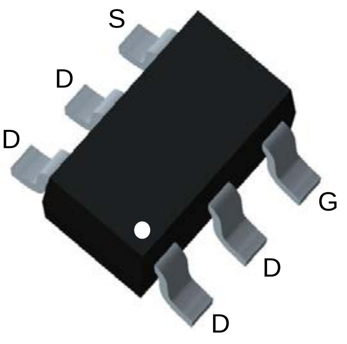
RU30P4C6

P-Channel Advanced Power MOSFET

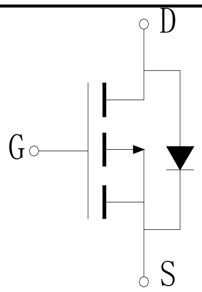
Features

- -30V/-4A,
  $R_{DS\,(ON)}$ =50mΩ(Typ.)@V_{GS}=-10V
  $R_{DS\,(ON)}$ =75mΩ(Typ.)@V_{GS}=-4.5V
- Low On-Resistance
- Super High Dense Cell Design
- Reliable and Rugged
- Lead Free and Green Devices Available (RoHS Compliant)

Pin Description



SOT23-6



P-Channel MOSFET

Applications

- Load Switch
- DC/DC Converter

Absolute Maximum Ratings

Symbol	Parameter		Rating	Unit
Common Ratings (T_A=25°C Unless Otherwise Noted)				
V_{DSS}	Drain-Source Voltage		-30	V
V_{GSS}	Gate-Source Voltage		±20	
T_J	Maximum Junction Temperature		150	°C
T_{STG}	Storage Temperature Range		-55 to 150	°C
I_S	Diode Continuous Forward Current	T_A=25°C	-1.2	A
Mounted on Large Heat Sink				
I_{DP} ①	300μs Pulse Drain Current Tested	T_A=25°C	-16	A
I_D ②	Continuous Drain Current(V_{GS}=-10V)	T_A=25°C	-4	A
		T_A=70°C	-3.2	
P_D	Maximum Power Dissipation	T_A=25°C	1.3	W
		T_A=70°C	0.8	
$R_{\theta JC}$	Thermal Resistance-Junction to Case		-	°C/W
$R_{\theta JA}$ ③	Thermal Resistance-Junction to Ambient		100	°C/W
Drain-Source Avalanche Ratings				
E_{AS} ④	Avalanche Energy, Single Pulsed		TBD	mJ

Electrical Characteristics (T_A=25°C Unless Otherwise Noted)

Symbol	Parameter	Test Condition	RU30P4C6			Unit
			Min.	Typ.	Max.	
Static Characteristics						
BV_{DSS}	Drain-Source Breakdown Voltage	V_{GS}=0V, I_{DS}=-250μA	-30			V
I_{DSS}	Zero Gate Voltage Drain Current	V_{DS}=-30V, V_{GS}=0V			-1	μA
		T_J=125°C			-30	
$V_{GS(th)}$	Gate Threshold Voltage	V_{DS}=V_{GS}, I_{DS}=-250μA	-1		-3	V
I_{GSS}	Gate Leakage Current	V_{GS}=±20V, V_{DS}=0V			±100	nA
$R_{DS(ON)}$ ⑤	Drain-Source On-state Resistance	V_{GS}=-10V, I_{DS}=-4A		50	70	mΩ
		V_{GS}=-4.5V, I_{DS}=-3A		75	100	mΩ
Diode Characteristics						
V_{SD} ⑤	Diode Forward Voltage	I_{SD}=-1A, V_{GS}=0V			-1.2	V
t_{rr}	Reverse Recovery Time	I_{SD}=-4A, dI_{SD}/dt=100A/μs		21		ns
Q_{rr}	Reverse Recovery Charge			10		nC
Dynamic Characteristics⑥						
R_G	Gate Resistance	V_{GS}=0V,V_{DS}=0V,F=1MHz		1		Ω
C_{iss}	Input Capacitance	V_{GS}=0V, V_{DS}=-15V, Frequency=1.0MHz		520		pF
C_{oss}	Output Capacitance			130		
C_{rss}	Reverse Transfer Capacitance			65		
$t_{d(ON)}$	Turn-on Delay Time	V_{DD}=-15V, I_{DS}=-4A, V_{GEN}=-10V,R_G=6Ω		8		ns
t_r	Turn-on Rise Time			17		
$t_{d(OFF)}$	Turn-off Delay Time			24		
t_f	Turn-off Fall Time			10		
Gate Charge Characteristics⑥						
Q_g	Total Gate Charge	V_{DS}=-24V, V_{GS}=-10V, I_{DS}=-4A		9		nC
Q_{gs}	Gate-Source Charge			2.2		
Q_{gd}	Gate-Drain Charge			2.9		

