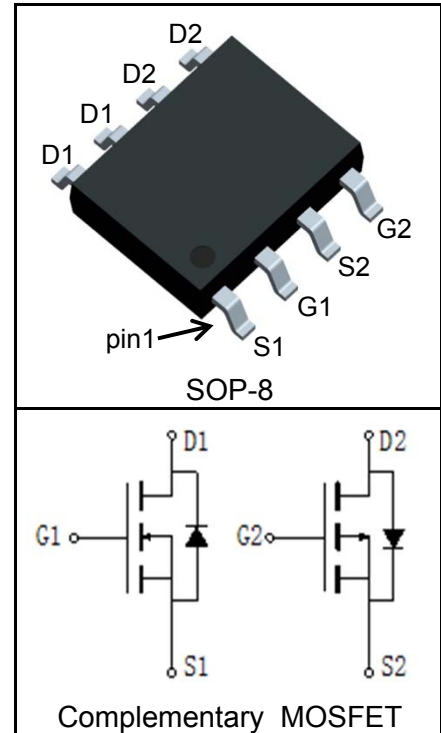


**Features**

- N-Channel  
20V/10A,  
 $R_{DS(ON)} = 12m\Omega$  (Typ.) @  $V_{GS} = 4.5V$   
 $R_{DS(ON)} = 15m\Omega$  (Typ.) @  $V_{GS} = 2.5V$
- P-Channel  
-20V/-10A,  
 $R_{DS(ON)} = 20m\Omega$  (Typ.) @  $V_{GS} = -4.5V$   
 $R_{DS(ON)} = 30m\Omega$  (Typ.) @  $V_{GS} = -2.5V$
- Reliable and Rugged
- Lead Free and Green Devices Available (RoHS Compliant)

**Applications**

- Load Switch

**Pin Description**

**Absolute Maximum Ratings**

Symbol	Parameter	N-Channel	P-Channel	Unit	
<b>Common Ratings</b> ( $T_A = 25^\circ C$ Unless Otherwise Noted)					
$V_{DSS}$	Drain-Source Voltage	20	-20	V	
$V_{GSS}$	Gate-Source Voltage	$\pm 12$	$\pm 12$		
$T_J$	Maximum Junction Temperature	150	150	$^\circ C$	
$T_{STG}$	Storage Temperature Range	-55 to 150	-55 to 150	$^\circ C$	
$I_S$	Diode Continuous Forward Current	$T_A = 25^\circ C$	1	1	A
<b>Mounted on Large Heat Sink</b>					
$I_{DP}^{①}$	300 $\mu s$ Pulse Drain Current Tested	$T_A = 25^\circ C$	40	40	A
$I_D^{②}$	Continuous Drain Current ( $V_{GS} = \pm 10V$ )	$T_A = 25^\circ C$	10	-10	A
		$T_A = 70^\circ C$	5	-5	
$P_D$	Maximum Power Dissipation	$T_A = 25^\circ C$	1.25	1.25	W
		$T_A = 70^\circ C$	0.75	0.75	
$R_{\theta JC}$	Thermal Resistance-Junction to Case	TBD	TBD	$^\circ C/W$	
$R_{\theta JA}^{③}$	Thermal Resistance-Junction to Ambient	62.5	62.5	$^\circ C/W$	
<b>Drain-Source Avalanche Ratings</b>					
$E_{AS}^{④}$	Avalanche Energy, Single Pulsed	TBD	TBD	mJ	

**Electrical Characteristics** ( $T_A=25^{\circ}\text{C}$  Unless Otherwise Noted)

Symbol	Parameter	Test Condition	RU20C10H			Unit	
			Min.	Typ.	Max.		
<b>Static Characteristics</b>							
$BV_{DSS}$	Drain-Source Breakdown Voltage	$V_{GS}=0V, I_{DS}=250\mu A$	N	20		V	
		$V_{GS}=0V, I_{DS}=-250\mu A$	P	-20			
$I_{DSS}$	Zero Gate Voltage Drain Current	$V_{DS}=20V, V_{GS}=0V$	N		1	$\mu A$	
		$T_J=125^{\circ}\text{C}$			30		
		$V_{DS}=-20V, V_{GS}=0V$	P		-1		
		$T_J=125^{\circ}\text{C}$			-30		
$V_{GS(th)}$	Gate Threshold Voltage	$V_{DS}=V_{GS}, I_{DS}=250\mu A$	N	0.5	0.7	1.1	V
		$V_{DS}=V_{GS}, I_{DS}=-250\mu A$	P	-0.4	0.7	-1.1	
$I_{GSS}$	Gate Leakage Current	$V_{GS}=\pm 12V, V_{DS}=0V$	N			$\pm 10$	$\mu A$
		$V_{GS}=\pm 12V, V_{DS}=0V$	P			$\pm 10$	
$R_{DS(ON)}^{(5)}$	Drain-Source On-state Resistance	$V_{GS}=4.5V, I_{DS}=5A$	N		12	14	m $\Omega$
		$V_{GS}=-4.5V, I_{DS}=-5A$	P		20	25	
		$V_{GS}=2.5V, I_{DS}=4A$	N		15	18	
		$V_{GS}=-2.5V, I_{DS}=-4A$	P		30	35	
<b>Diode Characteristics</b>							
$V_{SD}^{(5)}$	Diode Forward Voltage	$I_{SD}=5A, V_{GS}=0V$	N			1.2	V
		$I_{SD}=-5A, V_{GS}=0V$	P			-1.2	
$t_{rr}$	Reverse Recovery Time	N-Channel $I_{SD}=10A, dI_{SD}/dt=100A/\mu s$	N		15		ns
			P		17		
$Q_{rr}$	Reverse Recovery Charge	P-Channel $I_{SD}=-10A, dI_{SD}/dt=100A/\mu s$	N		8		nC
			P		23		
<b>Dynamic Characteristics</b> <sup>(6)</sup>							
$R_G$	Gate Resistance	$V_{GS}=0V, V_{DS}=0V, F=1\text{MHz}$	N		1.5		$\Omega$
			P		1.3		
$C_{iss}$	Input Capacitance	N-Channel $V_{GS}=0V, V_{DS}=10V,$ Frequency=1.0MHz	N		590		pF
			P		640		
$C_{oss}$	Output Capacitance	P-Channel $V_{GS}=0V, V_{DS}=-10V,$ Frequency=1.0MHz	N		125		
			P		135		
$C_{rss}$	Reverse Transfer Capacitance	Frequency=1.0MHz	N		90		
			P		85		

