

### Product Summary

$V_{(BR)DSS}$	$R_{DS(on)MAX}$	$I_D$	$V_{(BR)DSS}$	$R_{DS(on)MAX}$	$I_D$
100V	110mΩ@10V	5A	-100V	290mΩ@-10V	-2.5A
	120mΩ@4.5V			320mΩ@-4.5V	

### Feature

- Trenchfet Power MOSFET
- Excellent  $R_{DS(on)}$  and Low Gate Charge
- Fast Switching Speed

### Application

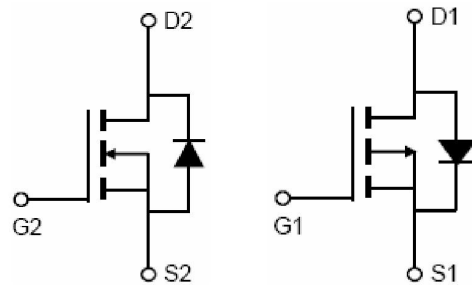
- Motor Control
- DC/DC Converters
- Power Management

### Package

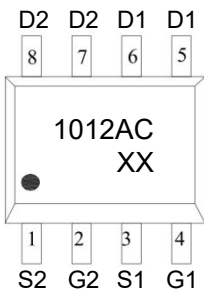


SOP-8

### Circuit diagram



### Marking



### Absolute maximum ratings (Ta=25°C unless otherwise noted)

Parameter	Symbol	N-Channel	p-Channel	Unit
Drain-Source Voltage	$V_{DS}$	100	-100	V
Gate-Source Voltage	$V_{GS}$	$\pm 20$	$\pm 20$	V
Continuous Drain Current	$I_D$	5	-2.5	A
Power Dissipation	$P_D$	1.8	1.8	W
Thermal Resistance, Junction-to-Ambient	$R_{\theta JA}$	69.5	69.5	$^{\circ}C/W$
Junction Temperature	$T_J$	150	150	$^{\circ}C$
Storage Temperature	$T_{STG}$	-55 ~ +150	-55 ~ +150	$^{\circ}C$

### N-CH Electrical characteristics (T<sub>A</sub>=25°C unless otherwise noted)

Parameter	Symbol	Test Condition	Min	Typ	Max	Unit
<b>Static Characteristics</b>						
Drain-source breakdown voltage	$V_{(BR)DSS}$	$V_{GS}=0V, I_D=250\mu A$	100			V
Zero gate voltage drain current	$I_{DSS}$	$V_{DS}=80V, V_{GS}=0V$			1	$\mu A$
Gate-body leakage current	$I_{GSS}$	$V_{GS}=\pm 20V, V_{DS}=0V$			$\pm 100$	nA
Gate threshold voltage	$V_{GS(th)}$	$V_{DS}=V_{GS}, I_D=250\mu A$	1.0	1.8	2.5	V
Drain-source on-resistance	$R_{DS(on)}$	$V_{GS}=10V, I_D=2A$		90	110	m $\Omega$
		$V_{GS}=4.5V, I_D=1A$		100	120	m $\Omega$
<b>Dynamic characteristics<sup>1)</sup></b>						
Input Capacitance	$C_{iss}$	$V_{DS}=15V, V_{GS}=0V, f=1MHz$		1535		pF
Output Capacitance	$C_{oss}$			60		
Reverse Transfer Capacitance	$C_{rss}$			37		
Total Gate Charge	$Q_g$	$V_{DS}=80V, V_{GS}=10V, I_D=2A$		26		nC
Gate-Source Charge	$Q_{gs}$			3.8		
Gate-Drain Charge	$Q_{gd}$			4.8		
Turn-on delay time	$t_{d(on)}$	$V_{DD}=50V, V_{GS}=10V$ $R_G=3.3\Omega, I_D=2A$		4.2		nS
Turn-on rise time	$t_r$			7.6		
Turn-off delay time	$t_{d(off)}$			41		
Turn-off fall time	$t_f$			14		
<b>Source-Drain Diode characteristics</b>						
Diode Forward voltage	$V_{SD}$	$V_{GS}=0V, I_S=1A, T_J=25^{\circ}C$			1.2	V

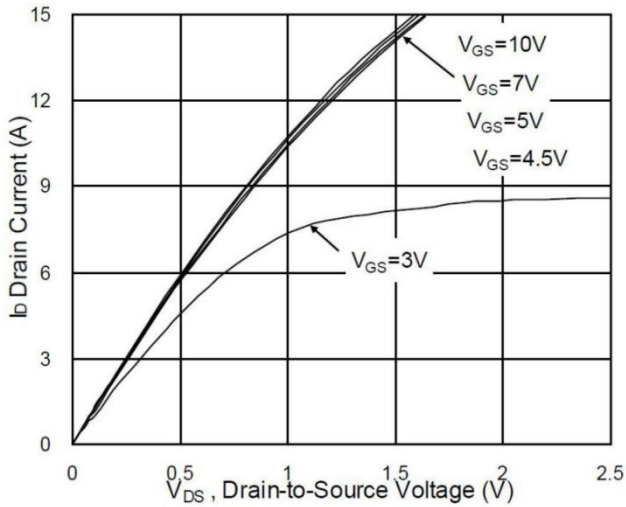
### P-CH Electrical characteristics (T<sub>A</sub>=25°C unless otherwise noted)

