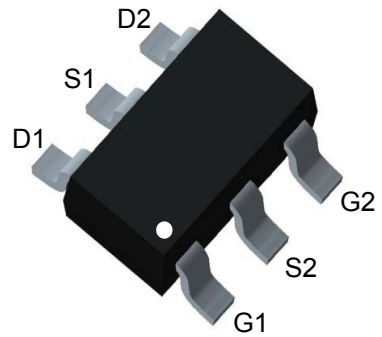
Features

• N-Channel
20V/4A,
$R_{DS\ (ON)}$ =30mΩ(Typ.) @ V_{GS}=4.5V
$R_{DS\ (ON)}$ =38mΩ(Typ.) @ V_{GS}=2.5V
• P-Channel
-20V/-2.5A,
$R_{DS\ (ON)}$ =70mΩ (Typ.) @ V_{GS}=-4.5V
$R_{DS\ (ON)}$ =100mΩ (Typ.) @ V_{GS}=-2.5V
• Reliable and Rugged
• Lead Free and Green Devices Available (RoHS Compliant)

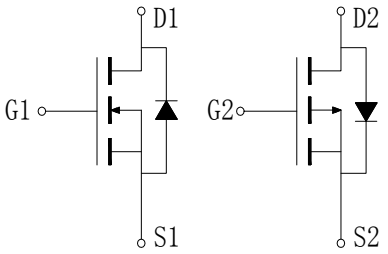
Applications

• Load Switch

Pin Description



SOT23-6



Complementary MOSFET

Absolute Maximum Ratings

Symbol	Parameter		N-Channel	P-Channel	Unit
Common Ratings (T_A=25°C Unless Otherwise Noted)					
V_{DSS}	Drain-Source Voltage		20	-20	V
V_{GSS}	Gate-Source Voltage		±12	±12	
T_J	Maximum Junction Temperature		150	150	°C
T_{STG}	Storage Temperature Range		-55 to 150	-55 to 150	°C
I_S	Diode Continuous Forward Current	T_A=25°C	1.4	-1.1	A
Mounted on Large Heat Sink					
I_{DP} ①	300μs Pulse Drain Current Tested	T_A=25°C	16	-10	A
I_D ②	Continuous Drain Current(V_{GS}=±4.5V)	T_A=25°C	4	-2.5	A
		T_A=70°C	3.2	-2	
P_D	Maximum Power Dissipation	T_A=25°C	1.25	1.25	W
		T_A=70°C	0.8	0.8	
$R_{\theta JC}$	Thermal Resistance-Junction to Case		TBD	TBD	°C/W
$R_{\theta JA}$ ③	Thermal Resistance-Junction to Ambient		100	100	°C/W
Drain-Source Avalanche Ratings					
E_{AS} ④	Avalanche Energy, Single Pulsed		TBD	TBD	mJ

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

Symbol	Parameter	Test Condition		RU20C4C6 Min.	RU20C4C6 Typ.	RU20C4C6 Max.	Unit
Static Characteristics							
BV_{DSS}	Drain-Source Breakdown Voltage	V_{GS}=0V, I_{DS}=250μA	N	20			V
		V_{GS}=0V, I_{DS}=-250μA	P	-20			
I_{DSS}	Zero Gate Voltage Drain Current	V_{DS}=20V, V_{GS}=0V	N			1	μA
		T_J=125°C	N			30	
		V_{DS}=-20V, V_{GS}=0V	P			-1	
		T_J=125°C	P			-30	
$V_{GS(th)}$	Gate Threshold Voltage	V_{DS}=V_{GS}, I_{DS}=250μA	N	0.5		1.5	V
		V_{DS}=V_{GS}, I_{DS}=-250μA	P	-0.5		-1.5	
I_{GSS}	Gate Leakage Current	V_{GS}=±12V, V_{DS}=0V	N			±100	nA
		V_{GS}=±12V, V_{DS}=0V	P			±100	
$R_{DS(ON)}$ ⑤	Drain-Source On-state Resistance	V_{GS}=4.5V, I_{DS}=4A	N		30	45	mΩ
		V_{GS}=-4.5V, I_{DS}=-2.5A	P		70	100	
		V_{GS}=2.5V, I_{DS}=3.5A	N		38	55	
		V_{GS}=-2.5V, I_{DS}=-2A	P		100	130	
Diode Characteristics							
V_{SD} ⑤	Diode Forward Voltage	I_{SD}=4A, V_{GS}=0V	N			1.2	V
		I_{SD}=-2.5A, V_{GS}=0V	P			-1.2	
t_{rr}	Reverse Recovery Time	N-Channel I_{SD}=4A, dI_{SD}/dt=100A/μs	N		13		ns
			P		13		
Q_{rr}	Reverse Recovery Charge	P-Channel I_{SD}=-2.5A, dI_{SD}/dt=100A/μs	N		4		nC
			P		6		
Dynamic Characteristics ⑥							
R_G	Gate Resistance	V_{GS}=0V,V_{DS}=0V,F=1MHz	N		0.8		Ω
			P		2		
C_{iss}	Input Capacitance	N-Channel V_{GS}=0V,V_{DS}=10V, Frequency=1.0MHz	N		208		pF
			P		480		
C_{oss}	Output Capacitance	P-Channel V_{GS}=0V,V_{DS}=-10V, Frequency=1.0MHz	N		30		
			P		120		
C_{rss}	Reverse Transfer Capacitance		N		18		
			P		40		