**Electrical Characteristics** ( $T_A=25^{\circ}\text{C}$  Unless Otherwise Noted)

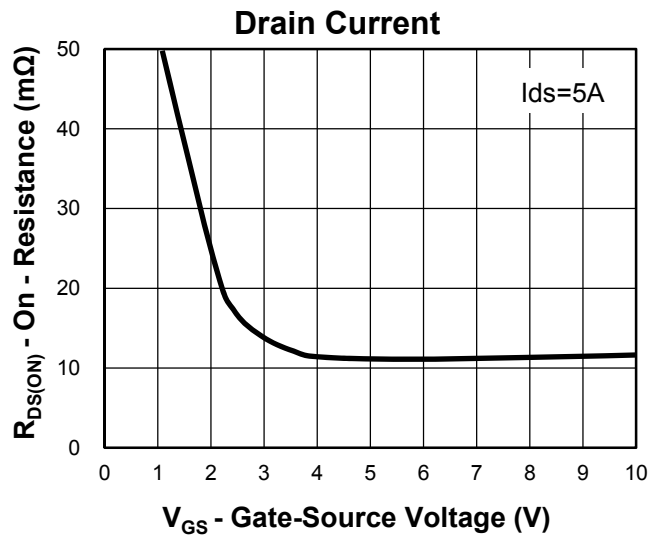
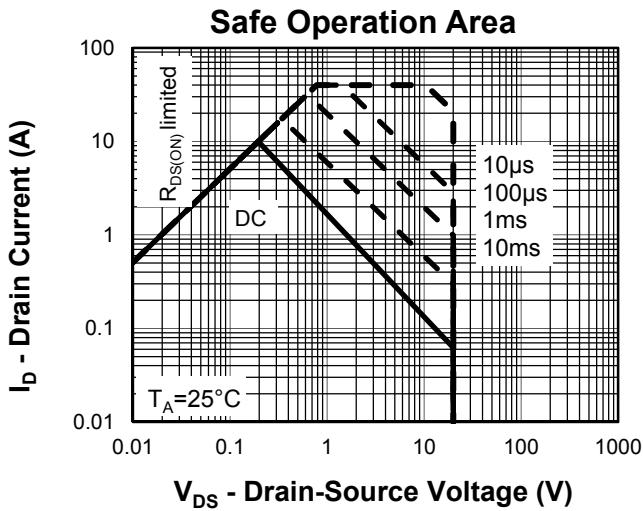
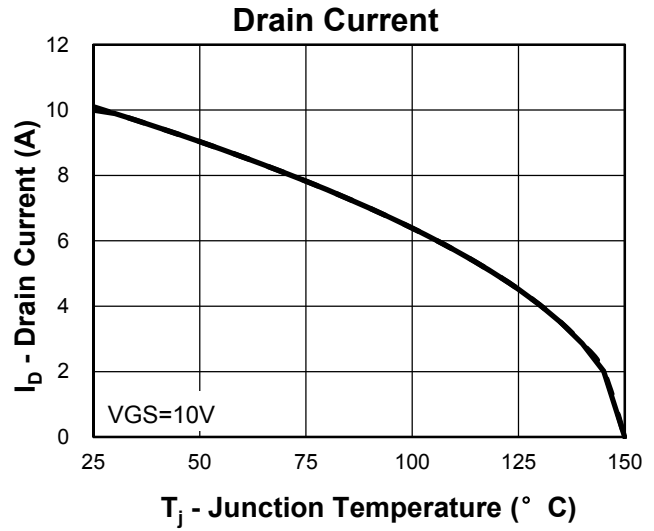
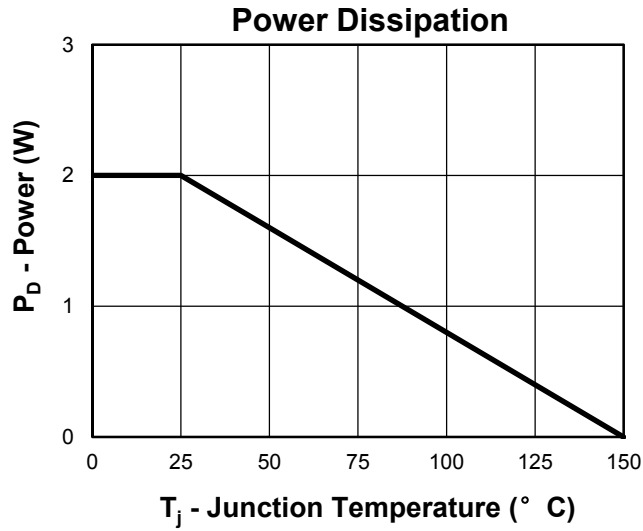
Symbol	Parameter	Test Condition	RU20C10H			Unit	
			Min.	Typ.	Max.		
<b>Dynamic Characteristics</b> <sup>⑥</sup>							
$t_{d(ON)}$	Turn-on Delay Time	N-Channel $V_{DD}=10\text{V}, I_{DS}=10\text{A},$ $V_{GEN}=4.5\text{V}, R_G=4.7\Omega$  P-Channel $V_{DD}=-10\text{V}, I_{DS}=-10\text{A},$ $V_{GEN}= -4.5\text{V}, R_G=4.7\Omega$	N		8		ns
			P		9		
$t_r$	Turn-on Rise Time		N		15		
			P		15		
$t_{d(OFF)}$	Turn-off Delay Time		N		33		
			P		34		
$t_f$	Turn-off Fall Time	N		13			
		P		15			
<b>Gate Charge Characteristics</b> <sup>⑥</sup>							
$Q_g$	Total Gate Charge	N-Channel $V_{DS}=16\text{V}, V_{GS}=4.5\text{V},$ $I_{DS}=10\text{A}$  P-Channel $V_{DS}=-16\text{V}, V_{GS}= -4.5\text{V},$ $I_{DS}=-10\text{A}$	N		10		nC
			P		10		
$Q_{gs}$	Gate-Source Charge		N		1.4		
			P		2		
$Q_{gd}$	Gate-Drain Charge		N		3.6		
			P		3		