Parameter	Symbol	Test Condition	Min	Typ	Max	Unit
<b>Static Characteristics</b>						
Drain-source breakdown voltage	V <sub>(BR)DSS</sub>	V <sub>GS</sub> = 0V, I <sub>D</sub> = -250μA	-100			V
Zero gate voltage drain current	I <sub>DSS</sub>	V <sub>DS</sub> = -80V, V <sub>GS</sub> = 0V			-1	μA
Gate-body leakage current	I <sub>GSS</sub>	V <sub>GS</sub> = ±20V, V <sub>DS</sub> = 0V			±100	nA
Gate threshold voltage	V <sub>GS(th)</sub>	V <sub>DS</sub> = V <sub>GS</sub> , I <sub>D</sub> = -250μA	-1.0	-1.8	-2.5	V
Drain-source on-resistance	R <sub>DS(on)</sub>	V <sub>GS</sub> = -10V, I <sub>D</sub> = -2A		230	290	mΩ
		V <sub>GS</sub> = -4.5V, I <sub>D</sub> = -1A		240	320	mΩ
<b>Dynamic characteristics<sup>1)</sup></b>						
Input Capacitance	C <sub>iss</sub>	V <sub>DS</sub> = -15V, V <sub>GS</sub> = 0V, f = 1MHz		1239		pF
Output Capacitance	C <sub>oss</sub>			42		
Reverse Transfer Capacitance	C <sub>rss</sub>			38		
Total Gate Charge	Q <sub>g</sub>	V <sub>DS</sub> = -60V, V <sub>GS</sub> = -10V, I <sub>D</sub> = -2A		17.5		nC
Gate-Source Charge	Q <sub>gs</sub>			2.8		
Gate-Drain Charge	Q <sub>gd</sub>			3.2		
Turn-on delay time	t <sub>d(on)</sub>	V <sub>DD</sub> = -50V, V <sub>GS</sub> = -10V, I <sub>D</sub> = -2A, R <sub>GEN</sub> = 10Ω		9.1		nS
Turn-on rise time	t <sub>r</sub>			14.8		
Turn-off delay time	t <sub>d(off)</sub>			57		
Turn-off fall time	t <sub>f</sub>			34		
<b>Source-Drain Diode characteristics</b>						
Diode Forward voltage	V <sub>SD</sub>	V <sub>GS</sub> = 0V, I <sub>S</sub> = -1A			-1.2	V

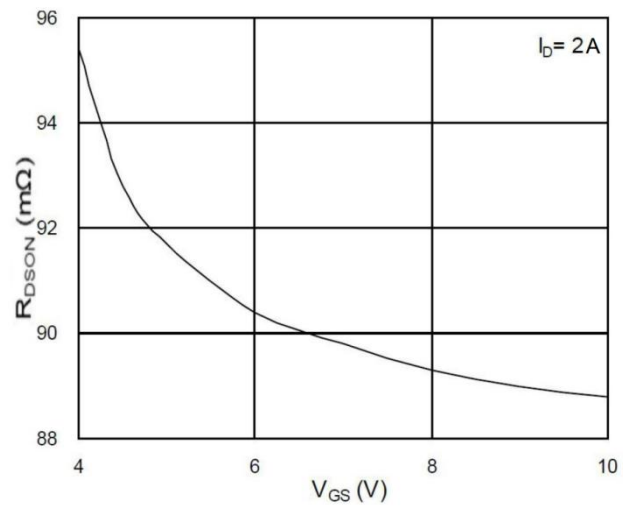
Notes:

1) Guaranteed by design, not subject to production.

