

## Product Summary

$V_{(BR)DSS}$	$R_{DS(on)TYP}$	$I_D$
40V	8.5mΩ@10V	12A
	11mΩ@4.5V	

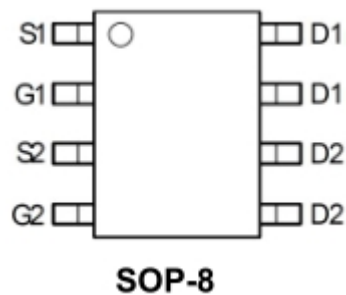
## Feature

- $V_{DS} = 40V, I_D = 12A$
- $R_{DS(ON)} < 12m\Omega @ V_{GS} = 10V$  (Typ. 8.4 mΩ)  
 $R_{DS(ON)} < 18m\Omega @ V_{GS} = 4.5V$  (Typ. 12.3 mΩ)
- High density cell design for ultra low Rdson
- Fully characterized avalanche voltage and current
- Good stability and uniformity with high EAS
- Excellent package for good heat dissipation
- Special process technology for high ESD capability

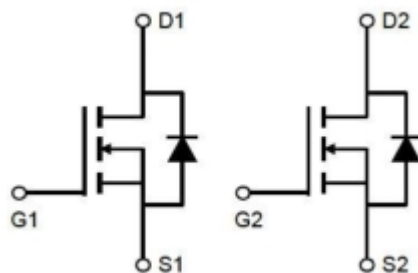
## Application

- Load switching
- Hard switched and high frequency circuits
- Uninterruptible power supply

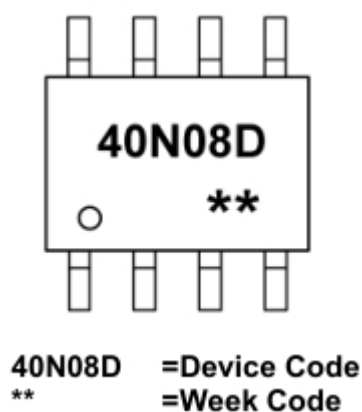
## Package



## Circuit diagram



## Marking



## 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	$V_{GS}$	$\pm 20$	V
Drain Current-Continuous	$I_D$	12	A
Drain Current-Continuous( $T_c=100^{\circ}\text{C}$ )	$I_{D(100^{\circ}\text{C})}$	8.5	
Pulsed Drain Current	$I_{DM}$	60	A
Maximum Power Dissipation	$P_D$	1.5	W
Thermal Resistance,Junction-to-Ambient <sup>(1)</sup>	$R_{\theta JA}$	85	$^{\circ}\text{C}/\text{W}$
Operating Junction and Storage Temperature Range	$T_J, T_{STG}$	-55 to 175	$^{\circ}\text{C}$

## Electrical characteristics

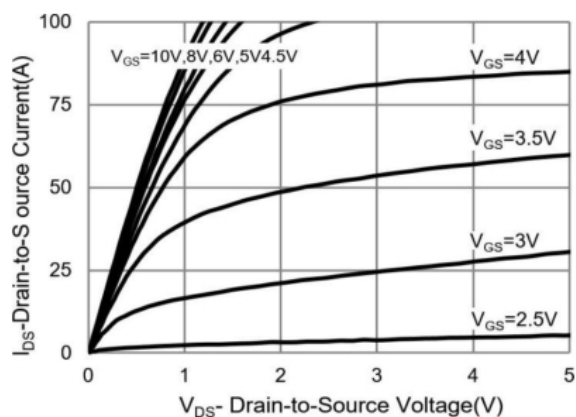
( $T_A=25^{\circ}\text{C}$ , unless otherwise noted)

