

N-Channel and P-Channel Enhancement Mode Power MOSFET

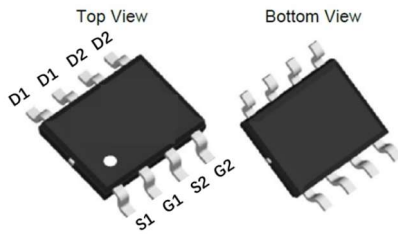
Features

- N-Channel: 40V, 8A
 $R_{DS(ON)} < 14 \text{ m}\Omega @ V_{GS} = 10\text{V}$
 $R_{DS(ON)} < 19 \text{ m}\Omega @ V_{GS} = 4.5\text{V}$
- P-Channel: -40V, -7A
 $R_{DS(ON)} < 29 \text{ m}\Omega @ V_{GS} = -10\text{V}$
 $R_{DS(ON)} < 34 \text{ m}\Omega @ V_{GS} = -4.5\text{V}$

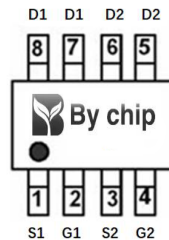
General Features

- Advanced Trench Technology
- Provide Excellent $R_{DS(ON)}$ and Low Gate Charge
- Lead Free and Green Available

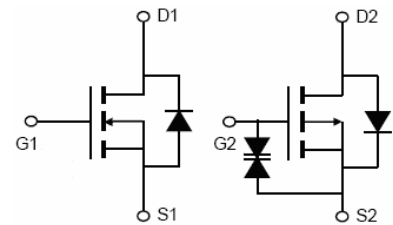
100% UIS TESTED!
 100% ΔV_{ds} TESTED!



SOP-8 Dual



Pin 5 ssignment



Schematic diagram

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

Parameter		Symbol	N-Channel	P-Channel	Unit
Drain-Source Voltage		V_{DS}	40	-40	V
Gate-Source Voltage		V_{GS}	± 20	± 20	V
Continuous Drain Current	$T_A=25^\circ\text{C}$	I_D	8	-7	A
	$T_A=70^\circ\text{C}$		6	-5.5	
Pulsed Drain Current (Note 1)		I_{DM}	40	-30	A
Maximum Power Dissipation	$T_A=25^\circ\text{C}$	P_D	2.0	2.0	W
Operating Junction and Storage Temperature Range		T_J, T_{STG}	-55 To 150	-55 To 150	$^\circ\text{C}$

Thermal Characteristic

Thermal Resistance, Junction-to-Ambient (Note2)	$R_{\theta JA}$	N-Ch	62.5	$^\circ\text{C/W}$
Thermal Resistance, Junction-to-Ambient (Note2)	$R_{\theta JA}$	P-Ch	62.5	$^\circ\text{C/W}$

N-CH Electrical Characteristics ($T_A=25^{\circ}\text{C}$ unless otherwise noted)

Parameter	Symbol	Condition	Min	Typ	Max	Unit
Off Characteristics						
Drain-Source Breakdown Voltage	BV_{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	μA
Gate-Body Leakage Current	I_{GSS}	$V_{GS}=\pm 20V, V_{DS}=0V$	-	-	± 100	nA
On Characteristics (Note 3)						
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS}=V_{GS}, I_D=250\mu A$	1		2.0	V
Drain-Source On-State Resistance	$R_{DS(on)}$	$V_{GS}=10V, I_D=8A$	-		14	m Ω
		$V_{GS}=4.5V, I_D=4A$	-		19	m Ω
Forward Transconductance	g_{FS}	$V_{DS}=5V, I_D=8A$	33	-	-	S
Dynamic Characteristics (Note 4)						
Input Capacitance	C_{iss}	$V_{DS}=20V, V_{GS}=0V,$ $F=1.0MHz$	-	1110	-	PF
Output Capacitance	C_{oss}		-	114	-	PF
Reverse Transfer Capacitance	C_{rss}		-	109	-	PF
Switching Characteristics (Note 4)						
Turn-on Delay Time	$t_{d(on)}$	$V_{DD}=20V, R_L=2.5\Omega$ $V_{GS}=10V, R_{GEN}=3\Omega$	-	5.5	-	nS
Turn-on Rise Time	t_r		-	14	-	nS
Turn-Off Delay Time	$t_{d(off)}$		-	24	-	nS
Turn-Off Fall Time	t_f		-	12	-	nS
Total Gate Charge	Q_g	$V_{DS}=20V, I_D=8A,$ $V_{GS}=10V$	-	30	-	nC
Gate-Source Charge	Q_{gs}		-	5	-	nC
Gate-Drain Charge	Q_{gd}		-	7	-	nC
Drain-Source Diode Characteristics						
Diode Forward Voltage (Note 3)	V_{SD}	$V_{GS}=0V, I_S=8A$	-	0.8	1.2	V