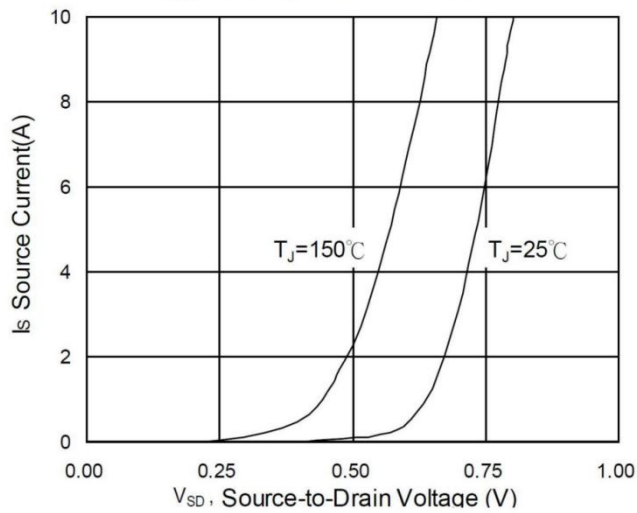
## N- Channel Typical Characteristics



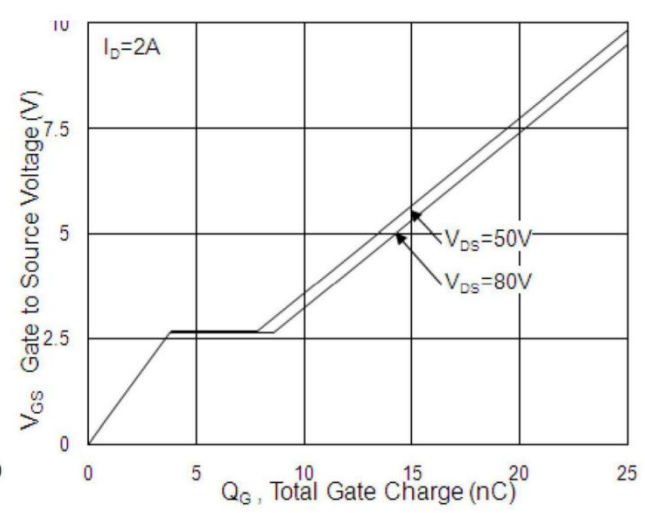
Typical Output Characteristics



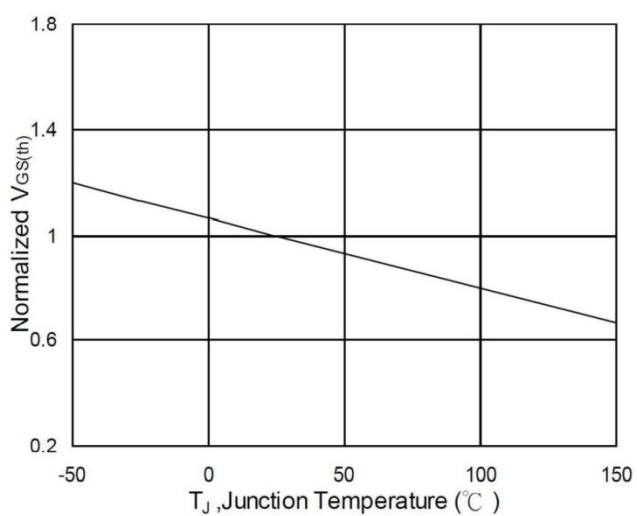
On-Resistance vs. Gate-Source



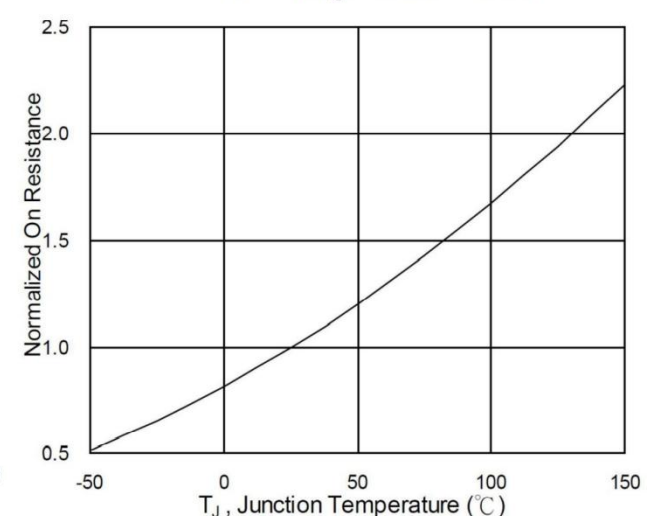
Forward Characteristics Of Reverse