Parameter	Symbol	Test Condition	Min.	Typ.	Max.	Unit
Off Characteristics						
Drain-Source Breakdown Voltage	BV (BR)DSS	V <sub>GS</sub> = 0V, I <sub>D</sub> =250μA	40	45		V
Zero Gate Voltage Drain Current	I <sub>DSS</sub>	V <sub>DS</sub> =40V,V <sub>GS</sub> = 0V			1	uA
Gate-Body Leakage Current	I <sub>GSS</sub>	V <sub>GS</sub> = ±20V , V <sub>DS</sub> =0V			±100	uA
Gate Threshold Voltage	V <sub>GS(th)</sub>	V <sub>DS</sub> =V <sub>GS</sub> , I <sub>D</sub> =250μA	1.2	1.6	2.5	V
Drain-Source On-State Resistance	R <sub>DS(on)</sub>	V <sub>GS</sub> =10V, I <sub>D</sub> =10A		8.5	11	mΩ
		V <sub>GS</sub> =4.5V, I <sub>D</sub> =8A		11	15	
Forward Transconductance	g <sub>FS</sub>	V <sub>DS</sub> =5V,I <sub>D</sub> =10A		75		S
Dynamic Characteristics <sup>(3)</sup>						
Input Capacitance	C <sub>iss</sub>	V <sub>DS</sub> =20V, V <sub>GS</sub> =0V, f=1MHz		1780		pF
Output Capacitance	C <sub>Oss</sub>			209		
Reverse Transfer Capacitance	C <sub>rss</sub>			160		
Switching Characteristics <sup>(3)</sup>						
Turn-On Delay Time	T <sub>d(on)</sub>	V <sub>DS</sub> =20V, R <sub>L</sub> =2Ω, V <sub>GS</sub> =10V, R <sub>G</sub> =3Ω		6.4		nS
Rise Time	T <sub>r</sub>			17.2		
Turn-Off Delay Time	T <sub>d(off)</sub>			29.6		
Fall Time	T <sub>f</sub>			16.8		
Total Gate Charge	Q <sub>g</sub>	V <sub>DS</sub> =20V, I <sub>D</sub> =10A, V <sub>GS</sub> =10V		30		pF
Gate-Source Charge	Q <sub>gs</sub>			4.2		
Gate-Drain Charge	Q <sub>gd</sub>			9.5		
Diode Characteristics						
Diode Forward Voltage <sup>(2)</sup>	V <sub>SD</sub>	V <sub>GS</sub> =0V,I <sub>S</sub> =10A			1.2	V
Diode Forward Current <sup>(1)</sup>	I <sub>S</sub>				12	A
Reverse Recovery Time	t <sub>rr</sub>	T <sub>J</sub> = 25°C, I <sub>F</sub> = 10A		29		nS
Reverse Recovery Charge	Q <sub>rr</sub>	di/dt = 100A/μs <sup>(2)</sup>		26		nC

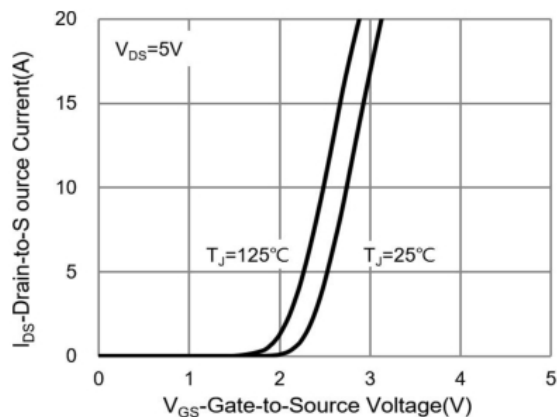
### Notes:

1. Repetitive Rating: Pulse width limited by maximum junction temperature.
2. Surface Mounted on FR4 Board,  $t \leq 10$  sec.
3. Pulse Test: Pulse Width  $\leq 300\mu s$ , Duty Cycle  $\leq 2\%$ .
4. Guaranteed by design, not subject to production