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

Symbol	Parameter	Test Condition		RU20C4C6			Unit
				Min.	Typ.	Max.	
Dynamic Characteristics⑥							
$t_{d(ON)}$	Turn-on Delay Time	N-Channel V_{DD}=10V, I_{DS}=4A, V_{GEN}=4.5V, R_G=1.2Ω	N		6		ns
			P		8		
t_r	Turn-on Rise Time		N		10		
			P		13		
$t_{d(OFF)}$	Turn-off Delay Time	P-Channel V_{DD}=-10V, I_{DS}=-2.5A, V_{GEN}= -4.5V, R_G=0.3Ω	N		14		
			P		25		
t_f	Turn-off Fall Time		N		7		
			P		12		
Gate Charge Characteristics⑥							
Q_g	Total Gate Charge	N-Channel V_{DS}=16V, V_{GS}=4.5V, I_{DS}=4A	N		4		nC
			P		7		
Q_{gs}	Gate-Source Charge	P-Channel V_{DS}=-16V, V_{GS}= -4.5V, I_{DS}=-2.5A	N		0.5		
			P		1.5		
Q_{gd}	Gate-Drain Charge		N		1.2		
			P		2.5		

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	Marking	Package	Packaging	Quantity	Reel Size	Tape width
RU20C4C6	GXYWW	SOT23-6	Tape&Reel	3000	7''	8mm

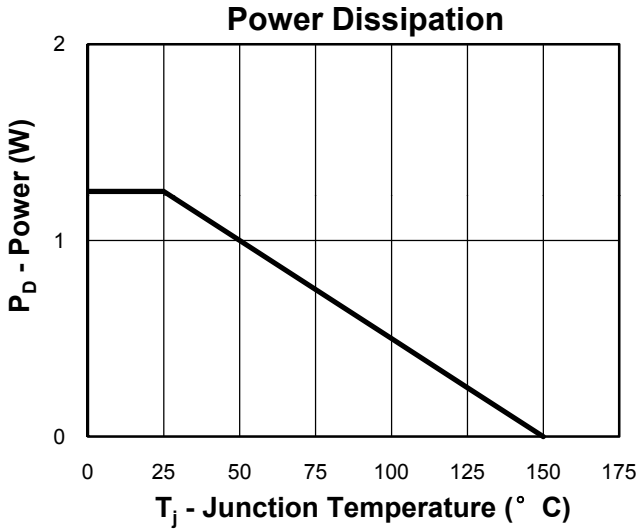
① The following characters could be different and means:

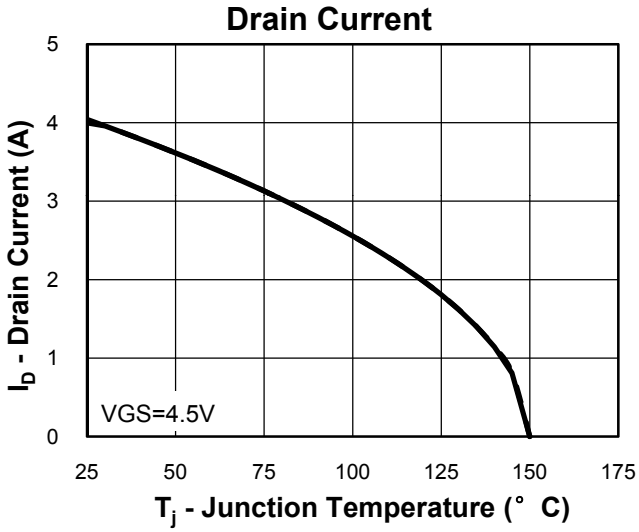
X =Assembly site code

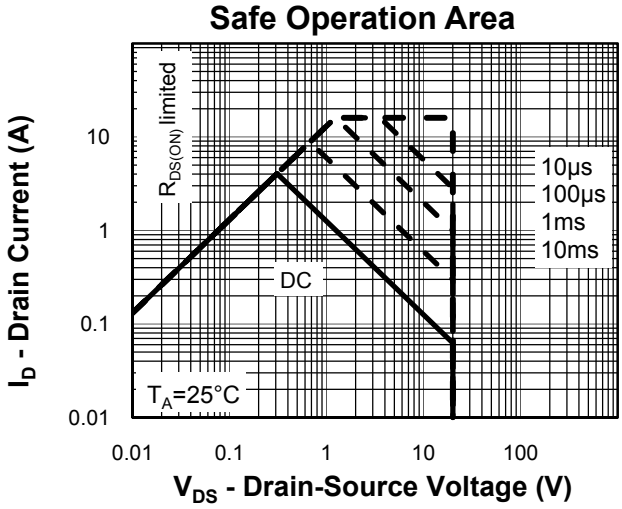
Y =Year

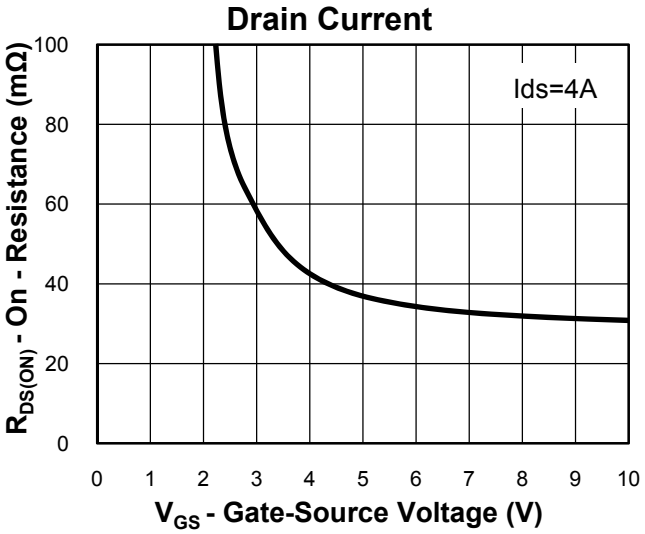
WW =Work Week

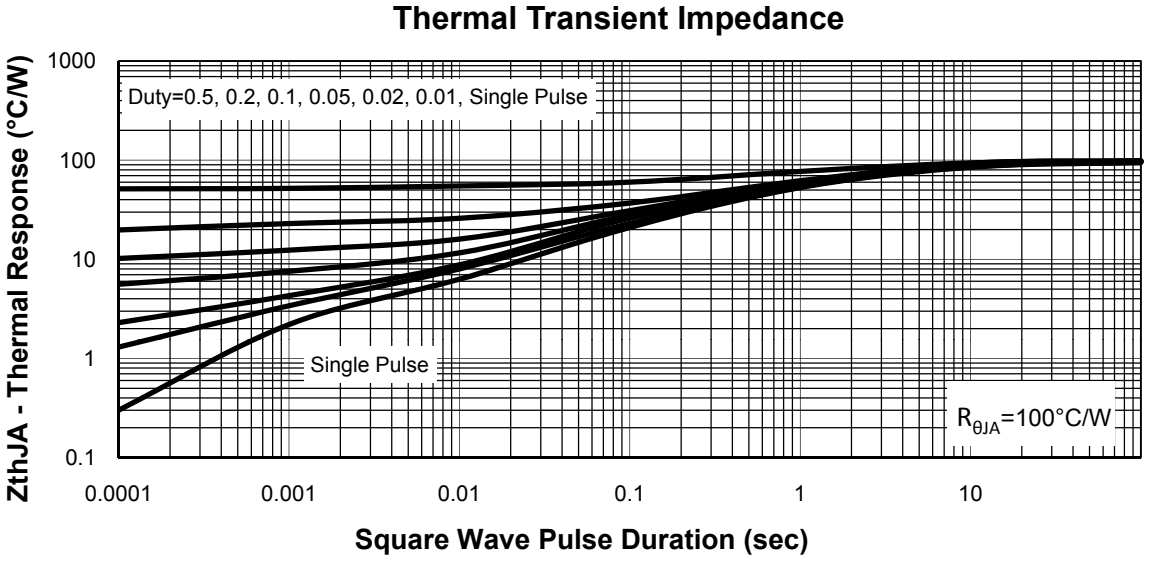
Typical Characteristics(N-Channel)