P-CH Electrical Characteristics ($T_A=25^{\circ}\text{C}$ unless otherwise noted)

Parameter	Symbol	Condition	Min	Typ	Max	Unit
Off Characteristics						
Drain-Source Breakdown Voltage	BV_{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	μA
Gate-Body Leakage Current	I_{GSS}	$V_{GS}=\pm 20V, V_{DS}=0V$	-	-	± 100	nA
On Characteristics (Note 3)						
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS}=V_{GS}, I_D=-250\mu A$	-1.0		-2.0	V
Drain-Source On-State Resistance	$R_{DS(on)}$	$V_{GS}=-10V, I_D=-7A$	-		29	m Ω
		$V_{GS}=-4.5V, I_D=-4A$	-		34	m Ω
Forward Transconductance	g_{FS}	$V_{DS}=-5V, I_D=-7A$	20	-	-	S
Dynamic Characteristics (Note4)						
Input Capacitance	C_{iss}	$V_{DS}=-20V, V_{GS}=0V,$ $F=1.0MHz$	-	1139	-	PF
Output Capacitance	C_{oss}		-	114	-	PF
Reverse Transfer Capacitance	C_{riss}		-	103	-	PF
Switching Characteristics (Note 4)						
Turn-on Delay Time	$t_{d(on)}$	$V_{DD}=-20V, R_L=2.9\Omega$ $V_{GS}=-10V, R_{GEN}=6\Omega$	-	7.5	-	nS
Turn-on Rise Time	t_r		-	5.5	-	nS
Turn-Off Delay Time	$t_{d(off)}$		-	19	-	nS
Turn-Off Fall Time	t_f		-	7	-	nS
Total Gate Charge	Q_g	$V_{DS}=-20V, I_D=-7A$ $V_{GS}=-10V$	-	22.5	-	nC
Gate-Source Charge	Q_{gs}		-	2.4	-	nC
Gate-Drain Charge	Q_{gd}		-	5.1	-	nC
Drain-Source Diode Characteristics						
Diode Forward Voltage (Note 3)	V_{SD}	$V_{GS}=0V, I_S=-7A$	-	-	-1.2	V

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

N- Channel Typical Electrical and Thermal Characteristics (Curves)