Notes:

①Pulse width limited by safe operating area.
②Calculated continuous current based on maximum allowable junction temperature.
③When mounted on 1 inch square copper board, t⩽10sec. The value in any given application depends on the user's specific board design.
④Limited by $T_{Jmax.}$ Starting T_J = 25°C.
⑤Pulse test;Pulse width⩽300μs, duty cycle⩽2%.
⑥Guaranteed by design, not subject to production testing.

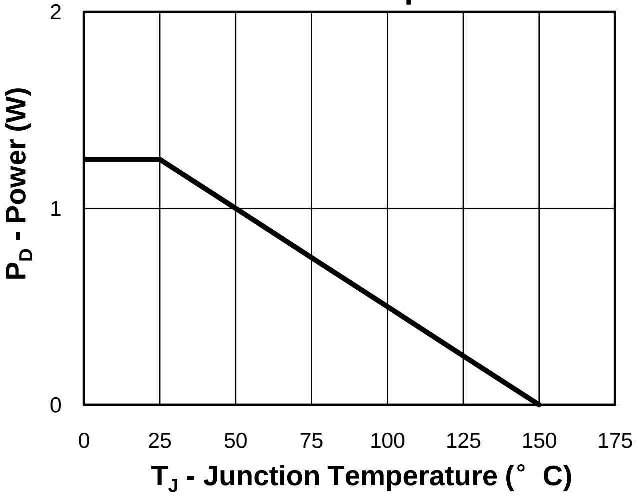
Ordering and Marking Information

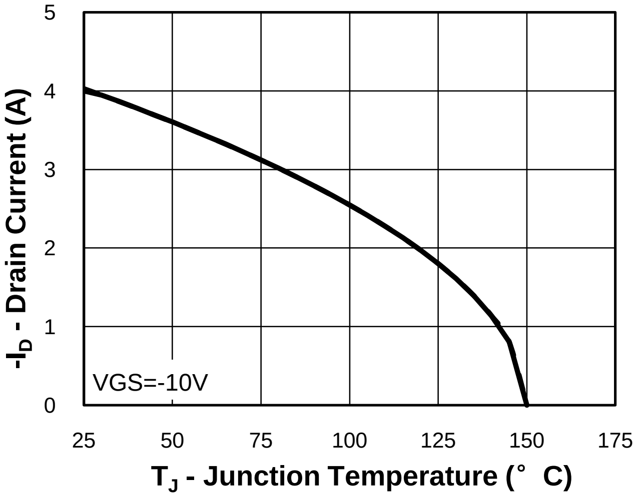
Device	Marking①	Package	Packaging	Quantity	Reel Size	Tape width
RU30P4C6	FXYWW	SOT23-6	Tape&Reel	3000	7''	8mm

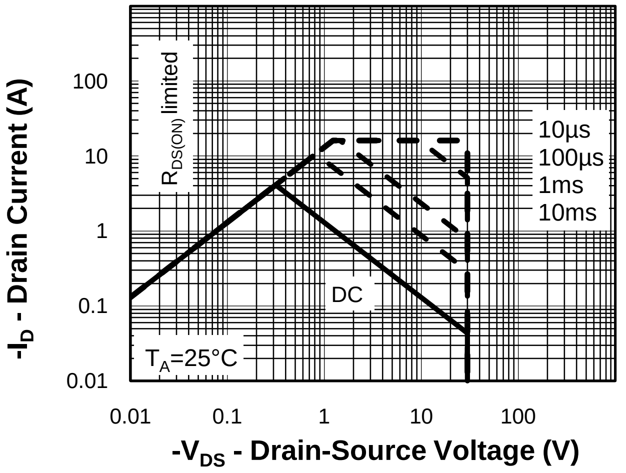
① The following characters could be different and means:

