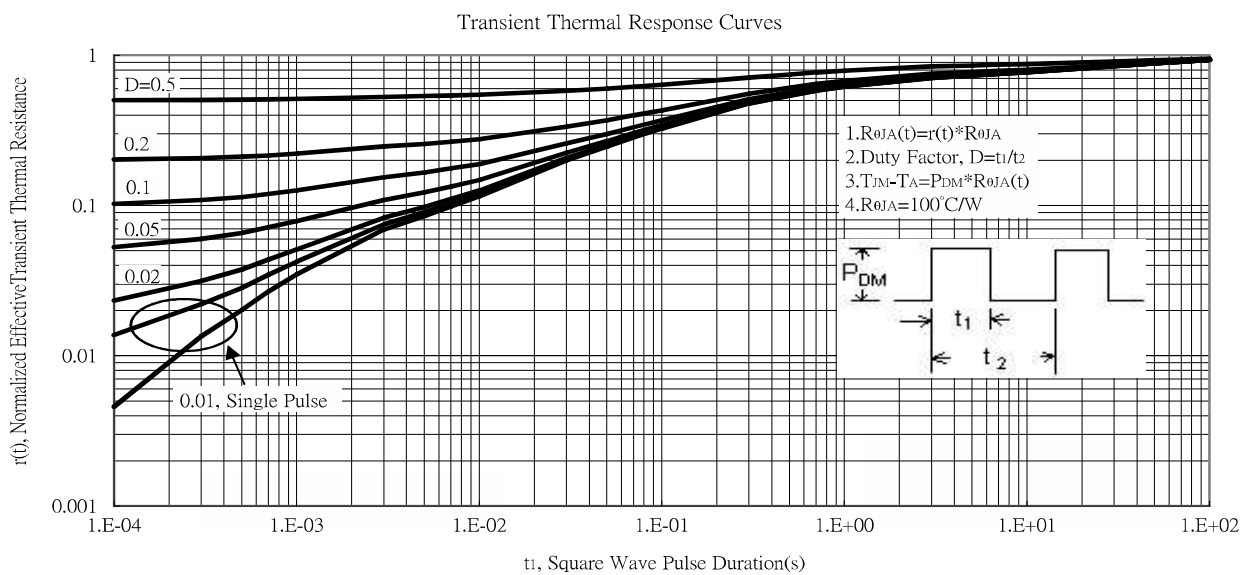


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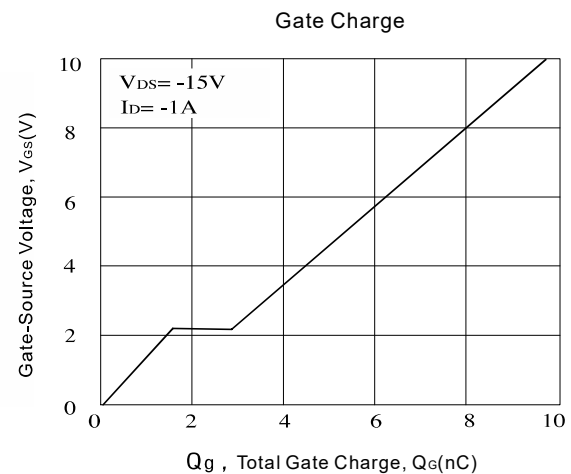
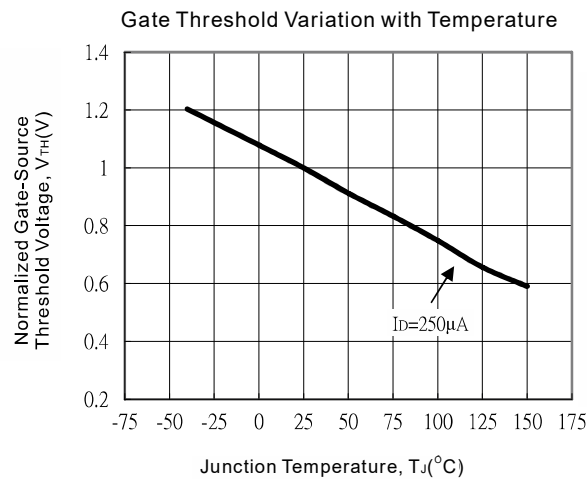