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

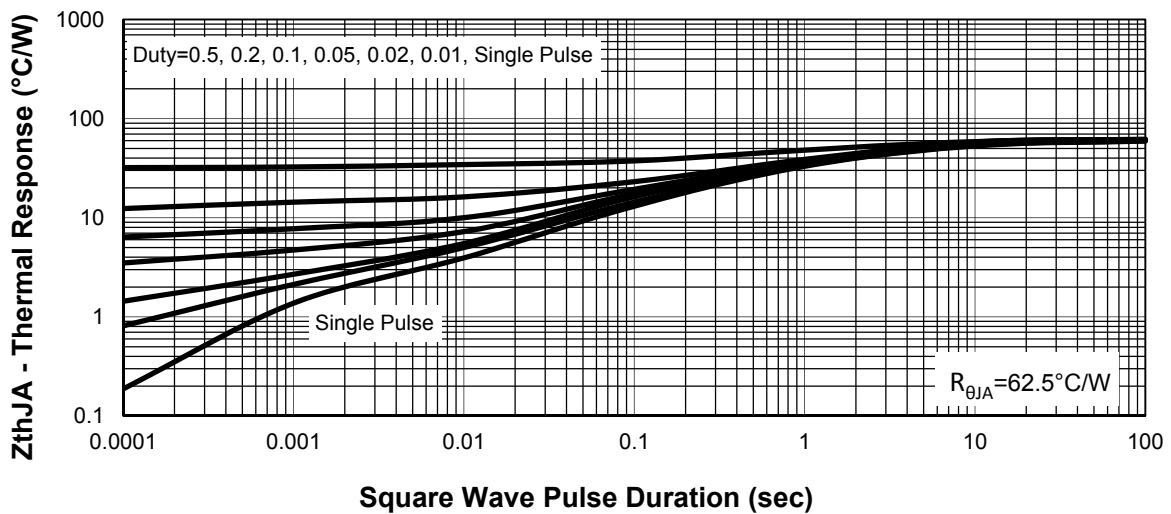
**Ordering and Marking Information**

<b>Device</b>	<b>Marking</b>	<b>Package</b>	<b>Packaging</b>	<b>Quantity</b>	<b>Reel Size</b>	<b>Tape width</b>
RU20C10H	RU20C10H	SOP-8	Tape&Reel	2500	13"	12mm