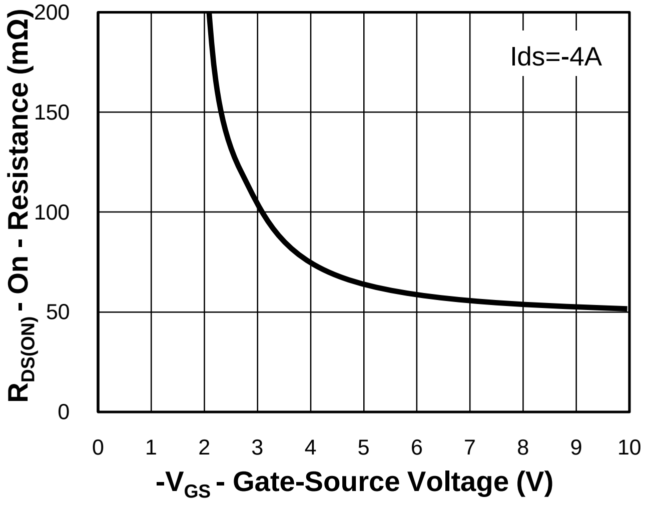
X =Assembly site code
Y =Year
WW =Work Week

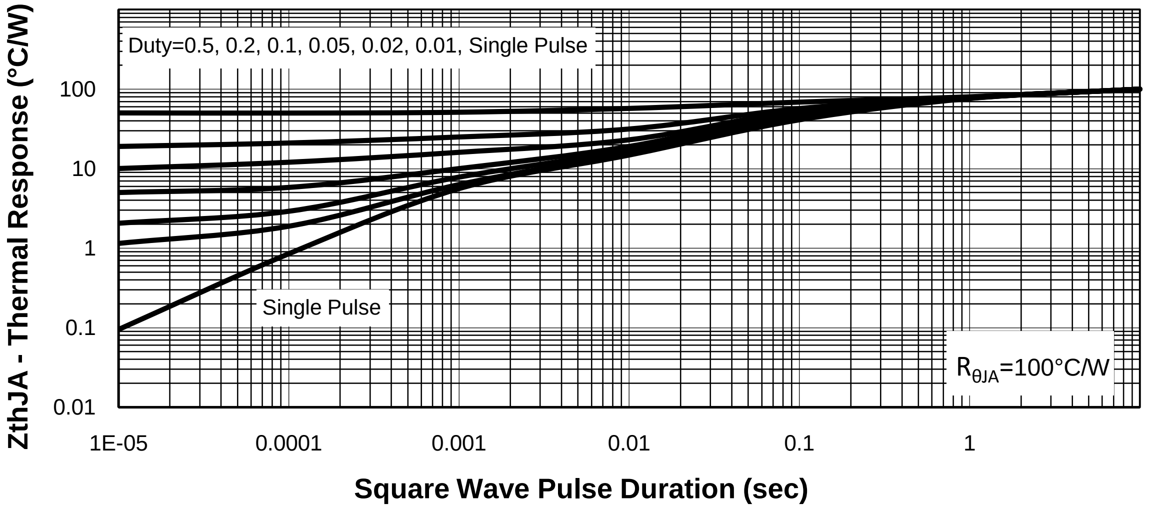
Typical Characteristics


Power Dissipation

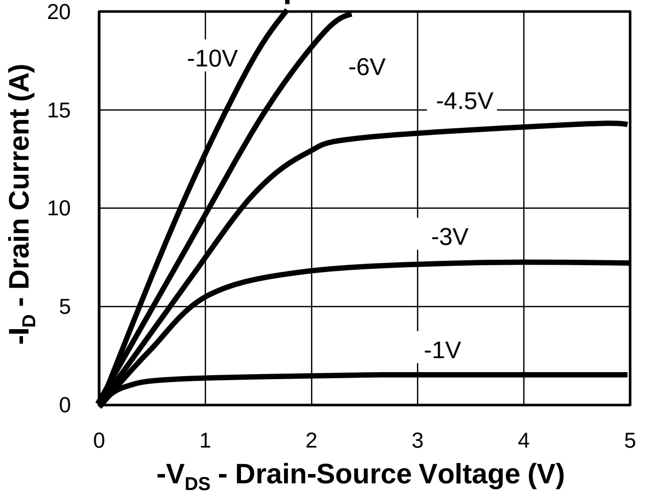

Drain Current

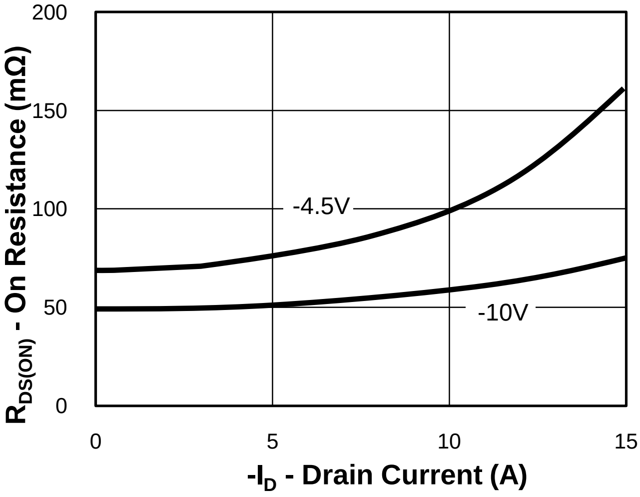

Safe Operation Area

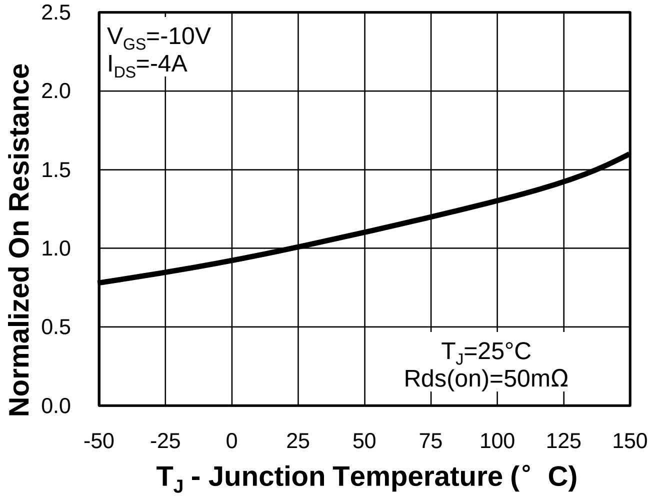

Drain Current

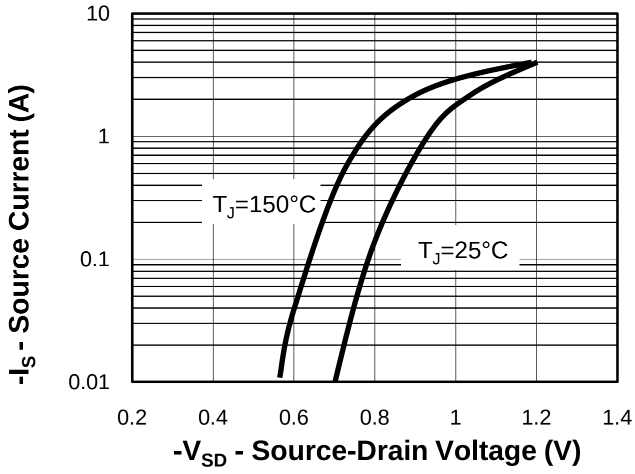

Thermal Transient Impedance

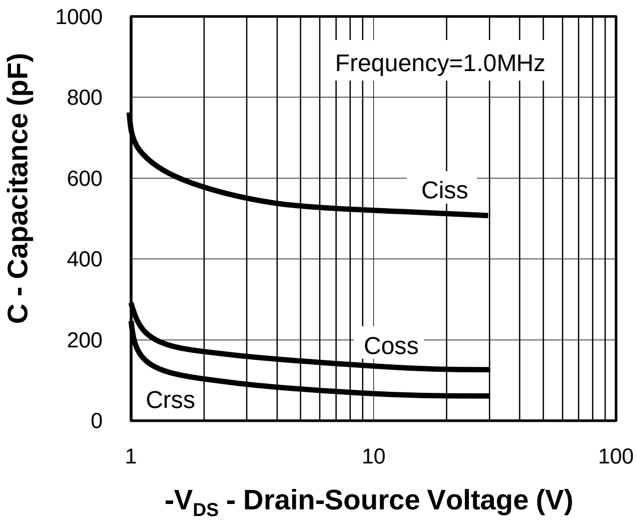
Typical Characteristics

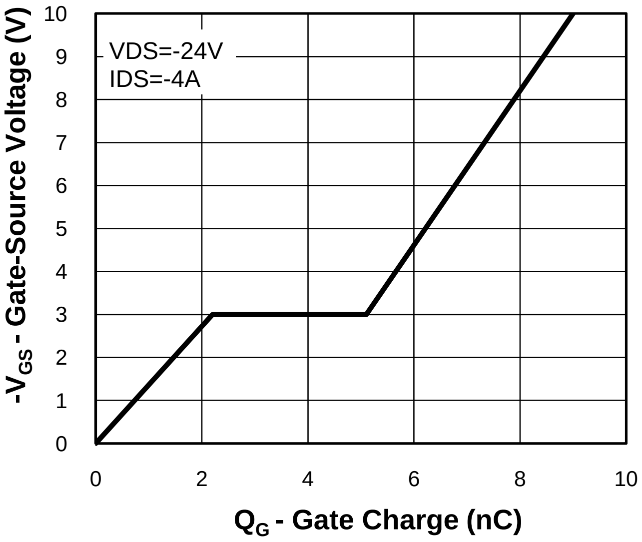