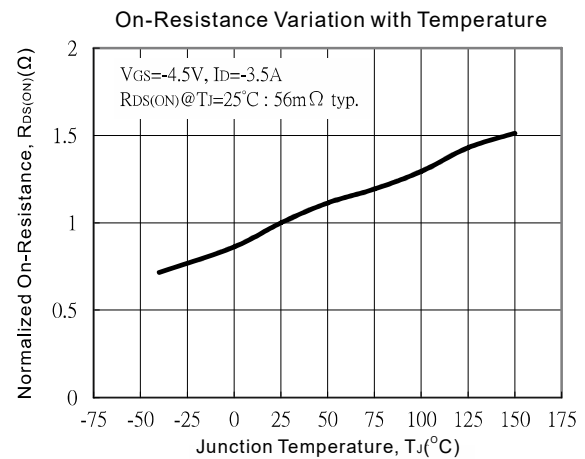
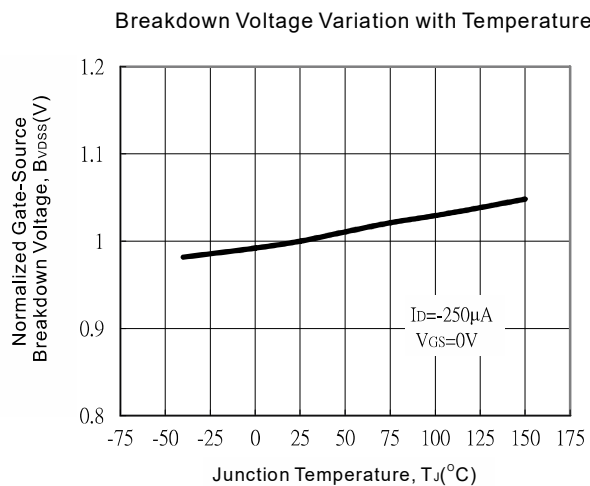
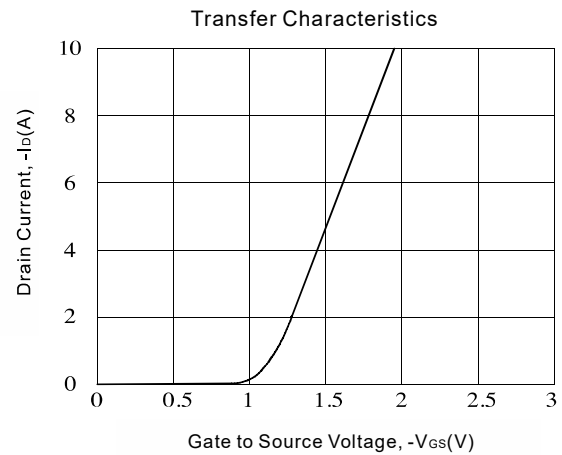
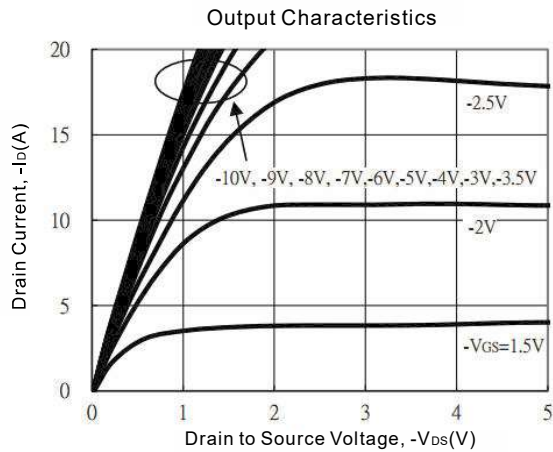