Gate-Charge Characteristics

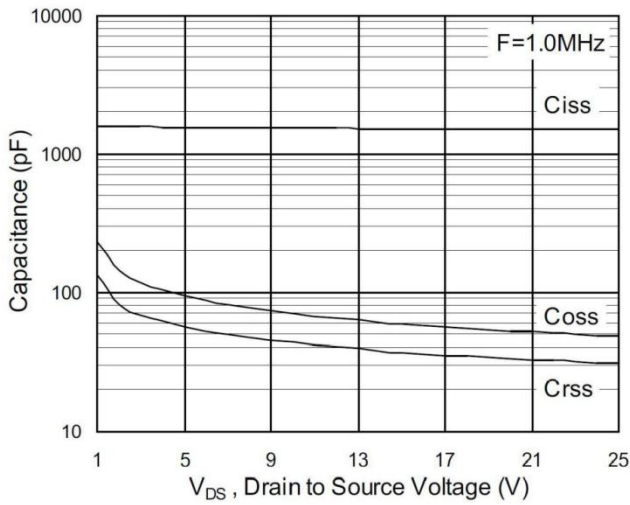


Normalized  $V_{GS(th)}$  vs.  $T_J$

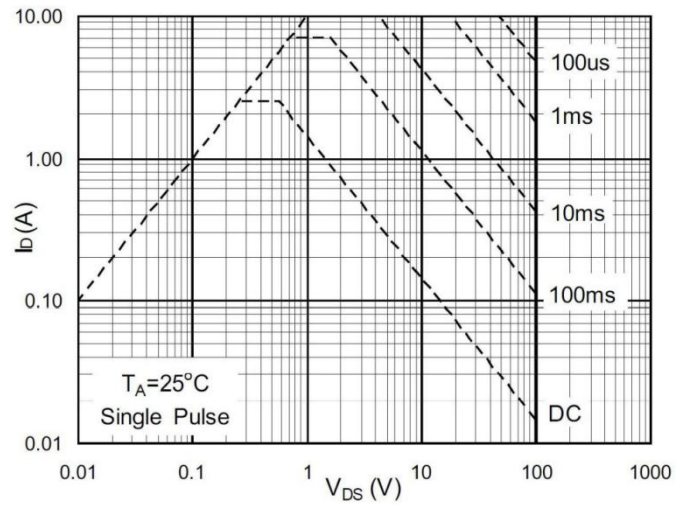


Normalized  $R_{DSON}$  vs.  $T_J$

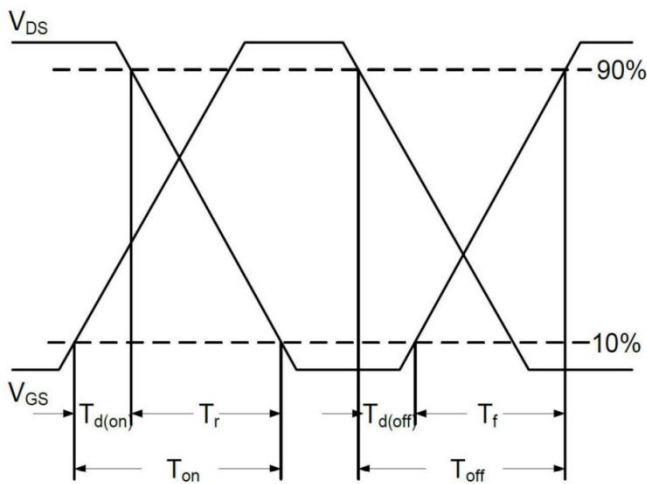
## N- Channel Typical Characteristics



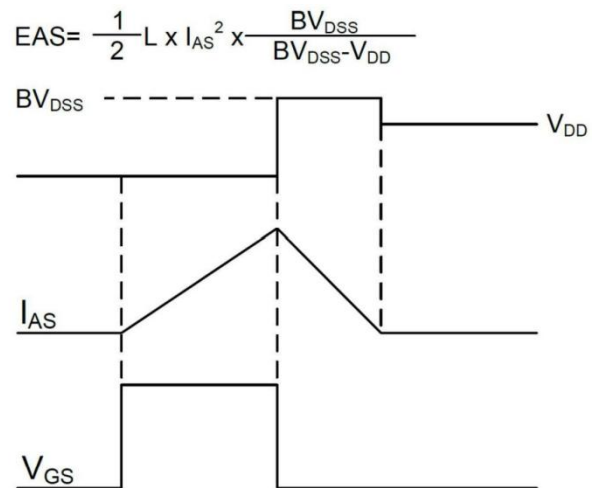