Output Characteristics


Drain-Source On Resistance

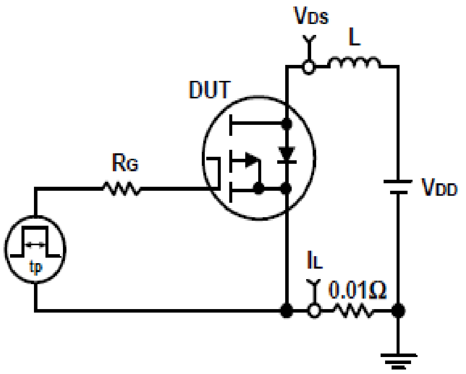

Drain-Source On Resistance

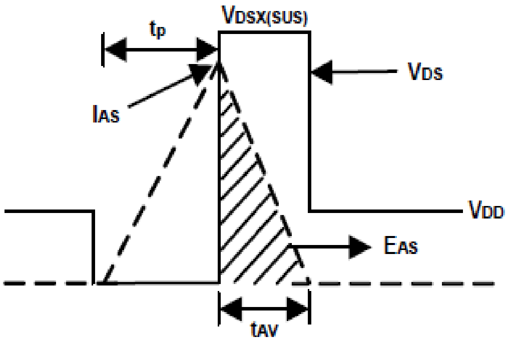

Source-Drain Diode Forward


Capacitance

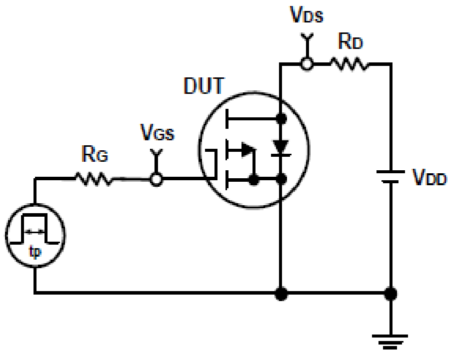

Gate Charge

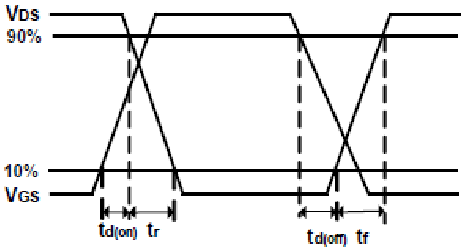
Avalanche Test Circuit and Waveforms





Switching Time Test Circuit and Waveforms





Package Information

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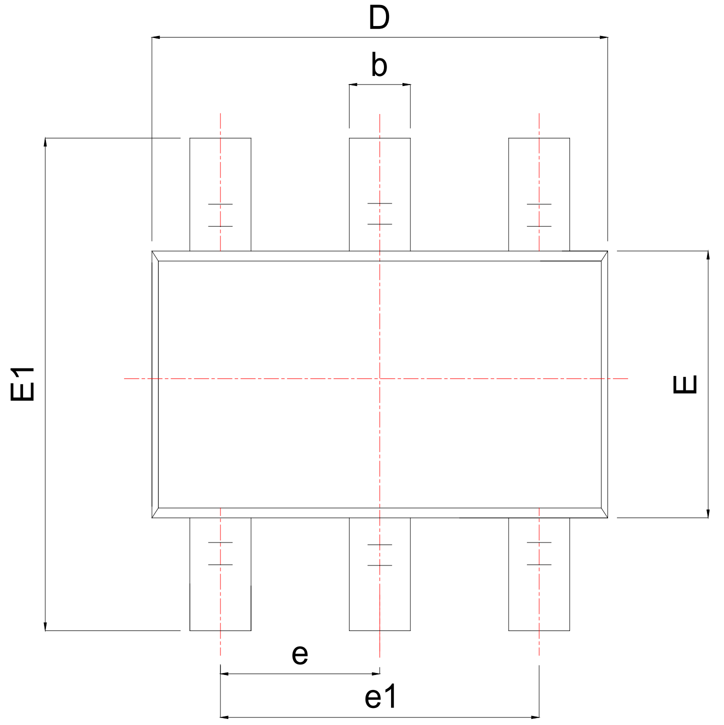

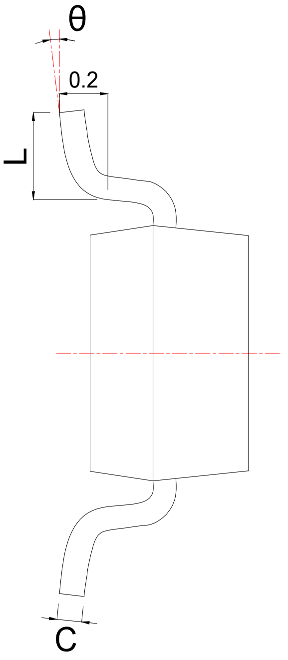