Switching Test Circuit and Switching Waveforms



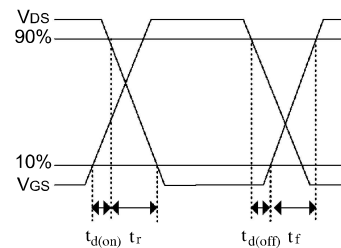
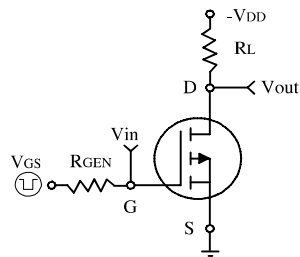
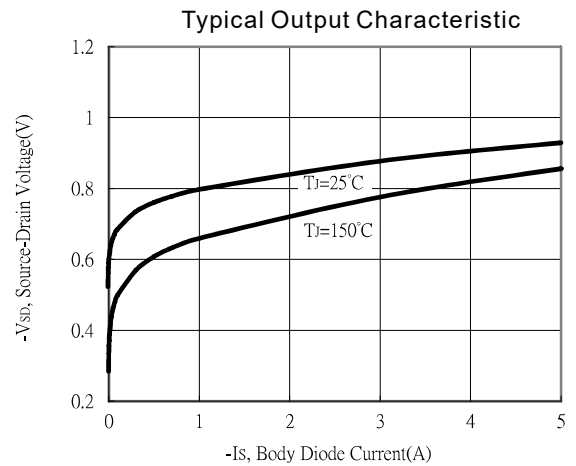
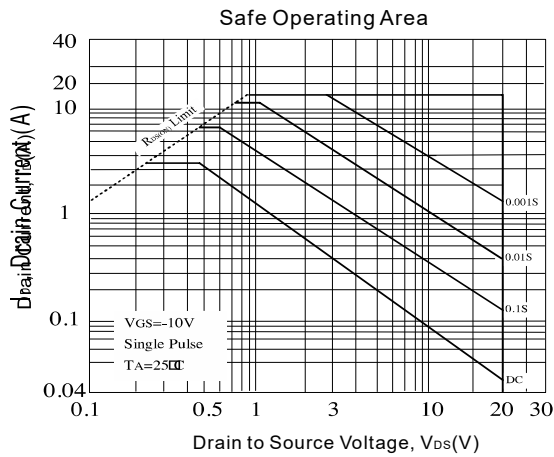
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P-Channel Rating and Characteristic Curves

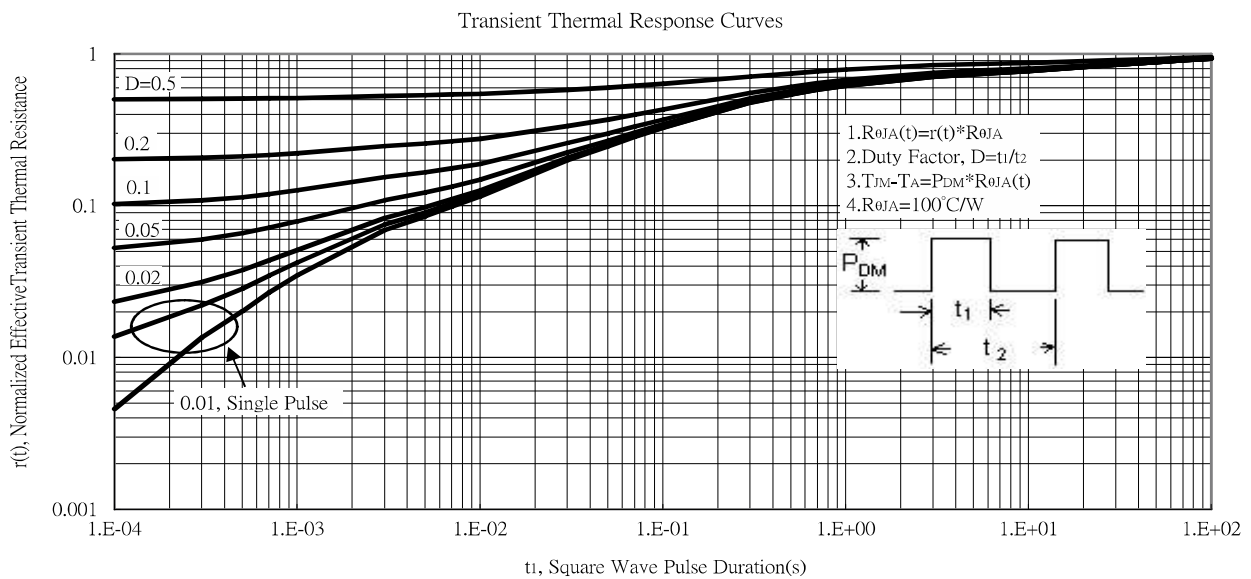


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P-Channel Rating and Characteristic Curves