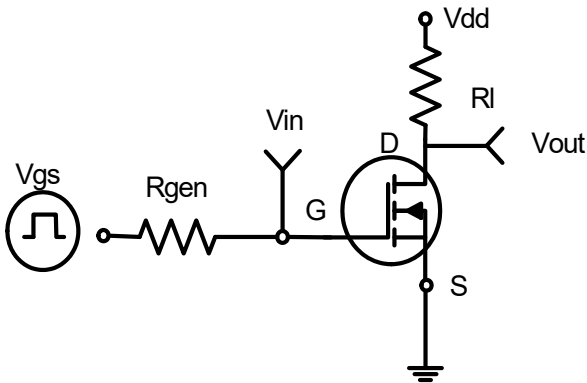


Figure 1: Switching Test Circuit

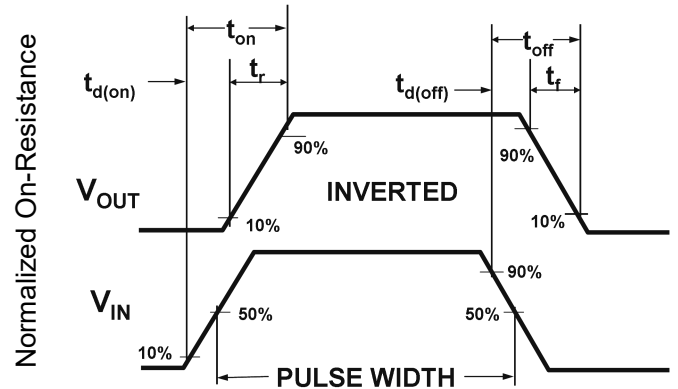


Figure 2: Switching Waveforms

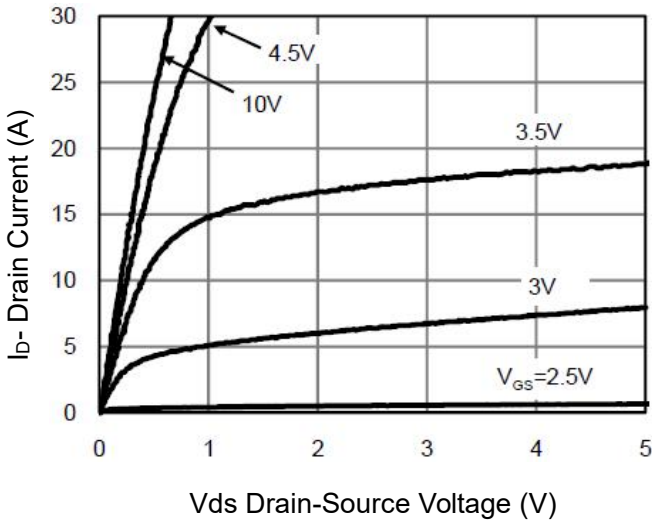


Figure 3 Output Characteristics

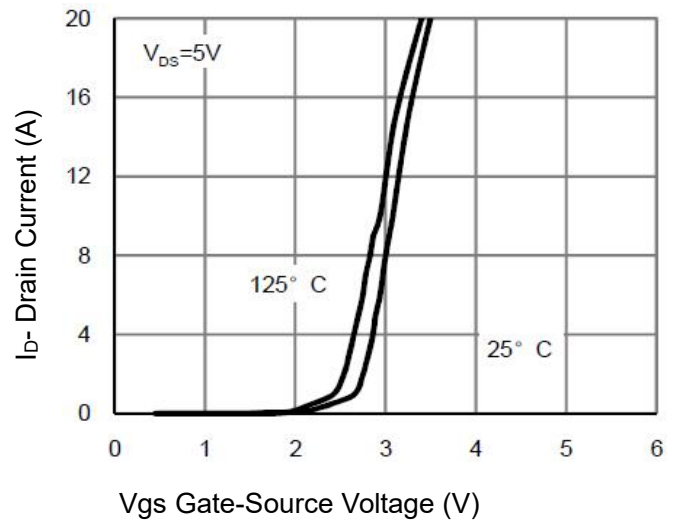


Figure 4 Transfer Characteristics

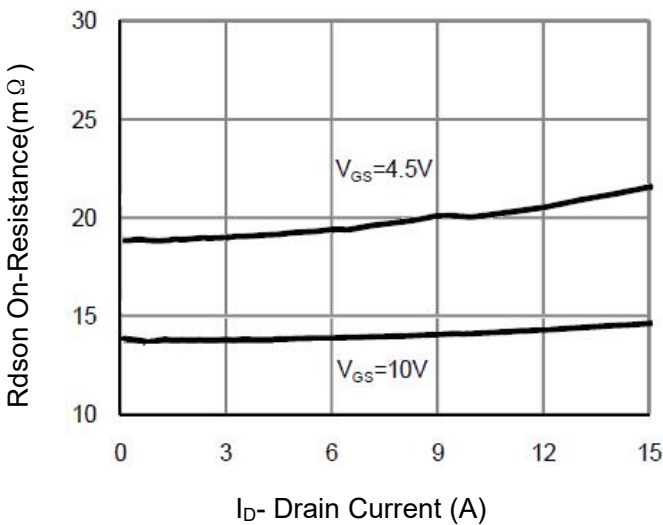


