



#### Product Summary

$V_{(BR)DSS}$	$R_{DS(on)TYP}$	$I_D$
40V	7.0mΩ@10V	25A
	9.0mΩ@4.5V	

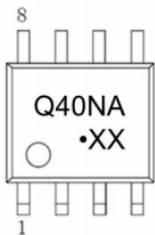
#### Feature

- High density cell design for ultra low  $R_{DS(ON)}$
- Excellent package for good heat dissipation

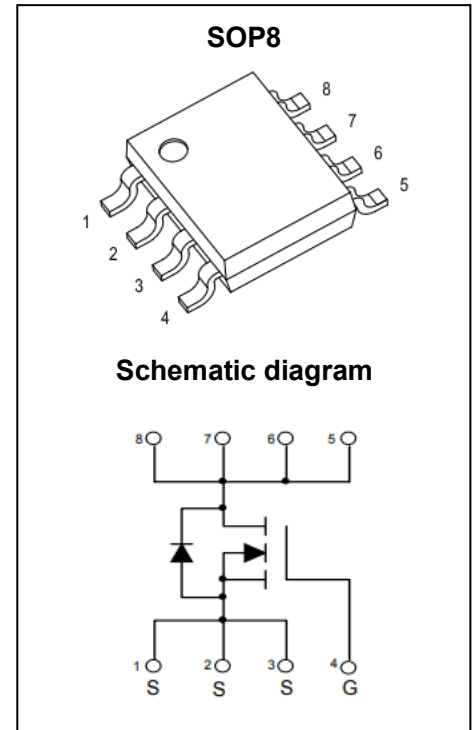
#### Application

- Power switching application
- Hard switched and high frequency circuits
- Uninterruptible power supply

#### MARKING:



Q40NA = Device Code  
XX = Date Code



#### ABSOLUTE MAXIMUM RATINGS ( $T_A = 25^\circ\text{C}$ unless otherwise noted)

Parameter	Symbol	Value	Unit	
Drain-Source Voltage	$V_{DS}$	40	V	
Gate-Source Voltage	$V_{GS}$	±20	V	
Continuous Drain Current	$I_D$	$T_c = 25^\circ\text{C}$	25	A
		$T_c = 100^\circ\text{C}$	17.5	A
Pulsed Drain Current	$I_{DM}$	110	A	
Single Pulsed Avalanche Energy	$E_{AS}^*$	100	mJ	
Power Dissipation	$P_D$	3.1	W	
Thermal Resistance from Junction to Ambient <sup>1</sup>	$R_{\theta JA}$	41	$^\circ\text{C}/\text{W}$	
Junction Temperature	$T_J$	150	$^\circ\text{C}$	
Storage Temperature	$T_{STG}$	-55~ +150	$^\circ\text{C}$	

\* $E_{AS}$  Test Condition  $V_{DD} = 25\text{V}$ ,  $V_{GS} = 10\text{V}$ ,  $L = 0.5\text{mH}$ ,  $I_{AS} = 20\text{A}$  Starting  $T_J = 25^\circ\text{C}$ .

