




# Power MOSFETS


## DATASHEET

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**LM20260CLA6A**

N-Channel AND P-Channel  
Enhancement Mode MOSFET

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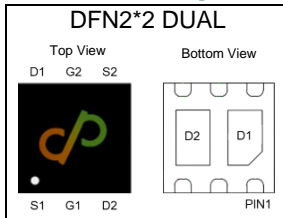


Quality Management Systems

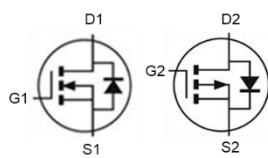
ISO 9001:2015 Certificate

## N-Channel AND P-Channel Enhancement Mode MOSFET

### Pin Description



Symbol



### Ordering Information

Symbol	N-Channel	P-Channel	Unit
$V_{DSS}$	20	-20	V
$R_{DS(ON)}$	25	77	m $\Omega$
$I_D$	4.9	-2.8	A

### Feature

- Reliable and Rugged
- ROHS Compliant & Halogen-Free

### Applications

- Load Switch
- Networking

### Ordering Information

Orderable Part Number	Package Type	Form	Shipping	Marking
LM20260CLA6A	DFN2*2(Dual)	Tape & Reel	4000 / Tape & Reel	0□□□

### Absolute Maximum Ratings (T<sub>J</sub>=25°C Unless Otherwise Noted)

Symbol	Parameter		N-Channel	P- Channel	Unit
$V_{DSS}$	Drain-Source Voltage		20	-20	V
$V_{GSS}$	Gate-Source Voltage		±12	±12	
$T_J$	Maximum Junction Temperature		150	150	°C
$T_{STG}$	Storage Temperature Range		-55 to 150	-55 to 150	°C
$I_{DM}$	Pulse Drain Current Tested	$T_A=25^\circ\text{C}$	10 <sup>①</sup>	-7.1	A
$I_D$	Continuous Drain Current	$T_A=25^\circ\text{C}$	4.9	-2.8	A
		$T_A=70^\circ\text{C}$	3.9	-2.3	
$P_D$	Maximum Power Dissipation	$T_A=25^\circ\text{C}$	0.9		W
		$T_A=70^\circ\text{C}$	0.6		
$I_{AS}$	Avalanche Current, Single pulse	L=0.1mH	10 <sup>①</sup>	-5.5	A
$E_{AS}$ <sup>②</sup>	Avalanche Energy, Single pulse	L=0.1mH	5	1.5	mJ

### Thermal Characteristics

Symbol	Parameter		Rating	Unit
$R_{\theta JA}$ <sup>③</sup>	Thermal Resistance-Junction to Ambient	t<=10s	85	°C/W
		Steady State	135	°C/W

Note ① : Max. current is limited by bonding wire.

Note ② : UIS tested and pulse width are limited by maximum junction temperature 150°C

Note ③ : Surface Mounted on 1in<sup>2</sup> FR-4 board with 1oz.