Figure 5 Drain-Source On-Resistance

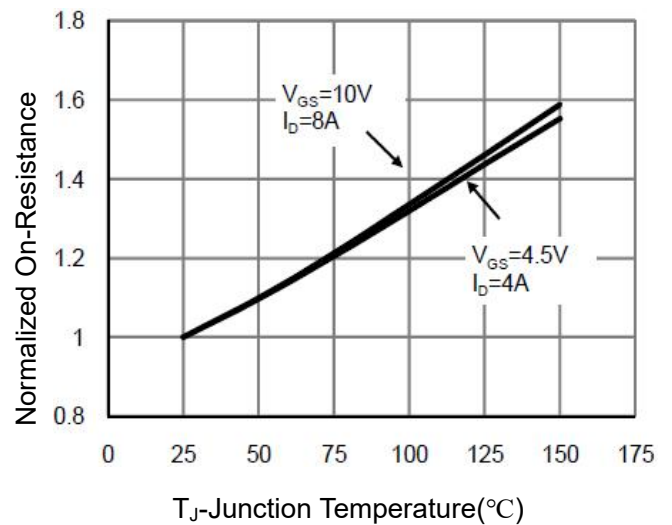
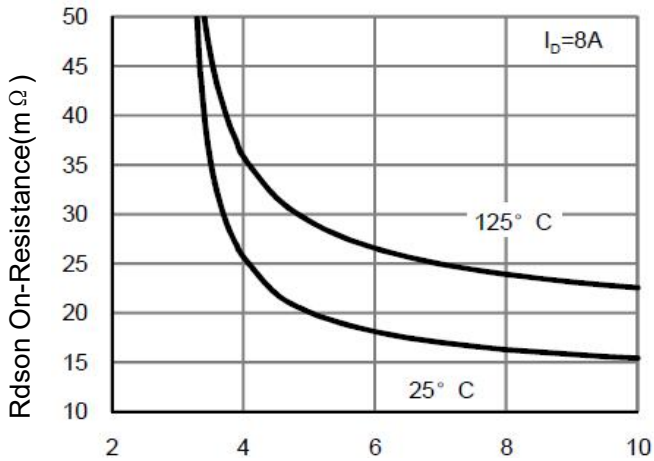
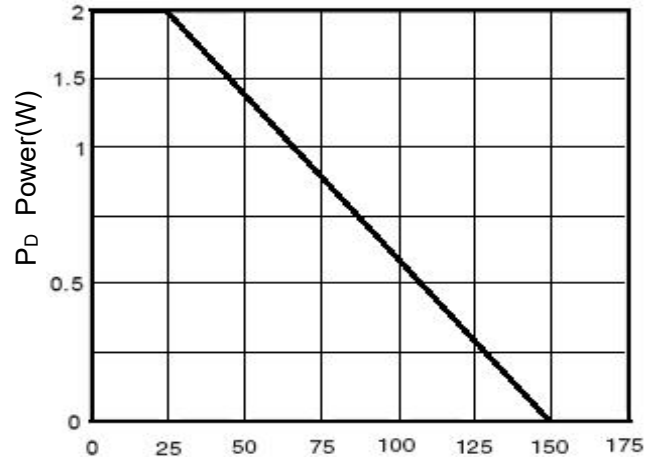


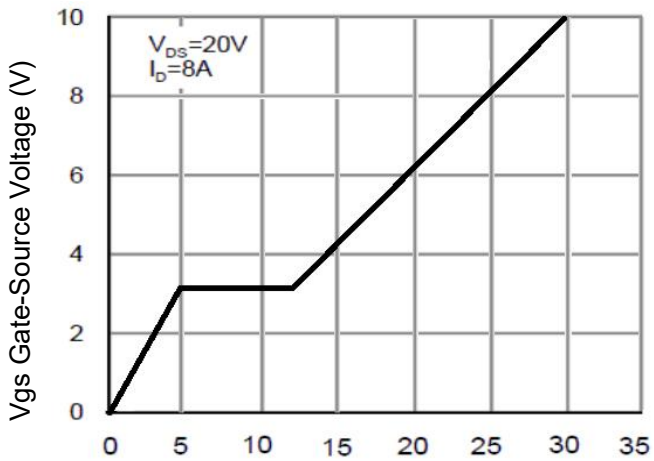
Figure 6 Drain-Source On-Resistance



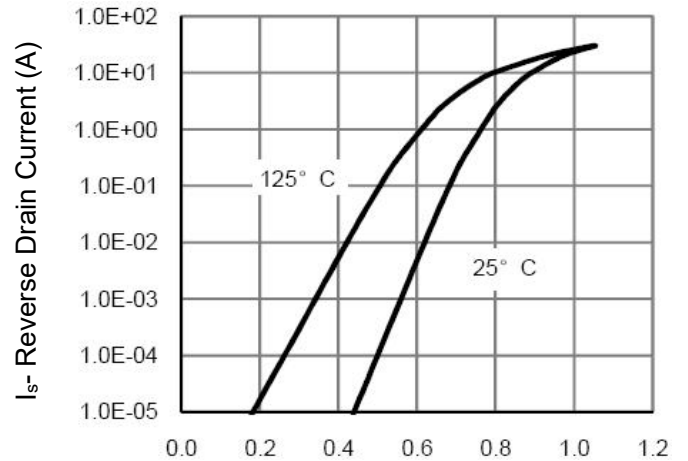
Vgs Gate-Source Voltage (V)
Figure 7 Rdson vs Vgs