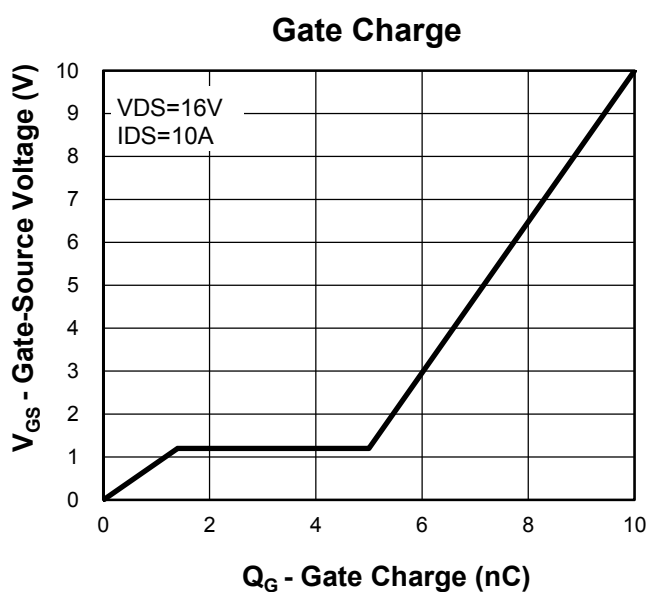
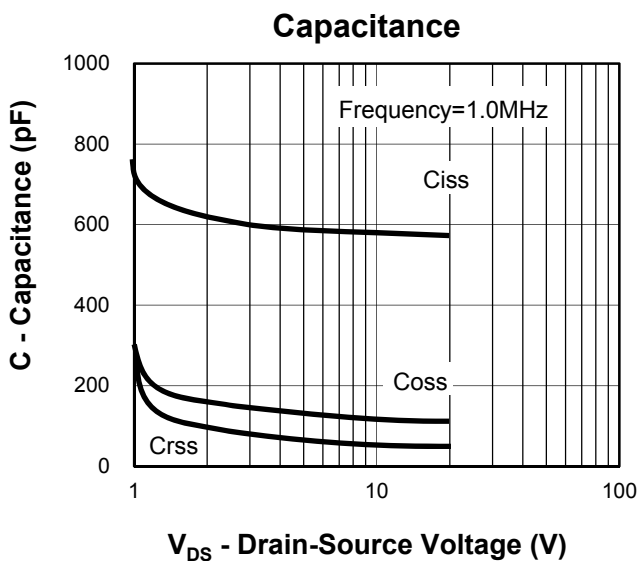
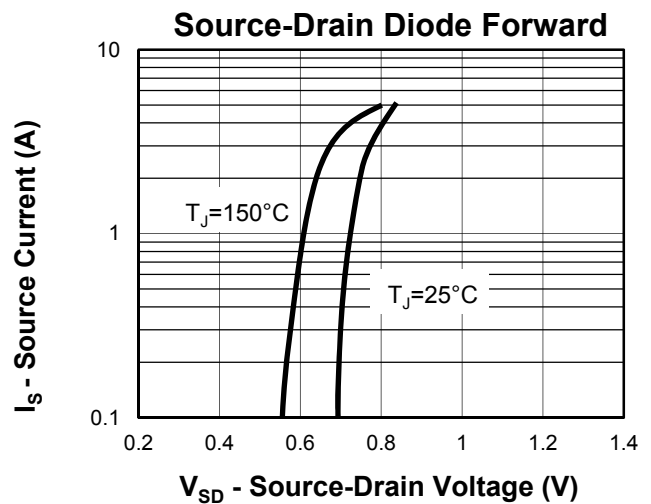
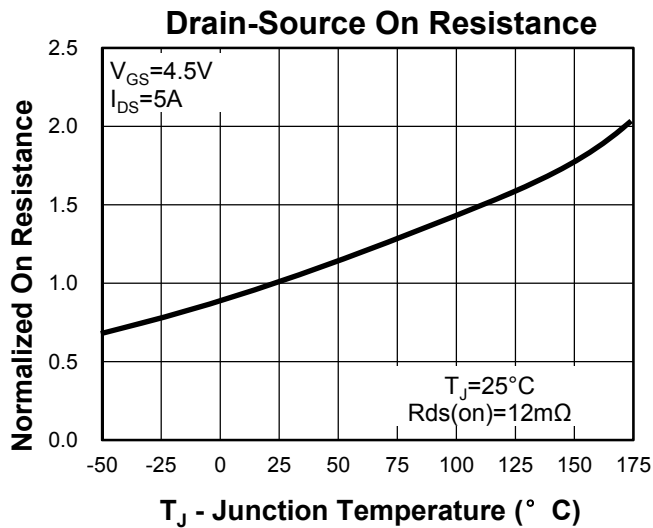
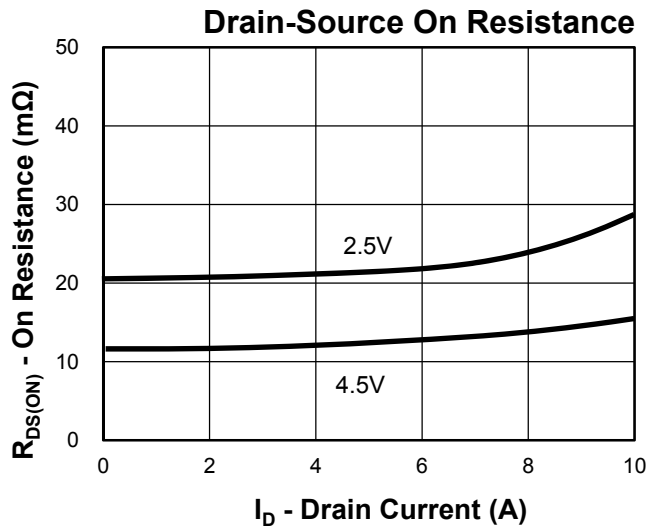
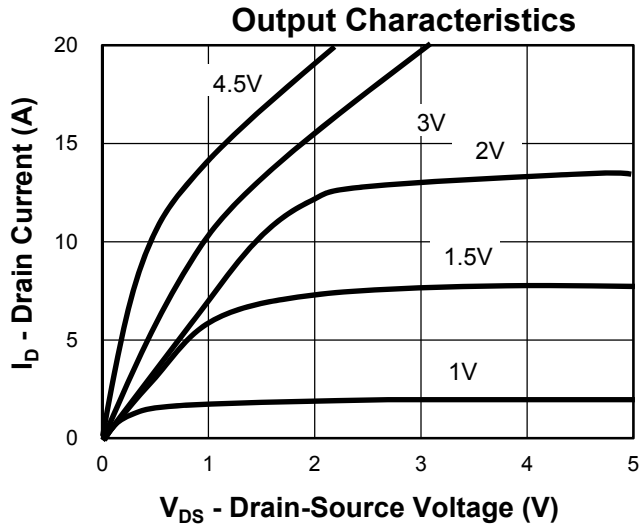
**Typical Characteristics(N-Channel)**