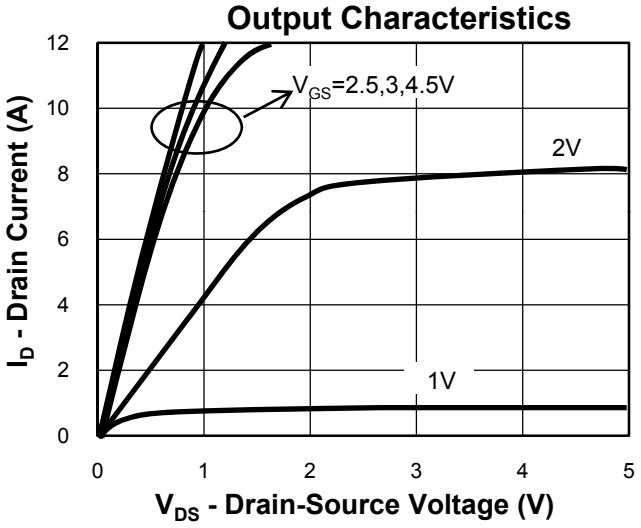


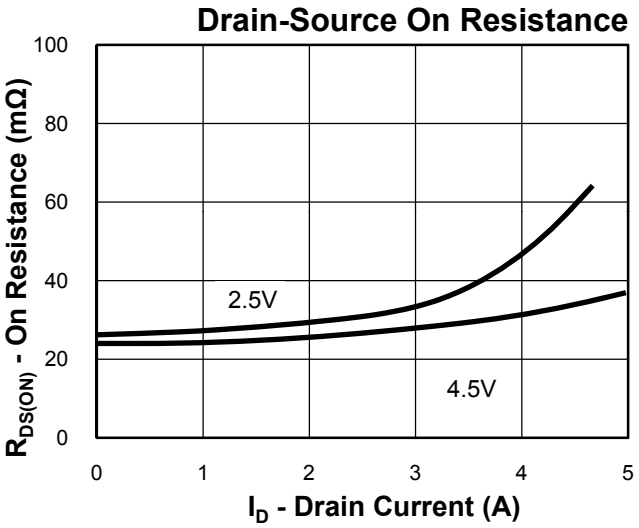


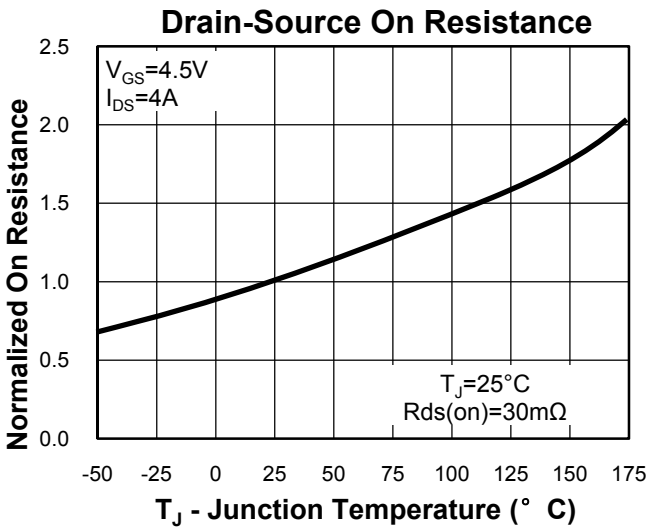


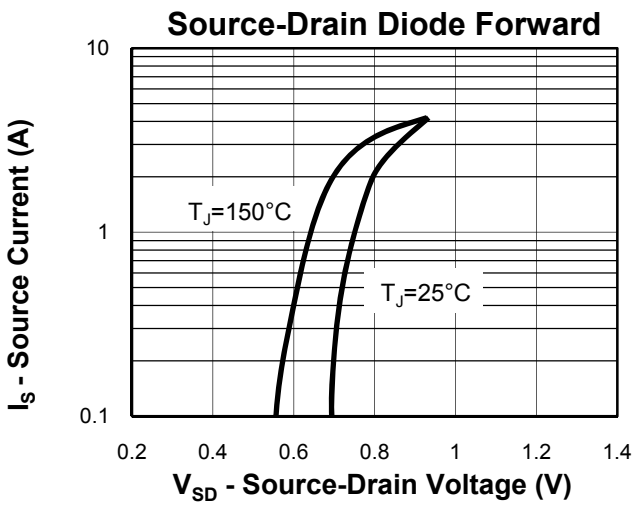


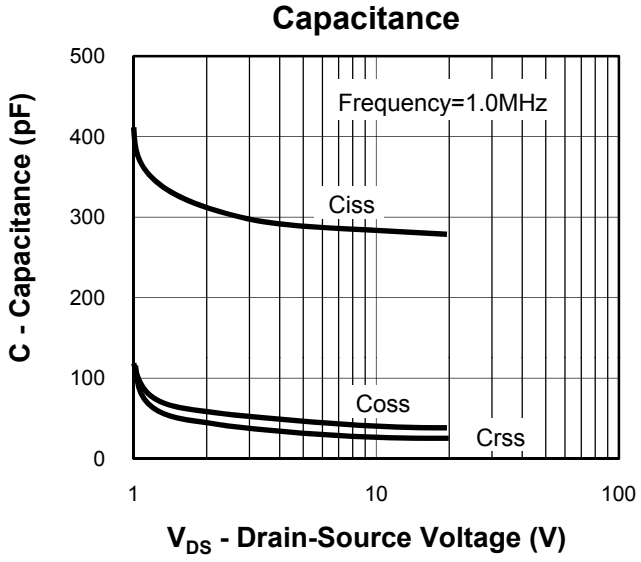
Typical Characteristics(N-Channel)