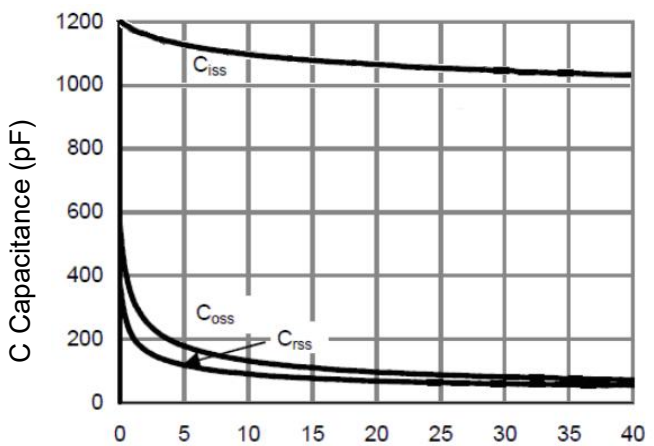
T_J-Junction Temperature(°C)
Figure 8 Power Dissipation



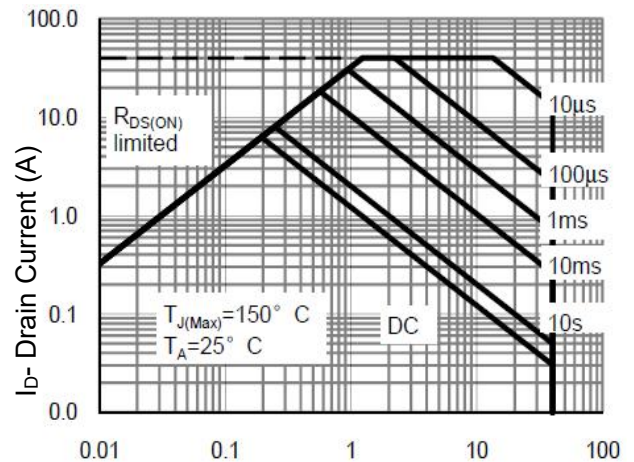
Qg Gate Charge (nC)
Figure 9 Gate Charge



Vds Drain-Source Voltage (V)
Figure 10 Source- Drain Diode Forward



Vds Drain-Source Voltage (V)
Figure 11 Capacitance vs Vds



Vds Drain-Source Voltage (V)
Figure 12 Safe Operation Area

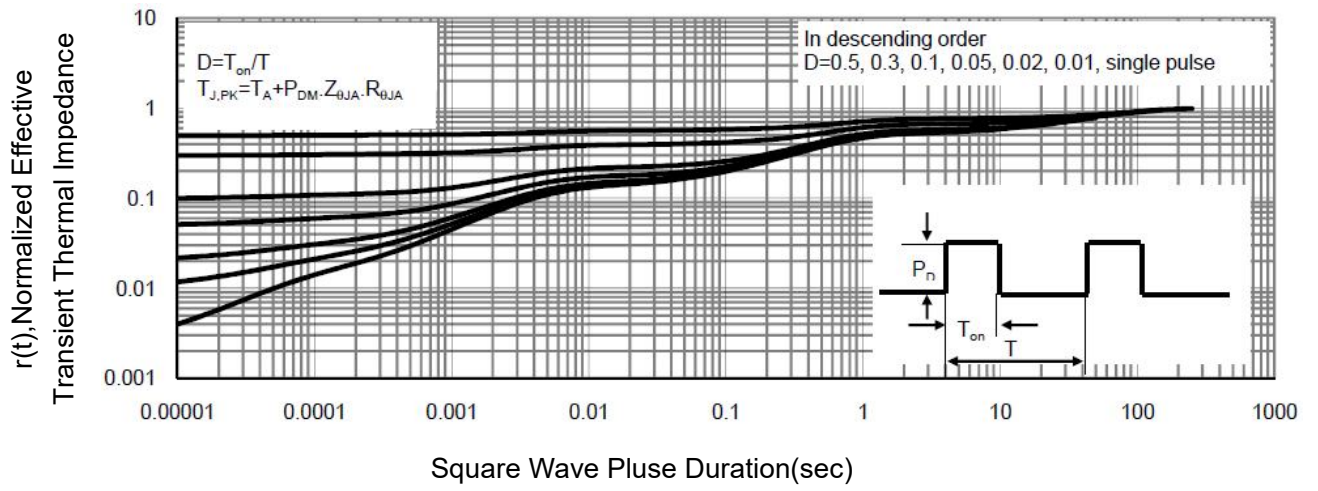


Figure 13 Normalized Maximum Transient Thermal Impedance

P- Channel Typical Electrical and Thermal Characteristics (Curves)