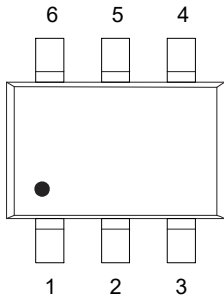
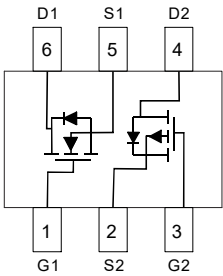


Switching Test Circuit and Switching Waveforms

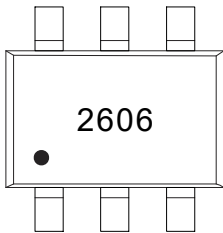


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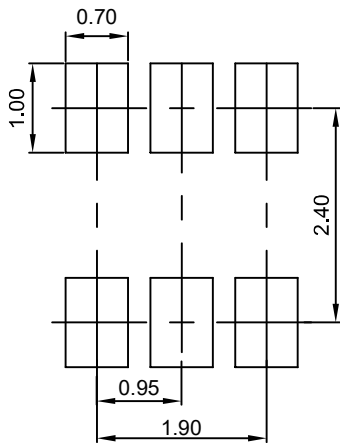
Pinning information

Simplified outline	Symbol
	

Marking

Type number	Marking code
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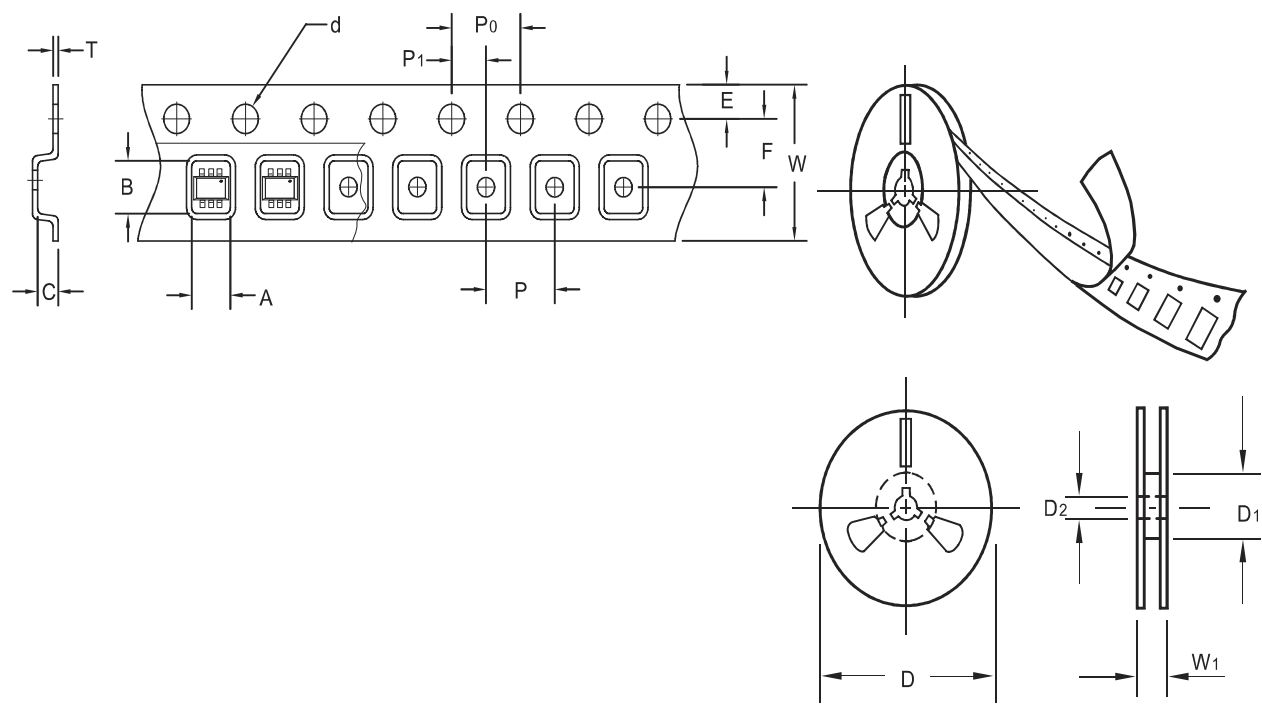
Suggested solder pad layout



Note:
1.Controlling dimension:in millimeters.
2.General tolerance:±0.05mm.
3.The pad layout is for reference purposes only.