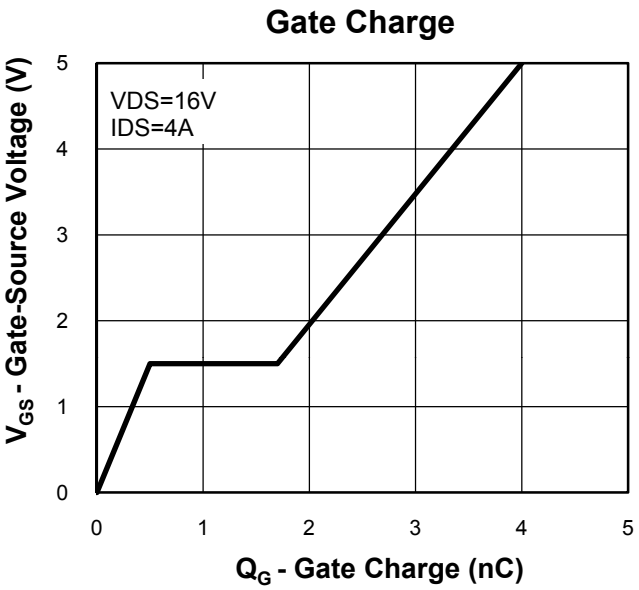




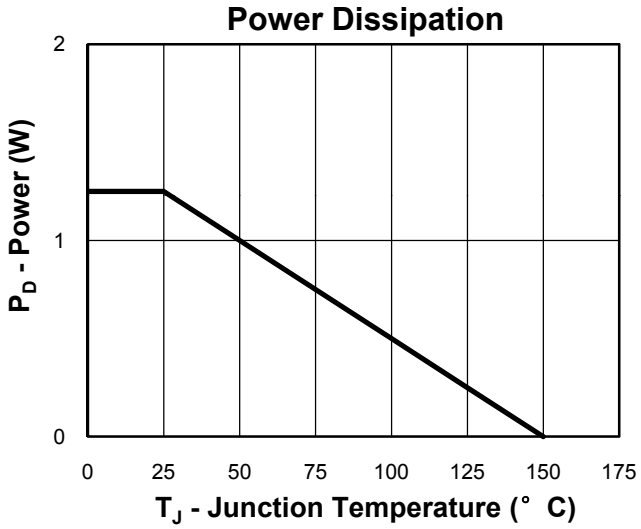


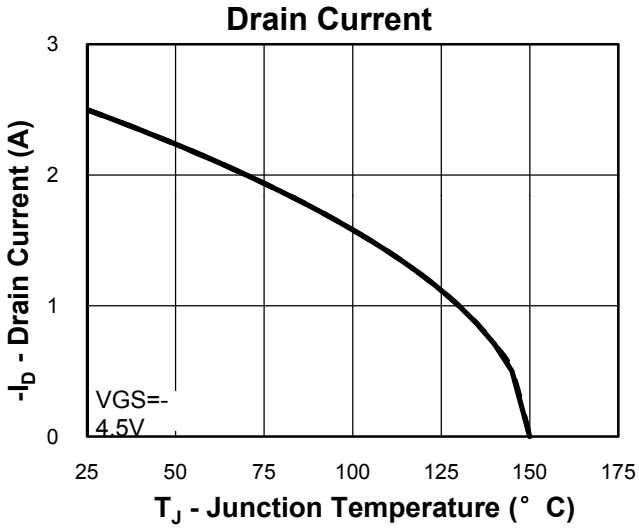