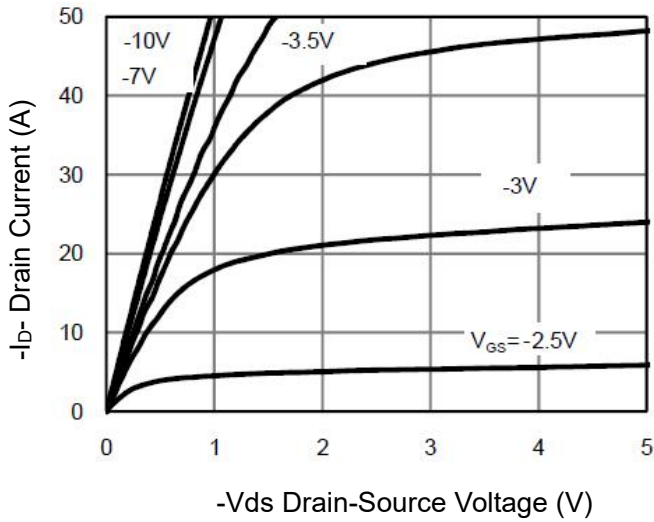


Figure 1 Output Characteristics

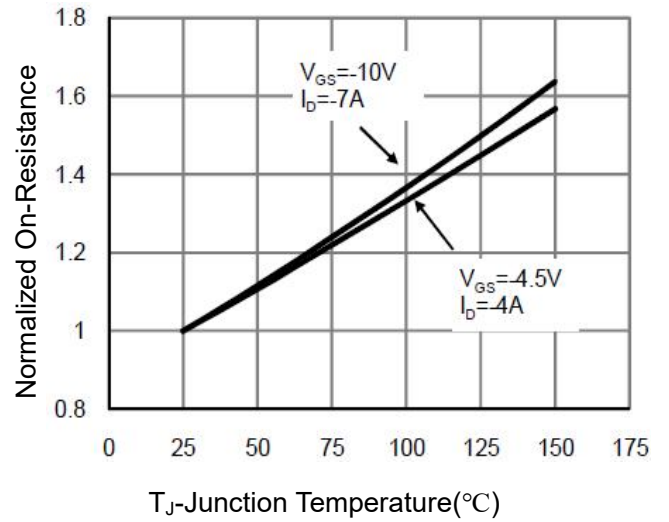


Figure 4 Rdson-Junction Temperature

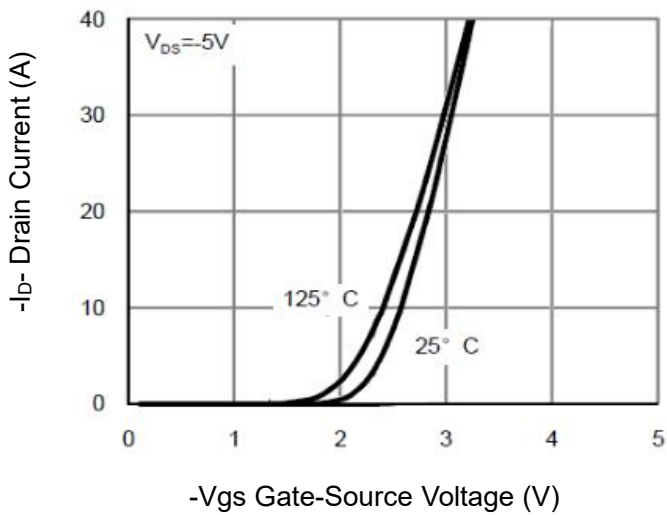


Figure 2 Transfer Characteristics