Capacitance



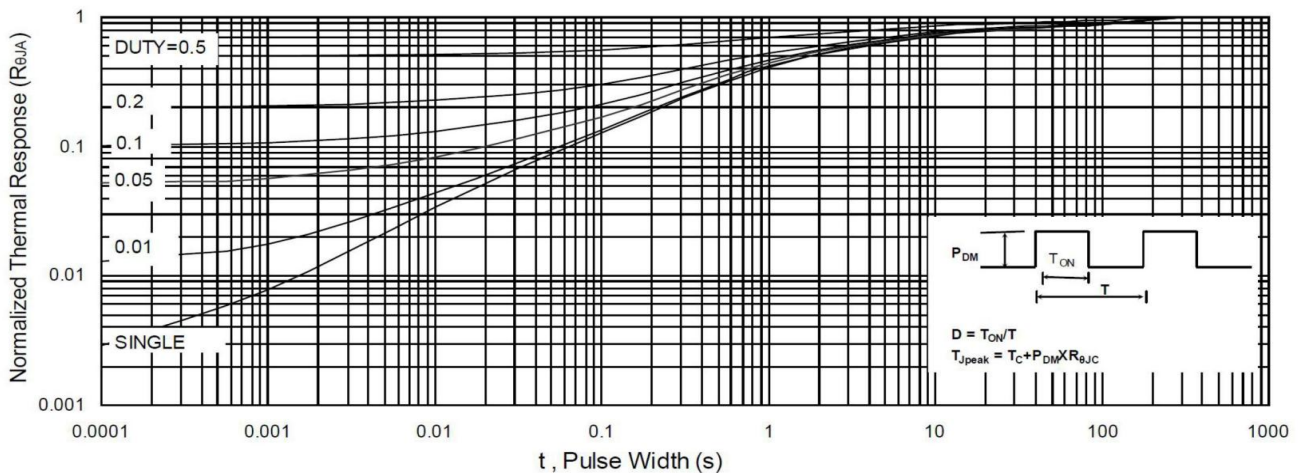
Safe Operating Area



Switching Time Waveform

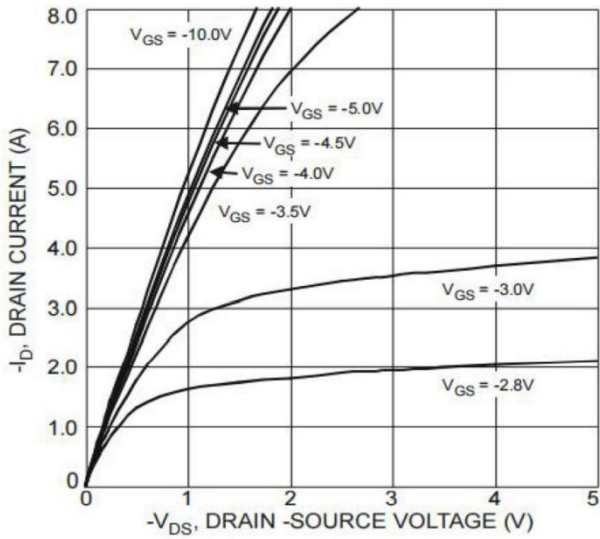


Unclamped Inductive Switching Waveform

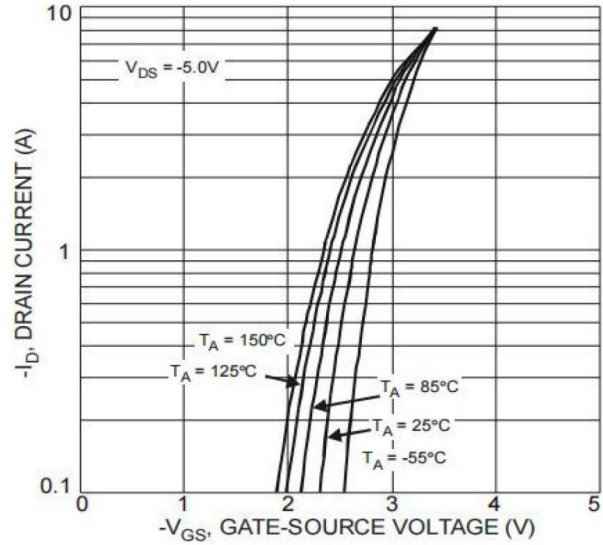


Normalized Maximum Transient Thermal Impedance