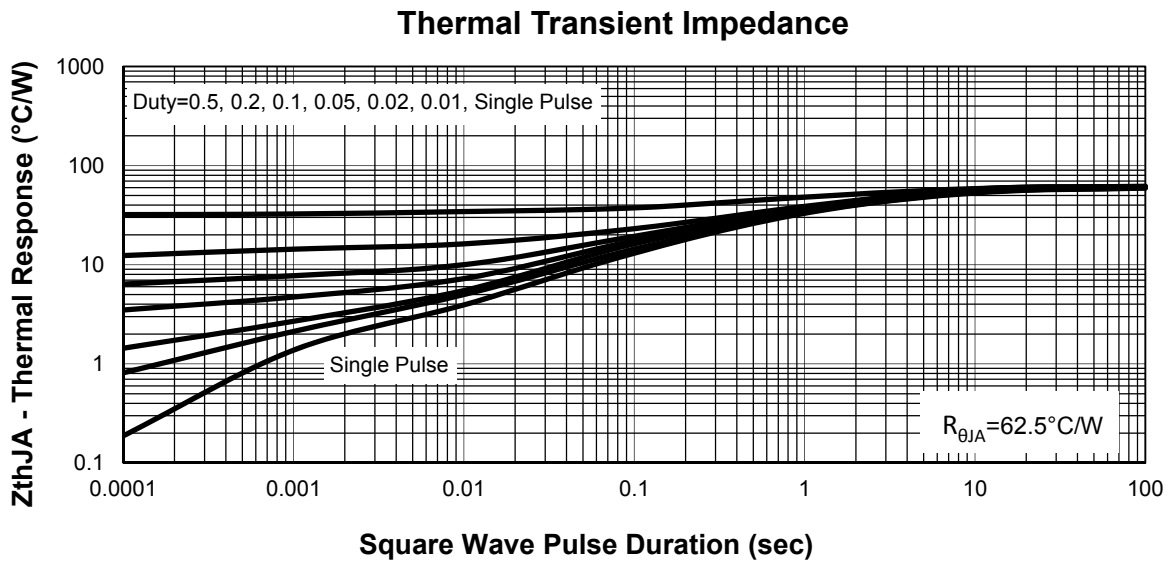
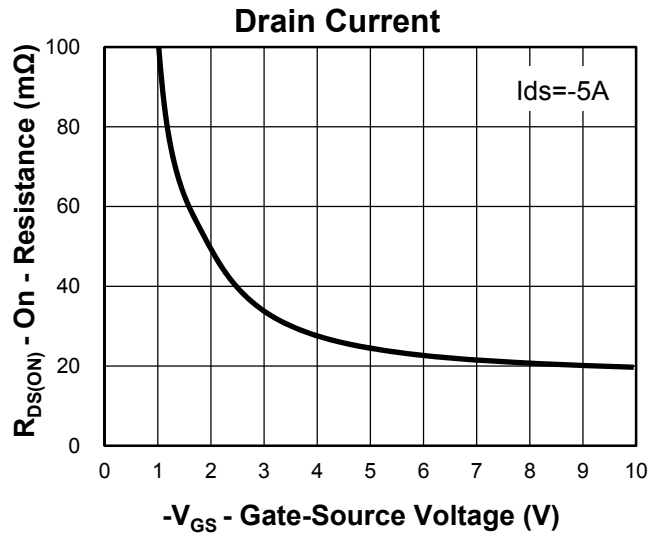
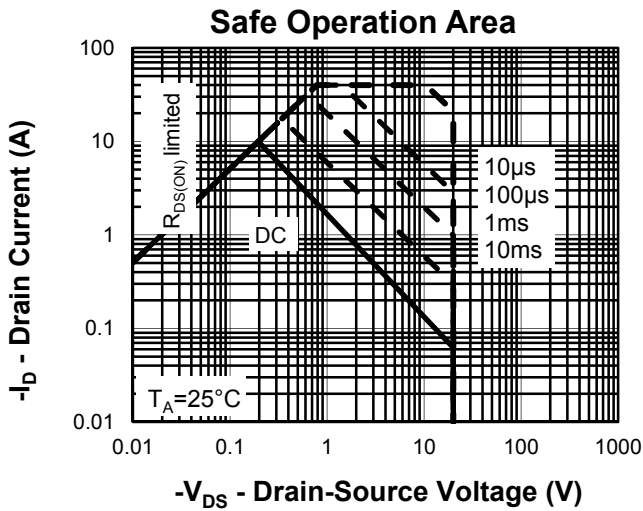
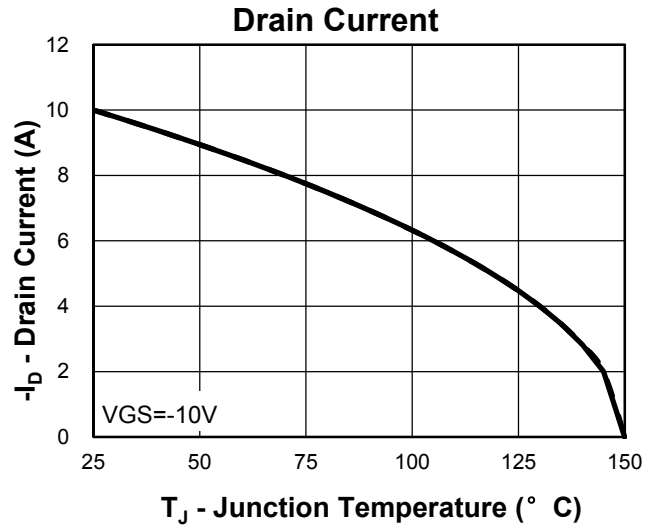
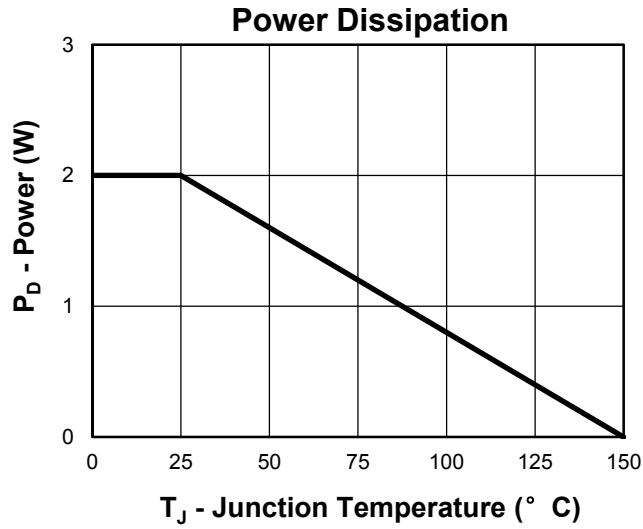
**Thermal Transient Impedance**