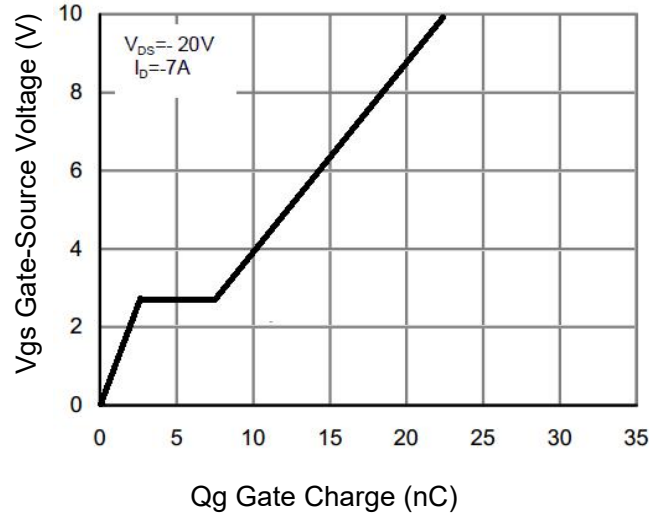


Figure 5 Gate Charge

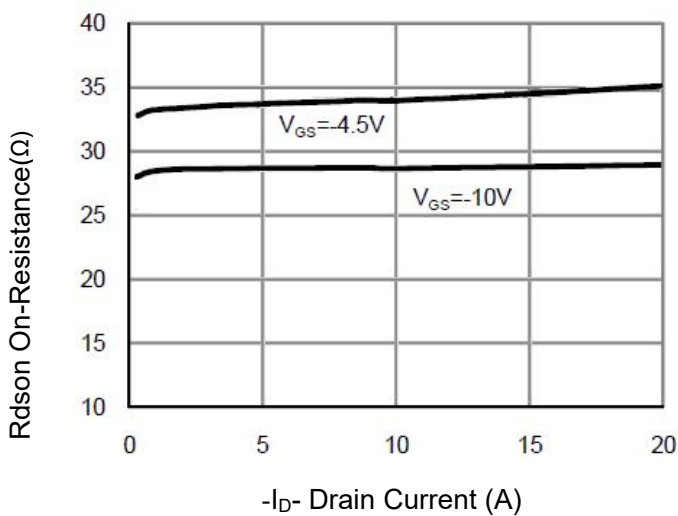


Figure 3 Rdson- Drain Current

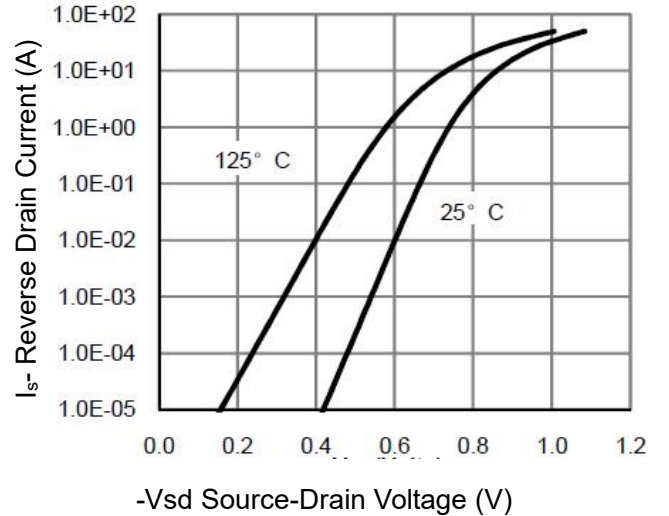
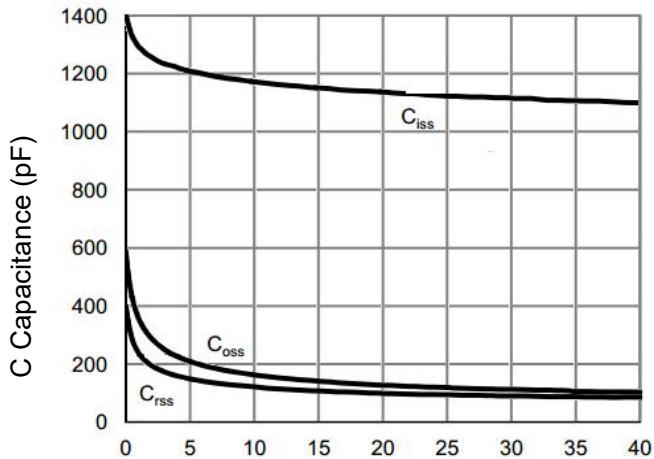
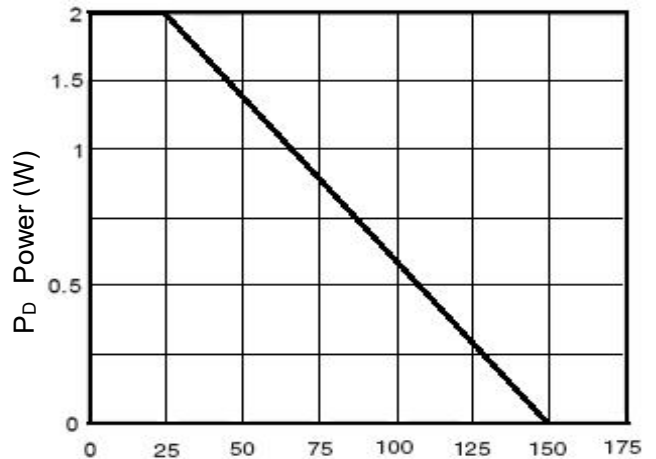