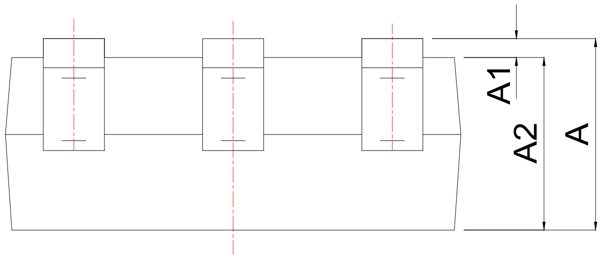

SYMBOL	MM			INCH		
	MIN	NOM	MAX	MIN	NOM	MAX
A	0.950	1.150	1.450	0.037	0.045	0.057
A1	0.000	0.060	0.150	0.000	0.002	0.006
A2	0.940	1.100	1.300	0.037	0.044	0.051
b	0.300	0.400	0.500	0.012	0.016	0.020
c	0.080	0.140	0.200	0.003	0.006	0.008
D	2.800	2.900	3.020	0.110	0.114	0.119
E	1.500	1.600	1.700	0.059	0.063	0.067
E1	2.650	2.800	2.950	0.104	0.110	0.116
e	0.950BSC			0.037BSC		
e1	1.800	1.900	2.000	0.071	0.075	0.079
L	0.300	0.450	0.600	0.012	0.018	0.024
θ	0°	4°	8°	0°	4°	8°

Customer Service

Worldwide Sales and Service:
Sales@ruichips.com

Technical Support:
Technical@ruichips.com

Investor Relations Contacts:
Investor@ruichips.com

Marcom Contact:
Marcom@ruichips.com

Editorial Contact:
Editorial@ruichips.comm

HR Contact:
HR@ruichips.com

Legal Contact:
Legal@ruichips.com

Shen Zhen RUICHIPS Semiconductor CO., LTD
Room 501, the 5floor An Tong Industrial Building,
NO.207 Mei Hua Road Fu Tian Area Shen Zhen City, CHINA

TEL: (86-755) 8311-5334
FAX: (86-755) 8311-4278
E-mail: Sales-SZ@ruichips.com