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Packing information



unit:mm

Item	Symbol	Tolerance	SOT-23-6
Carrier width	A	0.2	3.10
Carrier length	B	0.2	2.70
Carrier depth	C	0.1	1.20
Sprocket hole	d	0.1	1.50
13" Reel outside diameter	D	2.0	-
13" Reel inner diameter	D1	min	-
7" Reel outside diameter	D	2.0	178.00
7" Reel inner diameter	D1	min	62.00
Feed hole diameter	D2	0.5	13.00
Sprocket hole position	E	0.1	1.75
Punch hole position	F	0.1	3.50
Punch hole pitch	P	0.1	4.00
Sprocket hole pitch	P0	0.1	4.00
Embossment center	P1	0.1	2.00
Overall tape thickness	T	0.1	0.20
Tape width	W	0.3	8.00
Reel width	W1	1.0	11.40

Note: Devices are packed in accordance with EIA standard RS-481-A and specifications listed above.

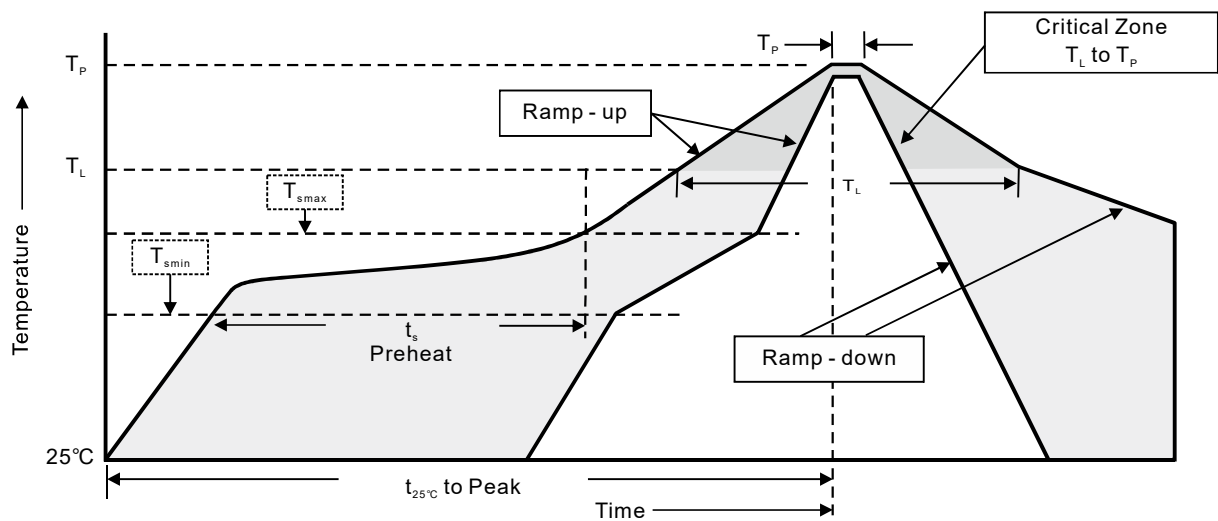
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Reel packing

PACKAGE	REEL SIZE	REEL (pcs)	COMPONENT SPACING (m/m)	BOX (pcs)	INNER BOX (m/m)	REEL DIA, (m/m)	CARTON SIZE (m/m)	CARTON (pcs)	APPROX. GROSS WEIGHT (kg)
SOT-23-6	7"	3,000	4.0	30,000	210*208*203	178	440*435*22.7	180,000	9.5

Suggested thermal profiles for soldering processes

1. Storage environment : Temperature = 5°C ~ 40°C, Humidity = 55%, ±25%.
2. Reflow soldering of surface - Mount devices.



3. Reflow soldering

Profile feature	Soldering condition
Average ramp-up rate (T_L to T_p)	< 3 °C/sec
Preheat - Temperature Min (T_{smin}) - Temperature Max (T_{smax}) - Time (Min to Max) (t_s)	150°C 200°C 60 ~ 120 sec
T_{smax} to T_L - Ramp-up rate	< 3 °C / sec
Time maintained above : - Temperature (T_L) - Time (T_L)	217°C 60 ~ 260 sec
Peak temperature (T_p)	255 °C -0 / +5°C
Time with 5°C of actual peak temperature (T_p)	10 ~ 30 sec
Ramp-down rate	< 6°C / sec
Time 25°C to peak temperature	< 6 minutes