## N-Channel Electrical Characteristics (T<sub>J</sub>=25°C Unless Otherwise Noted)

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
<b>Static Electrical Characteristics</b>						
<b>BV<sub>DSS</sub></b>	Drain-Source Breakdown Voltage	V <sub>GS</sub> =0V, I <sub>DS</sub> =250uA	20	-	-	V
<b>I<sub>DSS</sub></b>	Zero Gate Voltage Drain Current	V <sub>DS</sub> =16V, V <sub>GS</sub> =0V	-	-	1	uA
<b>V<sub>GS(th)</sub></b>	Gate Threshold Voltage	V <sub>DS</sub> =V <sub>GS</sub> , I <sub>DS</sub> =250uA	0.4	0.65	0.9	V
<b>I<sub>GSS</sub></b>	Gate Leakage Current	V <sub>GS</sub> =±12V, V <sub>DS</sub> =0V	-	-	±100	nA
<b>R<sub>DS(ON)</sub><sup>④</sup></b>	Drain-Source On-state Resistance	V <sub>GS</sub> =4.5V, I <sub>DS</sub> =1.5A	-	21	25	mΩ
		V <sub>GS</sub> =2.5V, I <sub>DS</sub> =1.5A	-	25	33	
<b>gfs</b>	Forward Transconductance	V <sub>DS</sub> =10V, I <sub>DS</sub> =1.5A	-	4.7	-	S
<b>Dynamic Characteristics<sup>⑥</sup></b>						
<b>R<sub>G</sub></b>	Gate Resistance	V <sub>GS</sub> =0V, V <sub>DS</sub> =0V, Freq.=1MHz	-	2	-	Ω
<b>C<sub>iss</sub></b>	Input Capacitance	V <sub>GS</sub> =0V, V <sub>DS</sub> =10V, Freq.=1MHz	-	427	-	pF
<b>C<sub>OSS</sub></b>	Output Capacitance		-	61	-	
<b>C<sub>rss</sub></b>	Reverse Transfer Capacitance		-	53	-	
<b>t<sub>d(ON)</sub></b>	Turn-on Delay Time	V <sub>GS</sub> =4.5V, V <sub>DS</sub> =10V, I <sub>D</sub> =1A, R <sub>GEN</sub> =6Ω	-	4	-	nS
<b>t<sub>r</sub></b>	Turn-on Rise Time		-	14	-	
<b>t<sub>d(OFF)</sub></b>	Turn-off Delay Time		-	26	-	
<b>t<sub>f</sub></b>	Turn-off Fall Time		-	7.6	-	
<b>Q<sub>g</sub></b>	Total Gate Charge	V <sub>GS</sub> =4.5V, V <sub>DS</sub> =10V, I <sub>D</sub> =6A	-	8.6	-	nC
<b>Q<sub>gs</sub></b>	Gate-Source Charge		-	0.7	-	
<b>Q<sub>gd</sub></b>	Gate-Drain Charge		-	3.2	-	
<b>Source-Drain Characteristics</b>						
<b>V<sub>SD</sub><sup>④</sup></b>	Diode Forward Voltage	I <sub>SD</sub> =1A, V <sub>GS</sub> =0V	-	0.75	1.1	V
<b>t<sub>rr</sub></b>	Reverse Recovery Time	I <sub>F</sub> =6A, V <sub>R</sub> =10V	-	18	-	nS
<b>Q<sub>rr</sub></b>	Reverse Recovery Charge	dI <sub>F</sub> /dt=100A/μs	-	5.5	-	nC

Note ④ : Pulse test (pulse width≤300us, duty cycle≤2%).

Note ⑤ : Guaranteed by design, not subject to production testing.