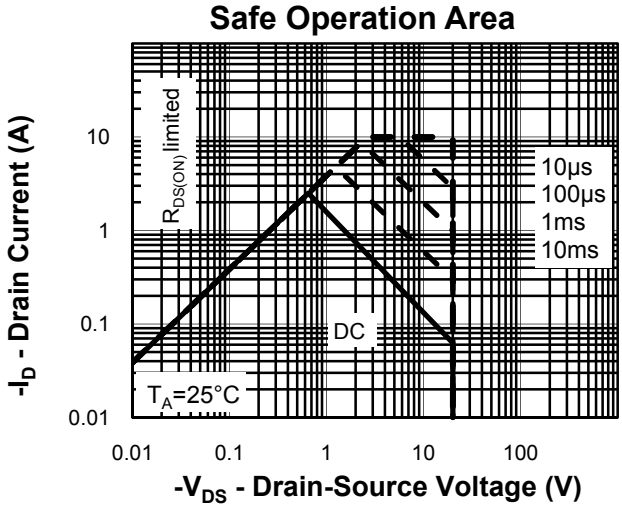


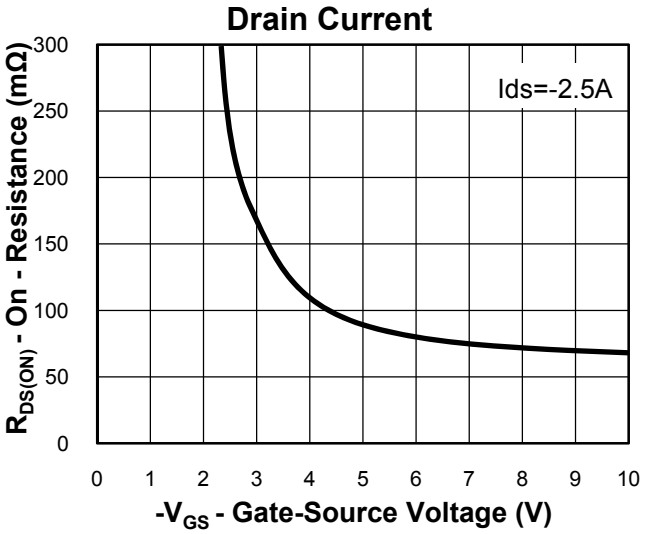


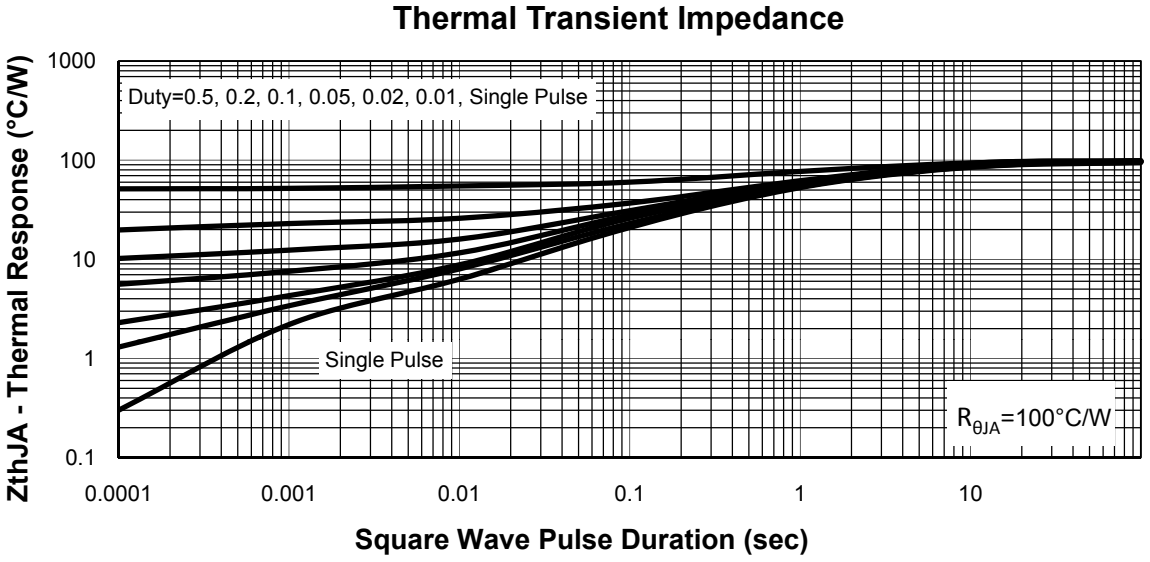
Typical Characteristics(P-Channel)