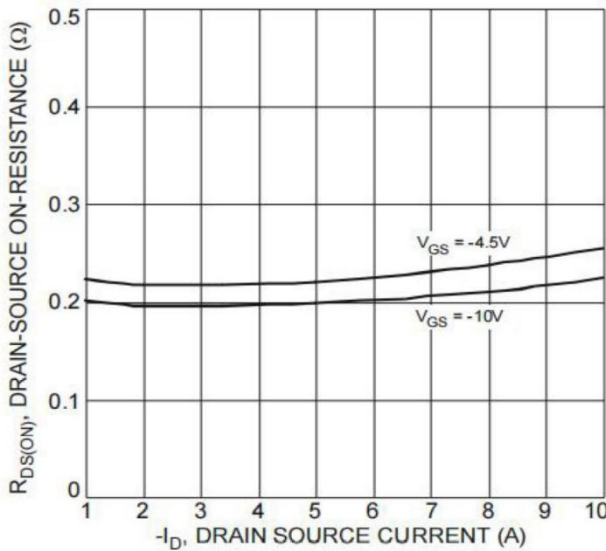
## P- Channel Typical Characteristics



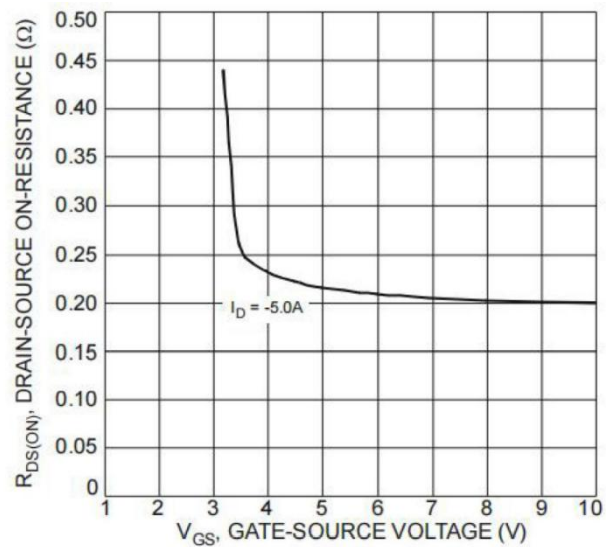
Typical Output Characteristics



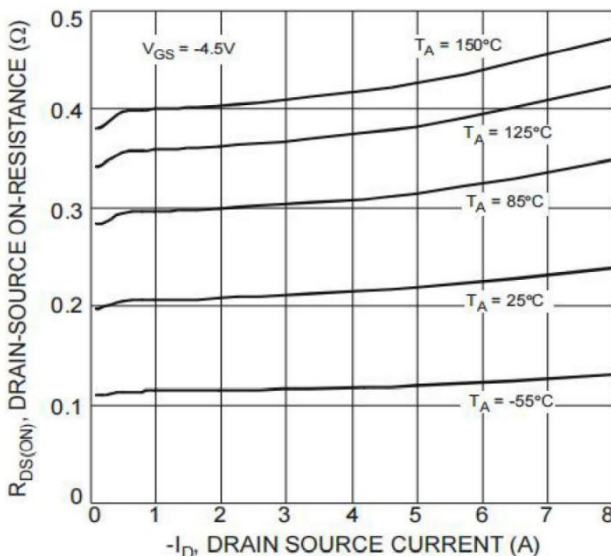
Transfer Characteristics



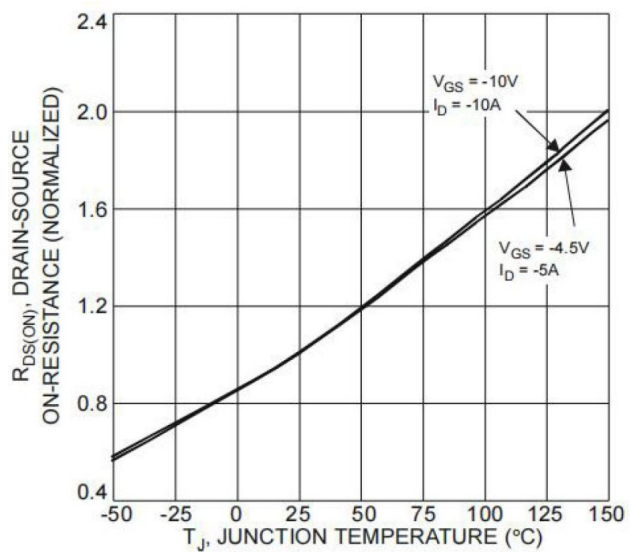
On-Resistance vs. Drain Current and Gate Voltage