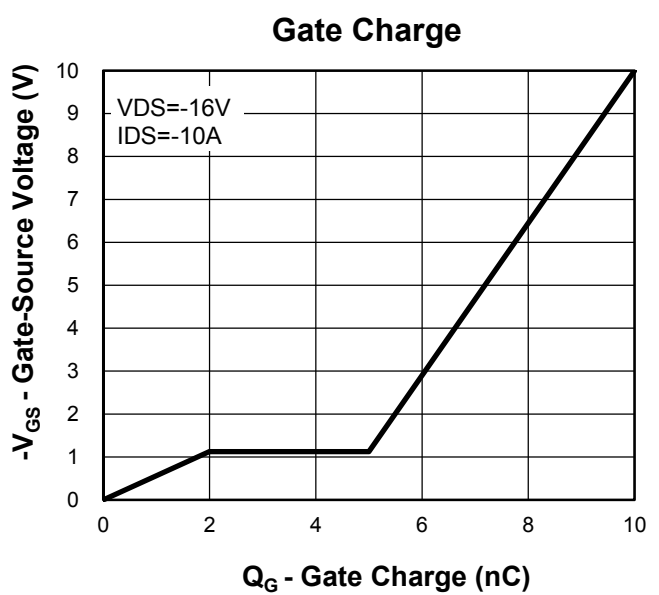
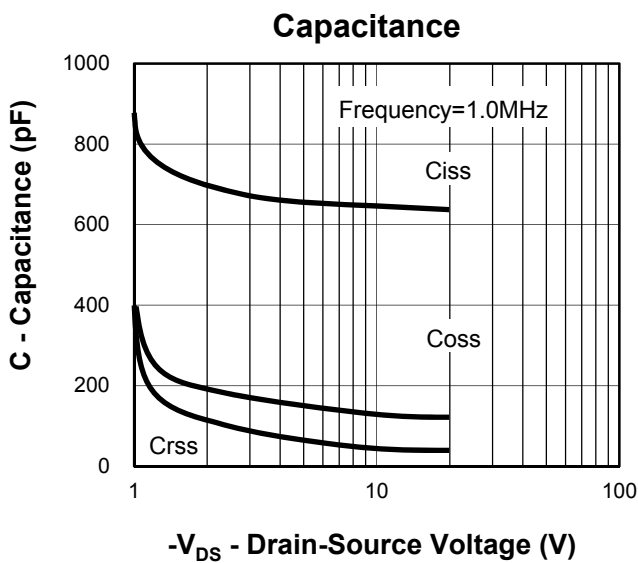
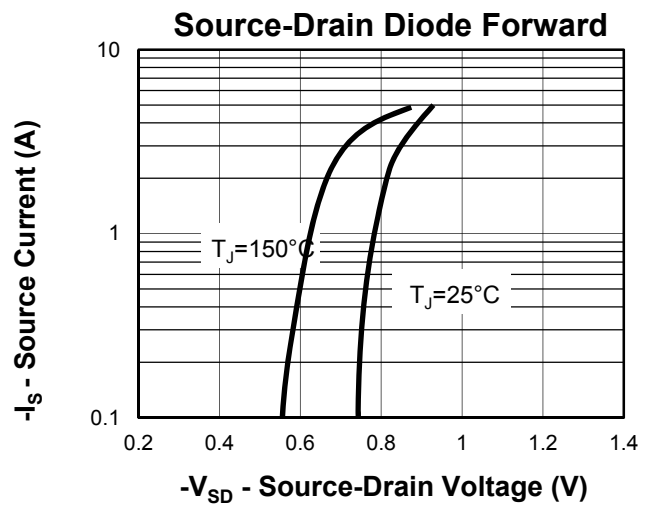
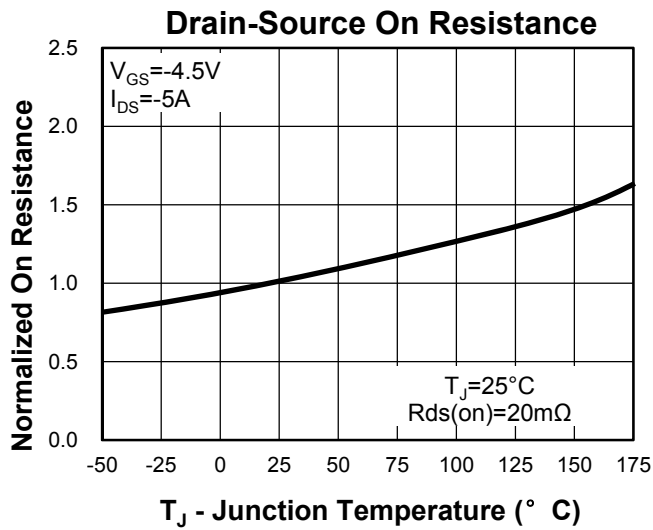