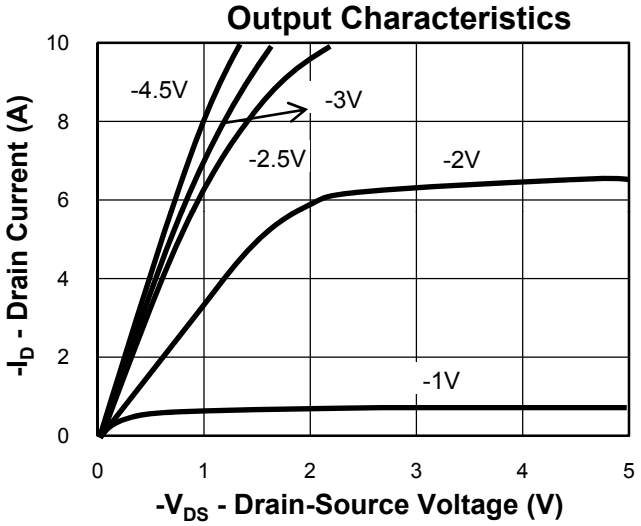


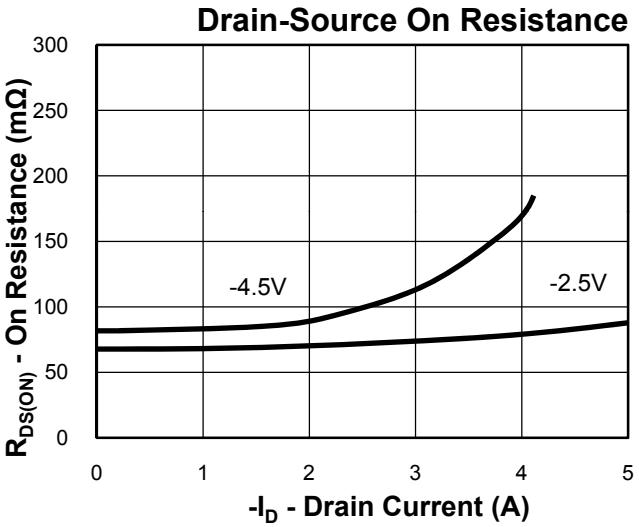


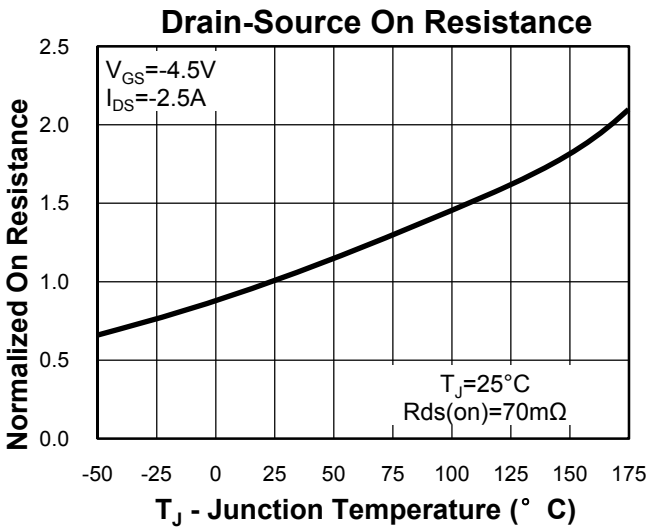


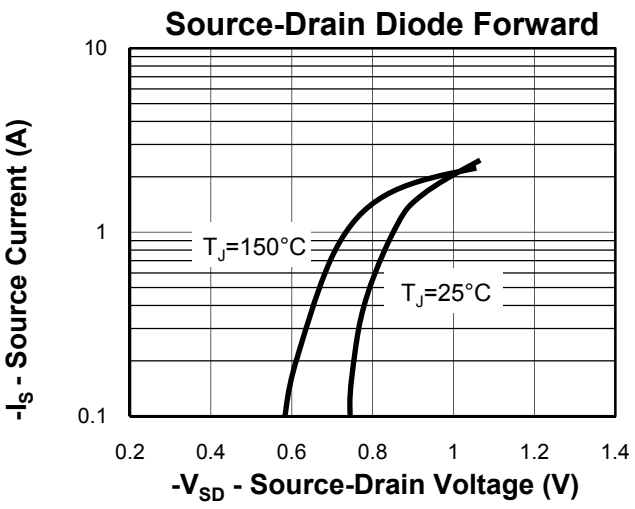


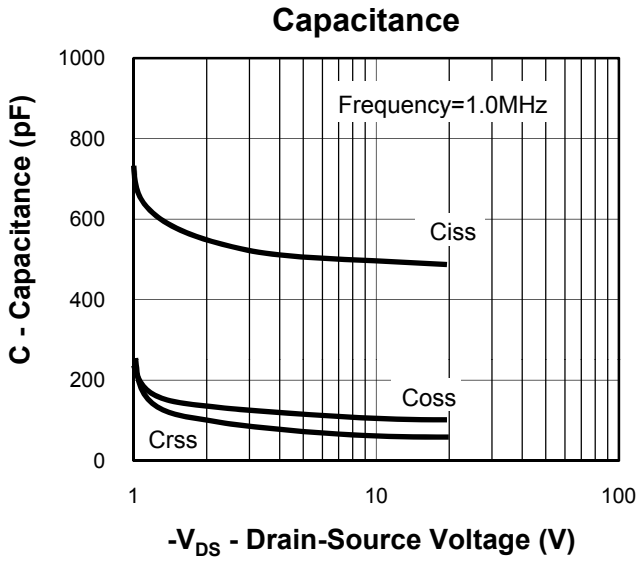
Typical Characteristics(P-Channel)