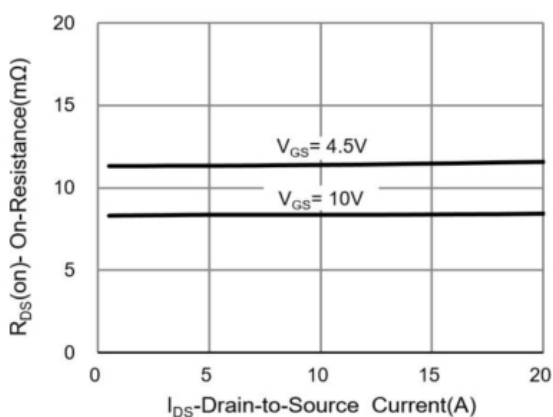
## Typical Characteristics



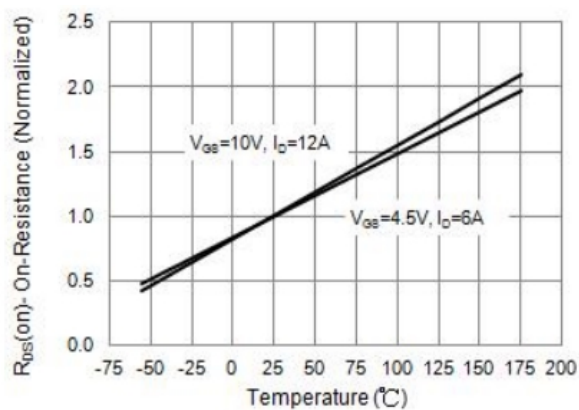
On-Region Characteristics



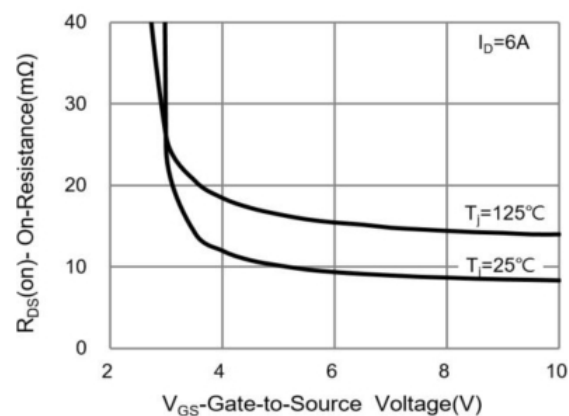
Transfer Characteristics



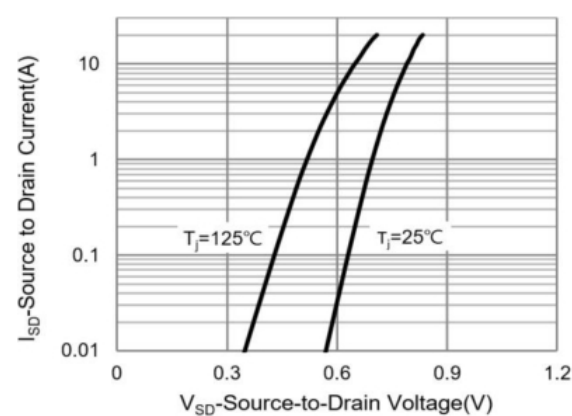
On-Resistance vs. Drain Current



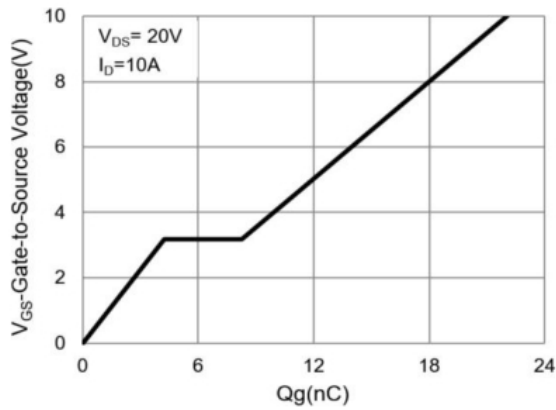
On-Resistance vs. Junction temperature