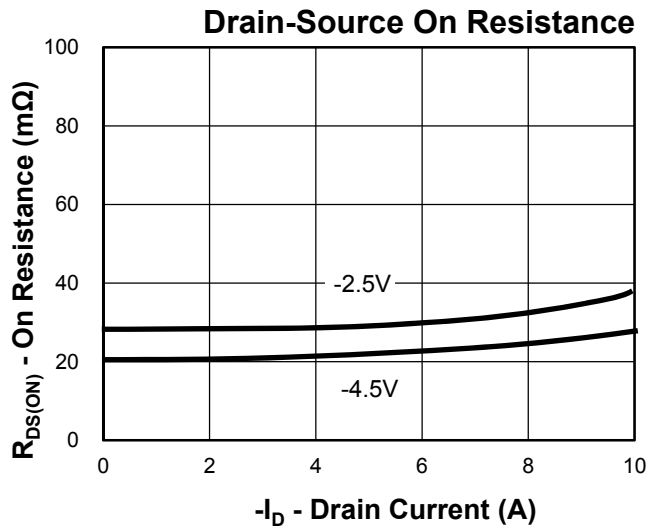
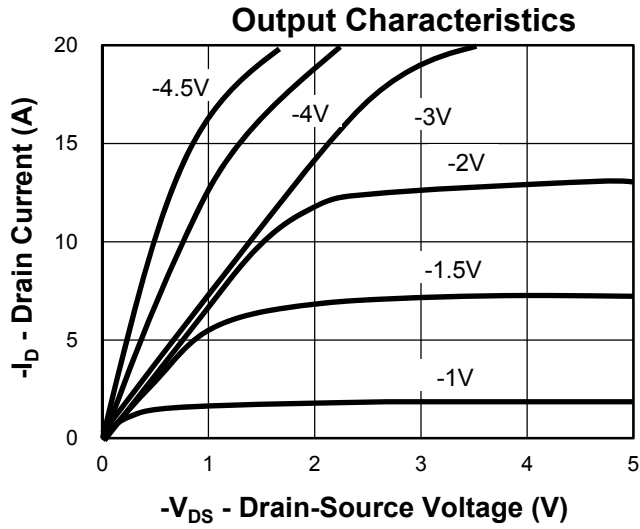
**Typical Characteristics(N-Channel)**