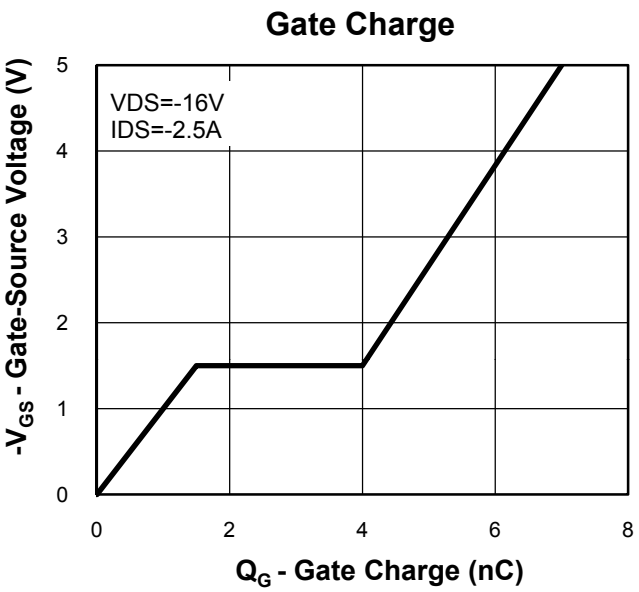






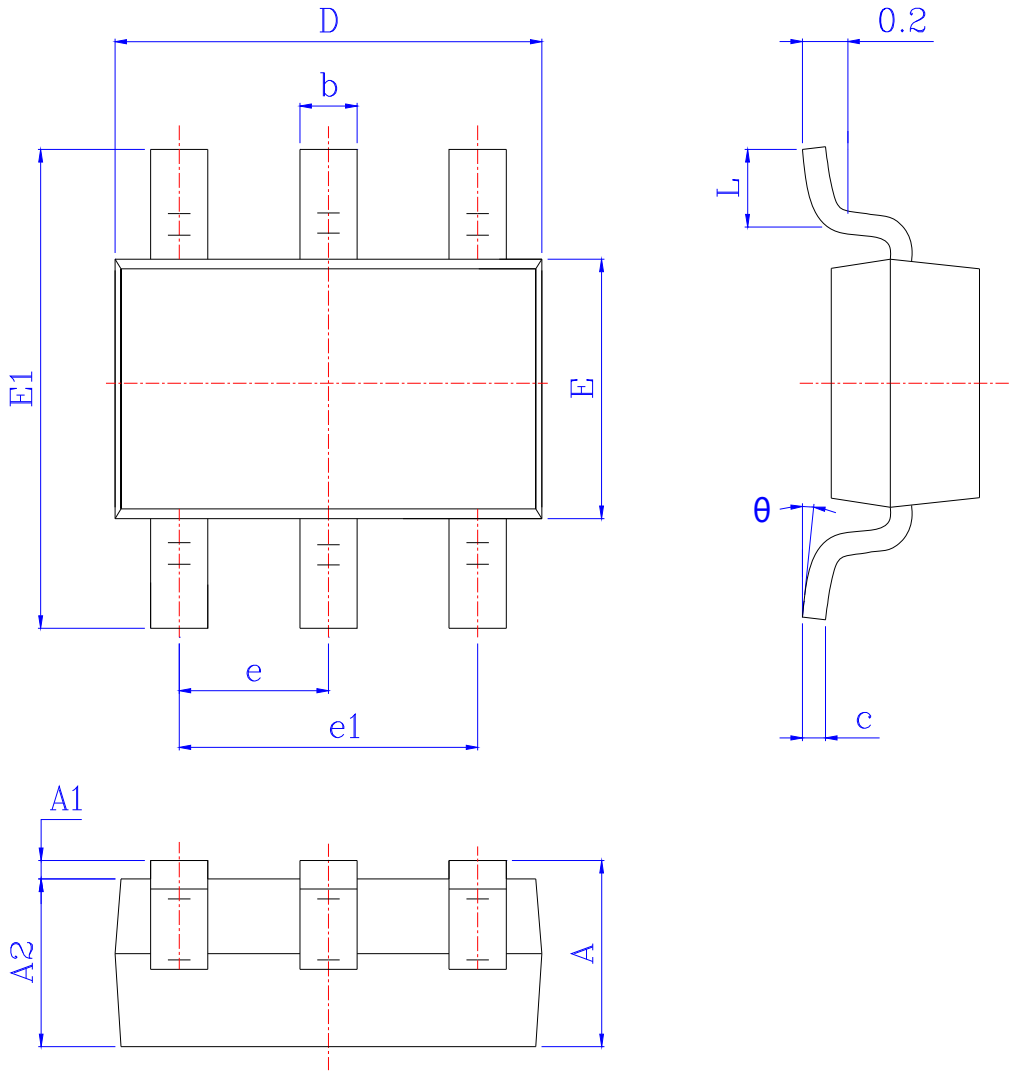






Package Information

SOT23-6



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	0.900	1.100	1.300	0.035	0.043	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	3.050	0.110	0.114	0.120
E	1.500	1.600	1.750	0.059	0.063	0.069
E1	2.600	2.800	3.000	0.102	0.110	0.118
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°

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