Drain-Source On-Resistance vs. Gate-Source Voltage

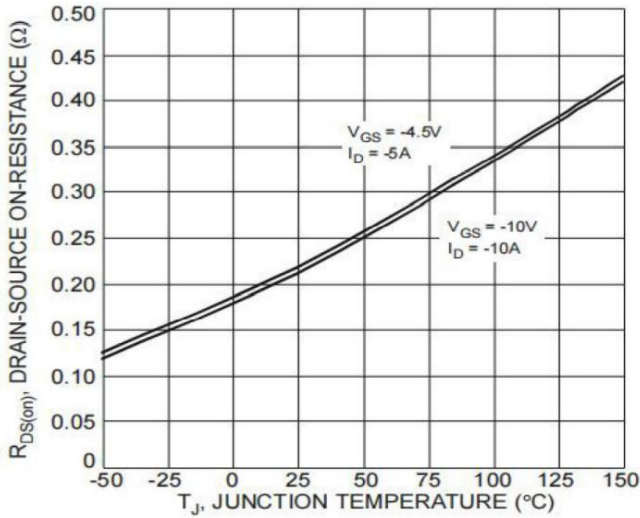


On-Resistance vs. Drain Current and Temperature

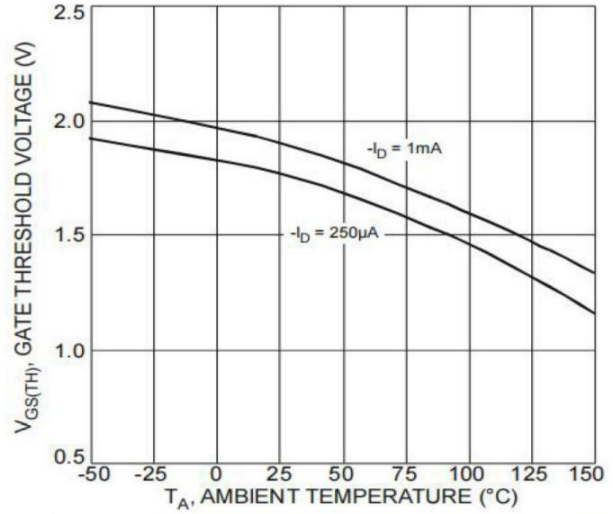


On-Resistance Variation with Temperature

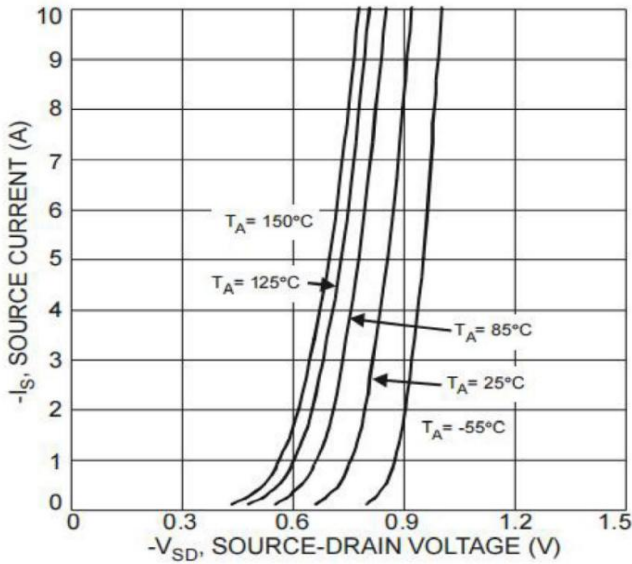
## P- Channel Typical Characteristics



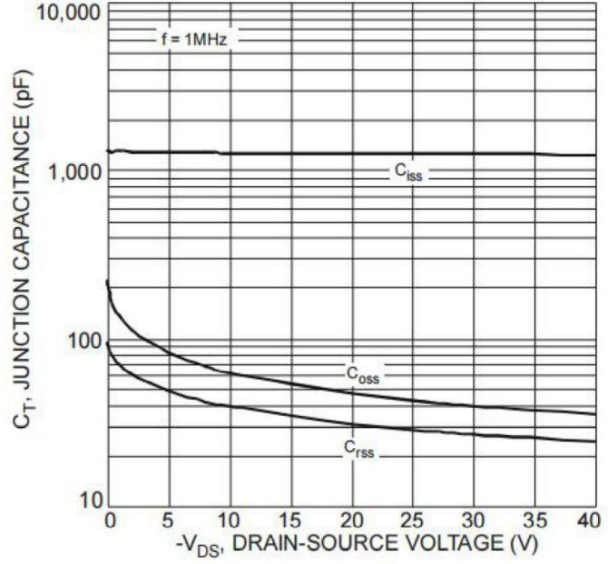
On-Resistance Variation with Temperature



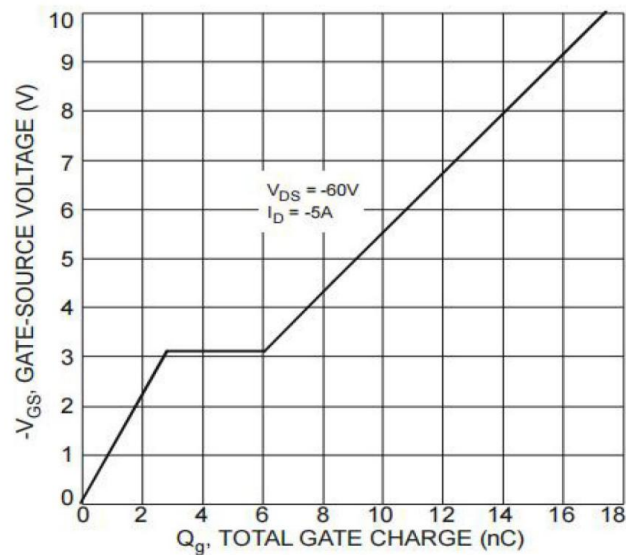
Gate Threshold Variation vs. Ambient Temperature