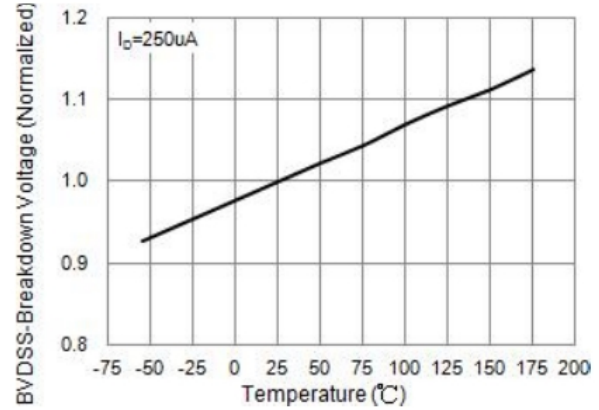
On-Resistance Variation with  $V_{GS}$



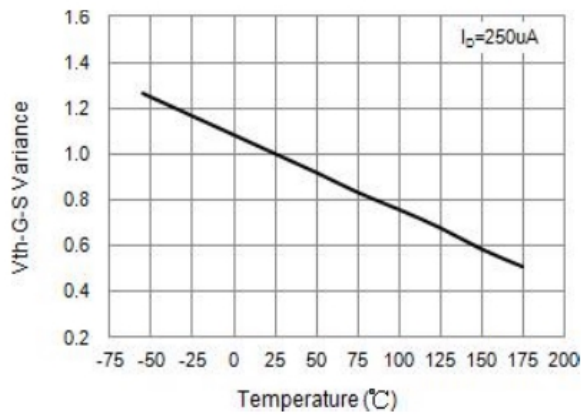
Body Diode Characteristics



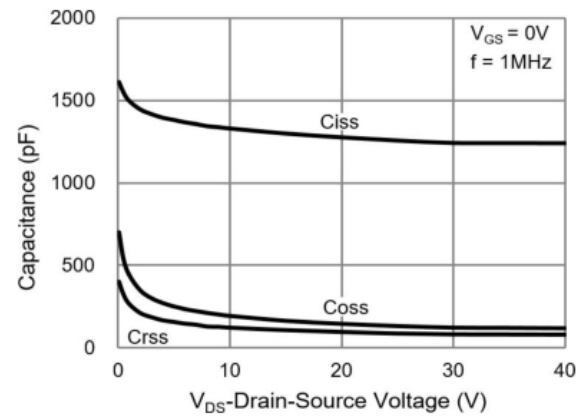
Gate-Charge Characteristics



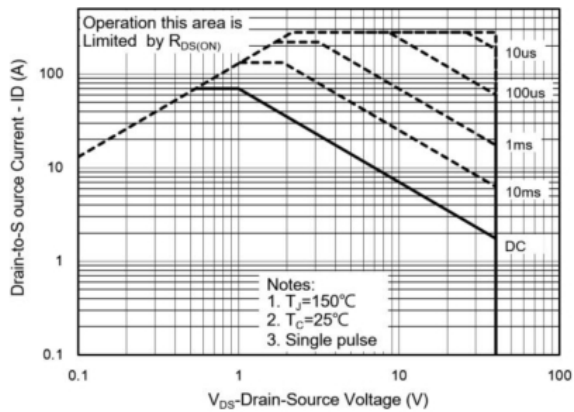
Breakdown Voltage Variation vs. Temperature



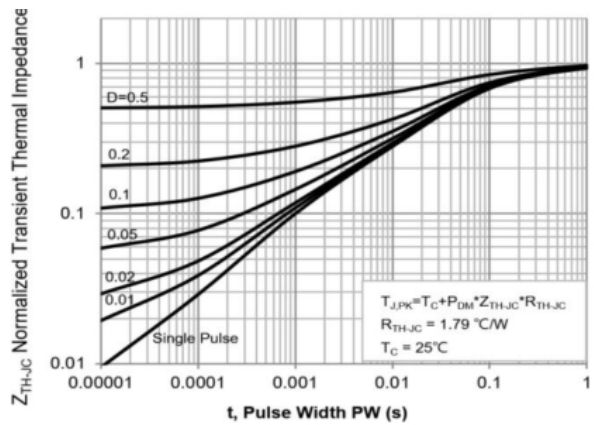
Threshold Voltage Variation with Temperature