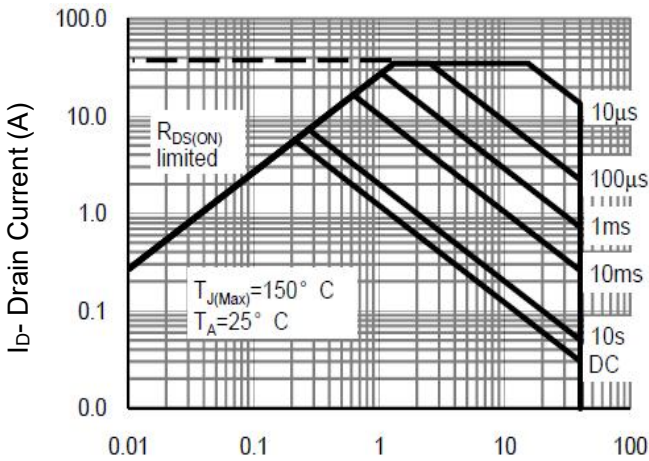
Figure 6 Source- Drain Diode Forward



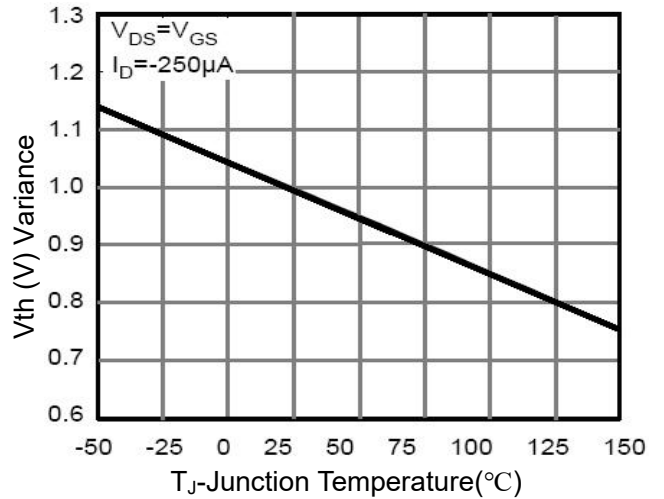
-Vds Drain-Source Voltage (V)
Figure 7 Capacitance vs Vds



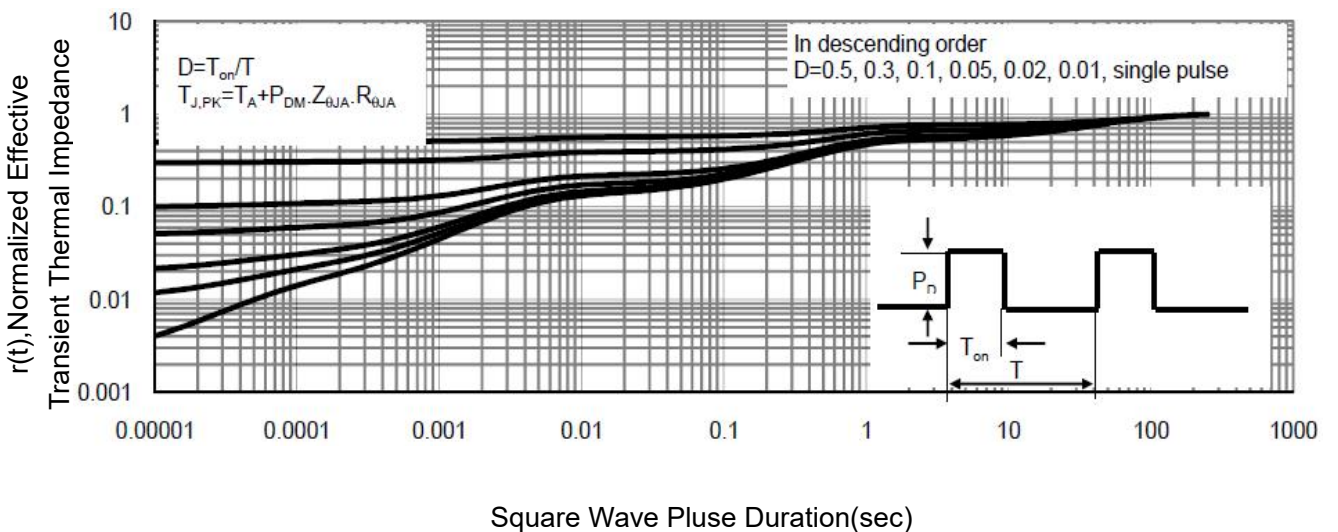
T_J-Junction Temperature(°C)
Figure 9 Power Dissipation



-Vds Drain-Source Voltage (V)
Figure 8 Safe Operation Area



T_J-Junction Temperature(°C)
Figure 10 V_{GS(th)} vs Junction Temperature



Square Wave Pulse Duration(sec)
Figure 11 Normalized Maximum Transient Thermal Impedance