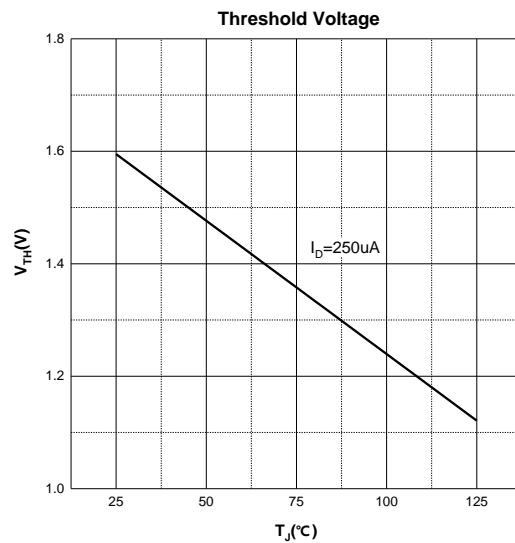
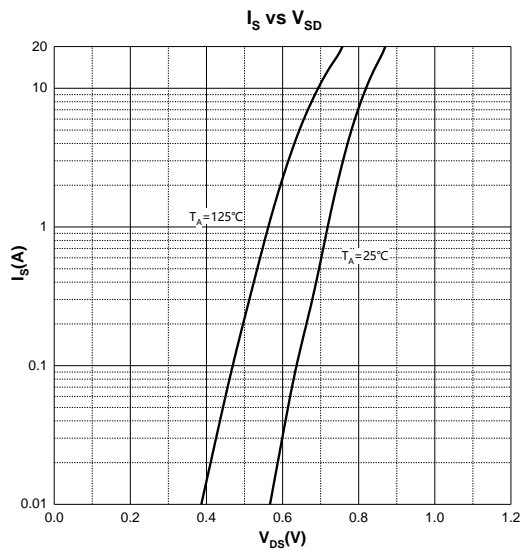
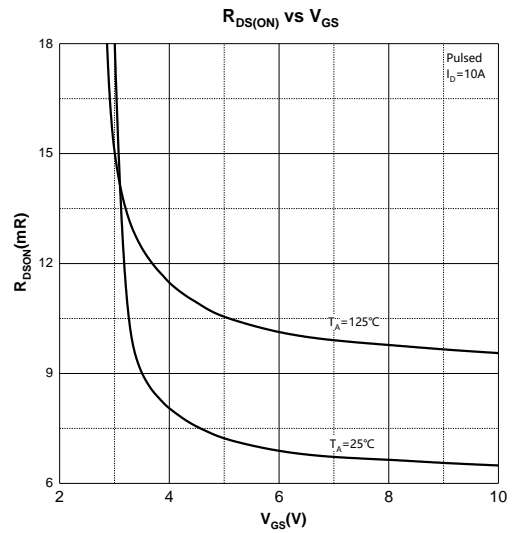
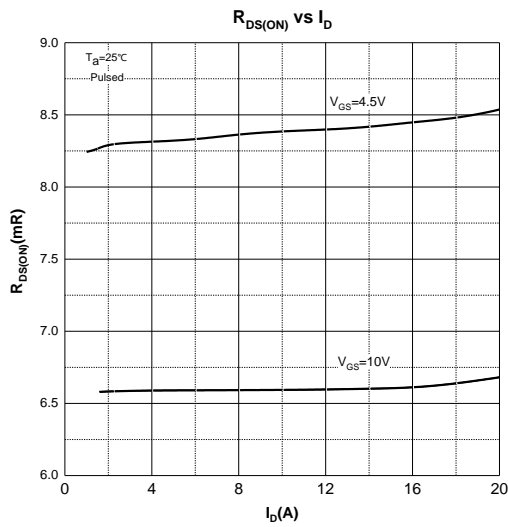
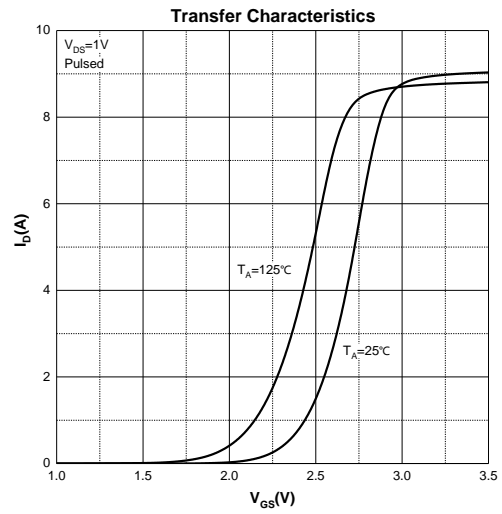
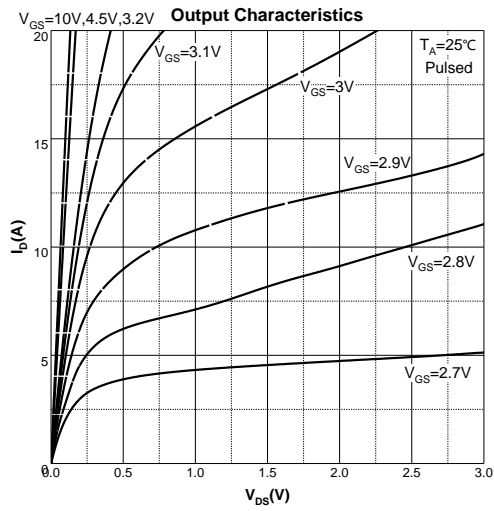
## MOSFET ELECTRICAL CHARACTERISTICS ( $T_A = 25^\circ\text{C}$ unless otherwise noted)