**Typical Characteristics(P-Channel)**



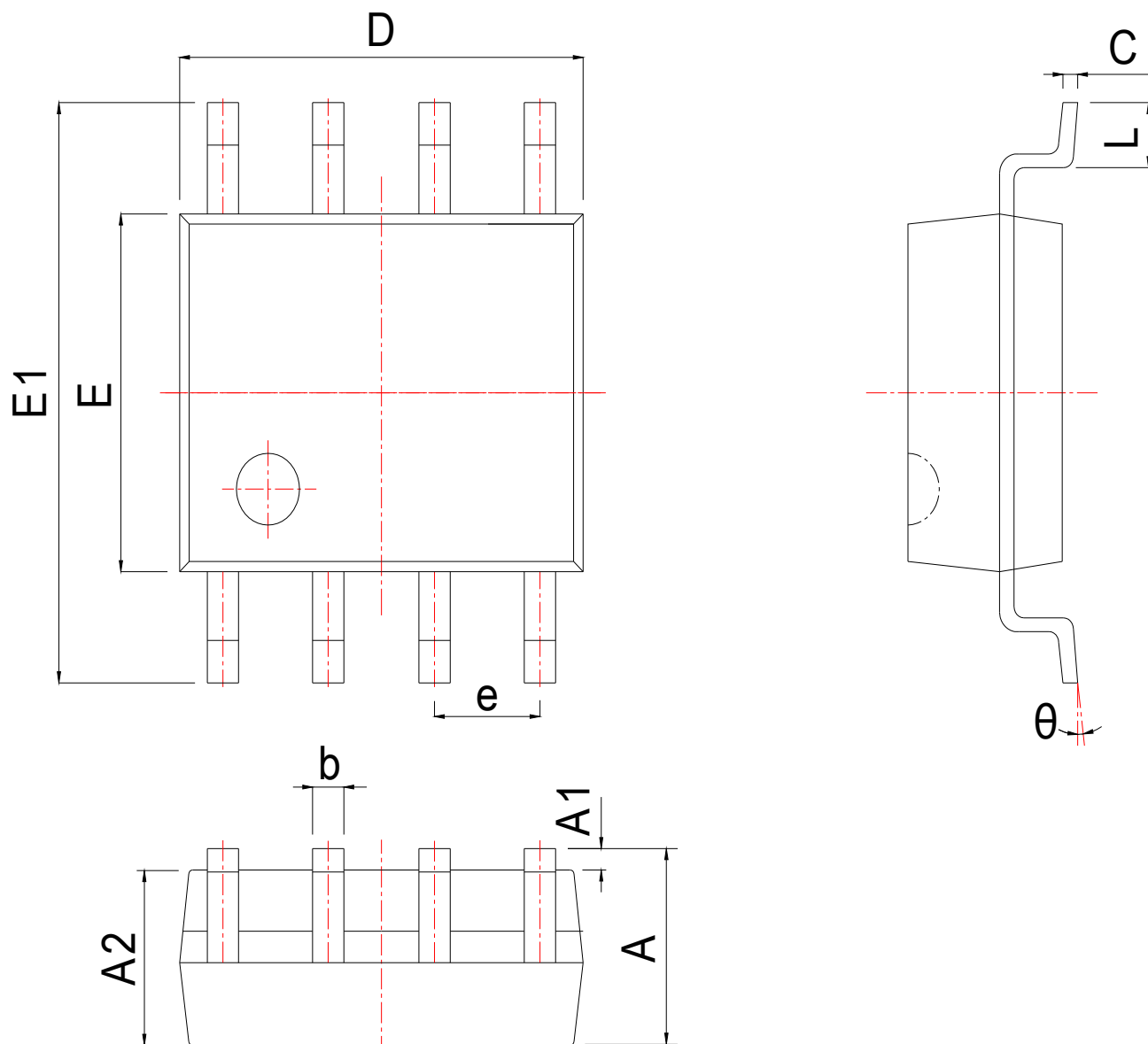
**Typical Characteristics(P-Channel)**





**Package Information**

**SOP-8**



SYMBOL	MM			INCH		
	MIN	NOM	MAX	MIN	NOM	MAX
A	1.300	1.525	1.750	0.051	0.060	0.069
A1	0.050	0.150	0.250	0.002	0.006	0.010
A2	1.350	1.450	1.550	0.053	0.057	0.061
b	0.330	0.420	0.510	0.013	0.017	0.020
c	0.170	0.210	0.250	0.007	0.008	0.010
D	4.700	4.900	5.100	0.185	0.193	0.201
E	3.800	3.900	4.000	0.150	0.154	0.157
E1	5.800	6.000	6.200	0.228	0.236	0.244
e	1.270 BSC			0.050 BSC		
L	0.400	0.835	1.270	0.016	0.033	0.050
$\theta$	0°		8°	0°		8°

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