Diode Forward Voltage vs. Current

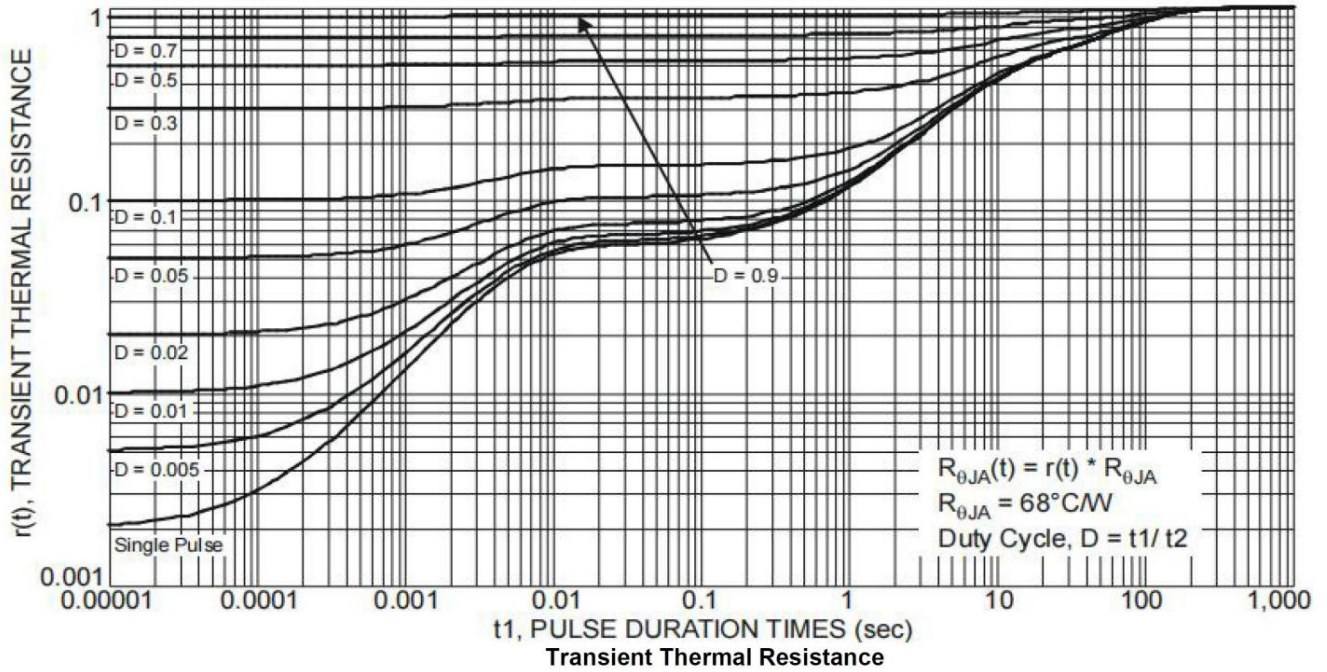


Typical Junction Capacitance



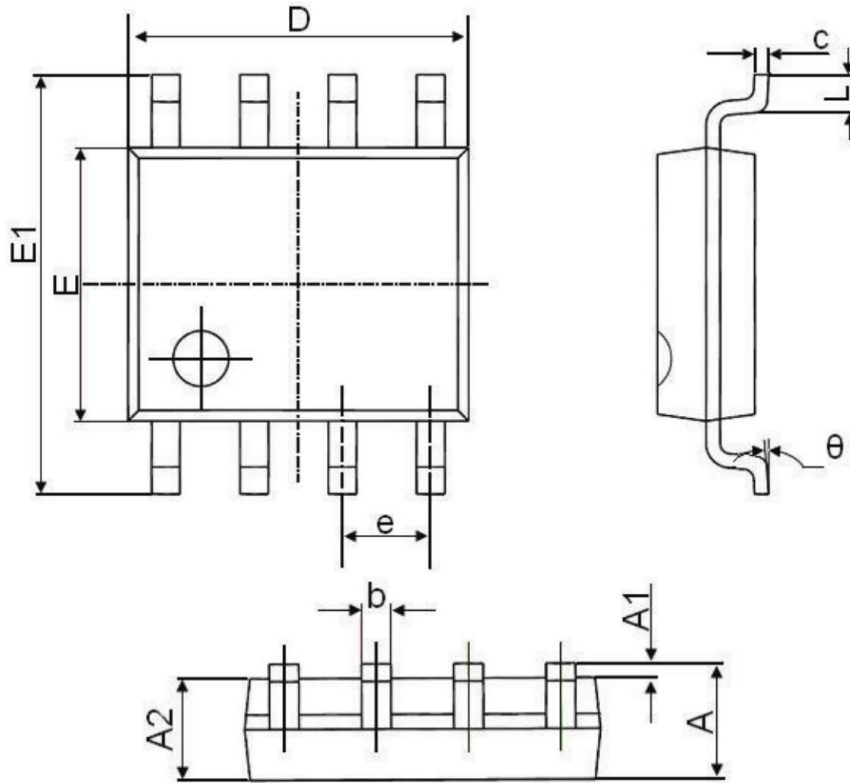
Gate-Charge Characteristics

## P- Channel Typical Characteristics





### SOP-8 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	1.250	1.650	0.049	0.065
b	0.330	0.510	0.013	0.020
c	0.170	0.250	0.006	0.010
D	4.700	5.100	0.185	0.200
E	3.800	4.000	0.150	0.157
E1	5.800	6.200	0.228	0.244
e	1.270(REF)		0.050(REF)	
L	0.400	1.270	0.016	0.050
θ	0°	8°	0°	8°