Capacitance vs. Drain-Source Voltage

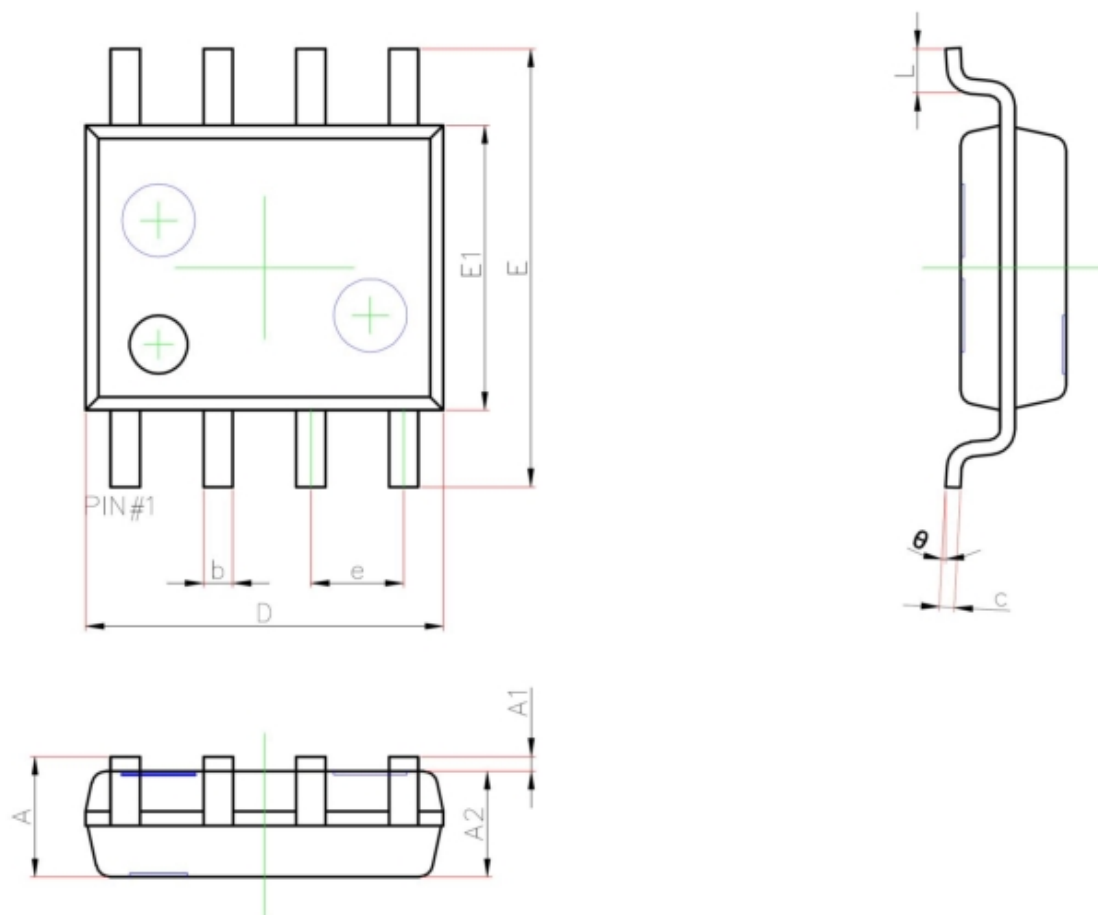


Maximum Safe Operating Area



Normalized Transient Thermal Impedance

## SOP-8 Package Information



Symbol	Dimensions In Millimeters	
	Min.	Max.
A	1.35	1.75
A1	0.10	0.25
A2	1.35	1.55
b	0.33	0.51
c	0.17	0.25
D	4.80	5.00
e	1.27 REF.	
E	5.80	6.20
E1	3.80	4.00
L	0.40	1.27
$\theta$	0°	8°