Parameter	Symbol	Test Condition	Min	Type	Max	Unit
<b>Off Characteristics</b>						
Drain-source breakdown voltage	$V_{(BR)DSS}$	$V_{GS} = 0V, I_D = 250\mu A$	40			V
Zero gate voltage drain current	$I_{DSS}$	$V_{DS} = 40V, V_{GS} = 0V$			1	$\mu A$
Gate-body leakage current	$I_{GSS}$	$V_{GS} = \pm 20V, V_{DS} = 0V$			$\pm 100$	nA
<b>On Characteristics</b>						
Gate threshold voltage	$V_{GS(th)}$	$V_{DS} = V_{GS}, I_D = 250\mu A$	1	1.5	2.5	V
Drainsource onresistance	$R_{DS(on)}$	$V_{GS} = 10V, I_D = 10A$		7	9	m $\Omega$
		$V_{GS} = 4.5V, I_D = 10A$		9	13.5	
Forward transconductance	$g_{FS}$	$V_{DS} = 10V, I_D = 10A$		13		S
<b>Dynamic Characteristics</b>						
Input Capacitance	$C_{iss}$	$V_{DS} = 20V, V_{GS} = 0V, f = 1MHz$		2775		pF
Output Capacitance	$C_{oss}$			195		
Reverse Transfer Capacitance	$C_{rss}$			165		
Gate resistance	$R_g$	$V_{DS} = 0V, V_{GS} = 0V, f = 1MHz$		1.72		$\Omega$
<b>Switching Characteristics</b>						
Total Gate Charge	$Q_g$	$V_{DS} = 20V, V_{GS} = 10V, I_D = 10A$		20		nC
GateSource Charge	$Q_{gs}$			3.5		
GateDrain Charge	$Q_{gd}$			5		
Turnon delay time	$t_{d(on)}$	$V_{DD} = 15V, R_G = 3\Omega, V_{GS} = 10V, R_L = 3\Omega$		12		ns
Turnon rise time	$t_r$			3		
Turnoff delay time	$t_{d(off)}$			50		
Turnoff fall time	$t_f$			5		
<b>Diode Characteristics</b>						
Diode Forward Voltage	$V_{SD}$	$V_{GS} = 0V, I_S = 10A$			1.2	V

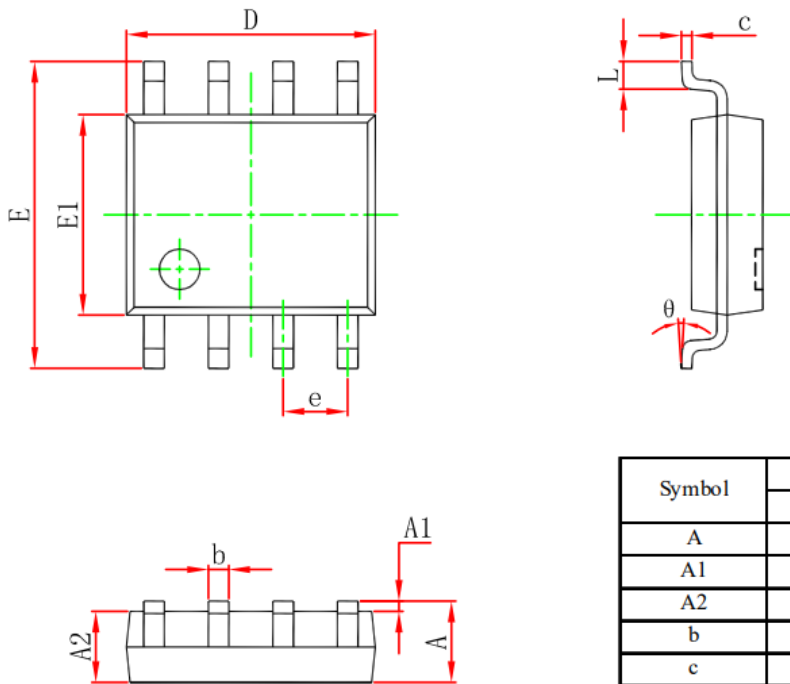
Notes :

1.  $R_{\theta JA}$  is measured with the device mounted on 1 in<sup>2</sup> FR4 board with 1oz. single side copper, in a still air environment with  $T_A = 25^\circ\text{C}$ .

**Typical Characteristics**



## SOP8 Package Information



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	1.350	1.750	0.053	0.069
A1	0.100	0.250	0.004	0.010
A2	1.350	1.550	0.053	0.061
b	0.330	0.510	0.013	0.020
c	0.170	0.250	0.007	0.010
D	4.800	5.000	0.189	0.197
e	1.270 (BSC)		0.050 (BSC)	
E	5.800	6.200	0.228	0.244
E1	3.800	4.000	0.150	0.157
L	0.400	1.270	0.016	0.050
θ	0°	8°	0°	8°