## N-Channel Typical Characteristics

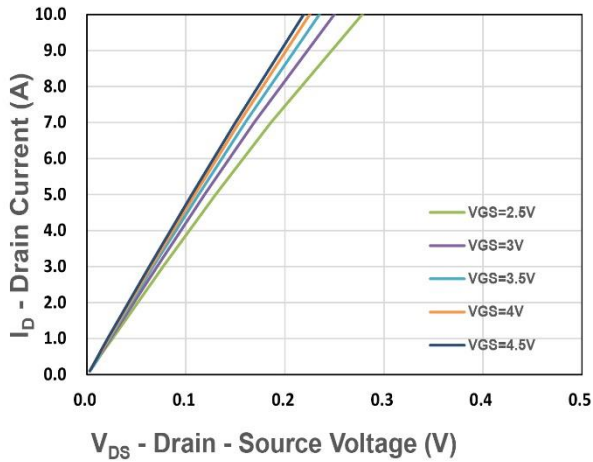


Figure 1. Output Characteristics

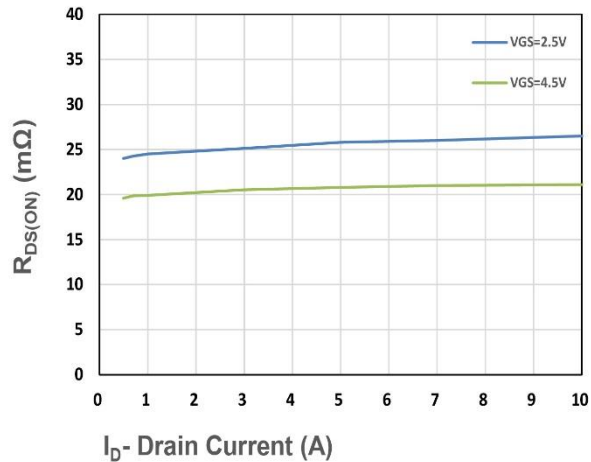


Figure 2. On-Resistance vs.  $I_D$

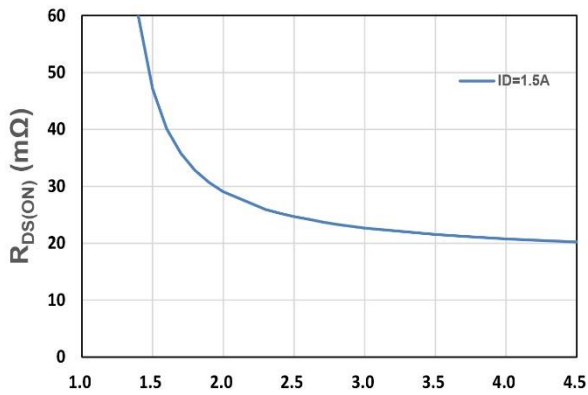


Figure 3. On-Resistance vs.  $V_{GS}$

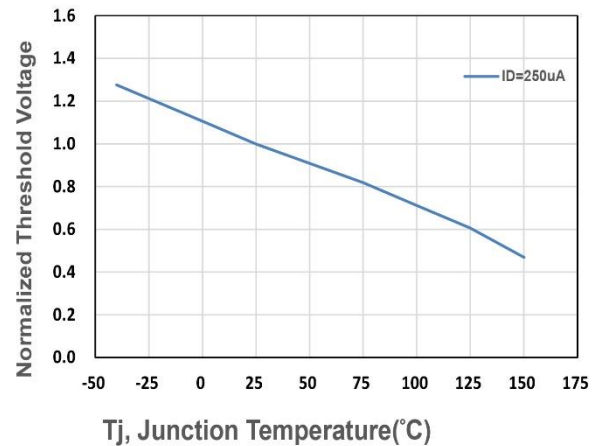


Figure 4. Gate Threshold Voltage

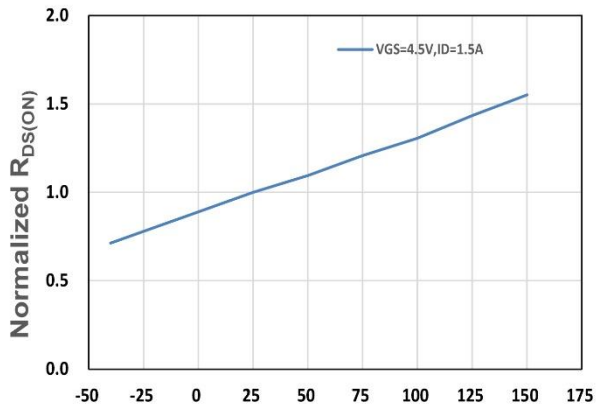


Figure 5. Drain-Source On Resistance

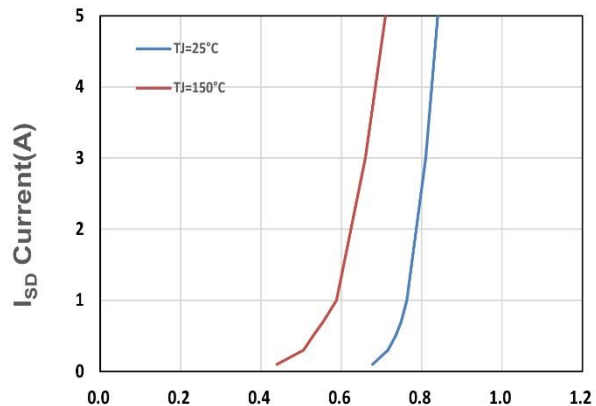
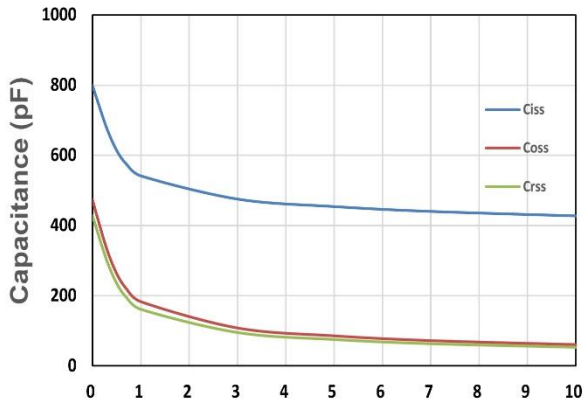
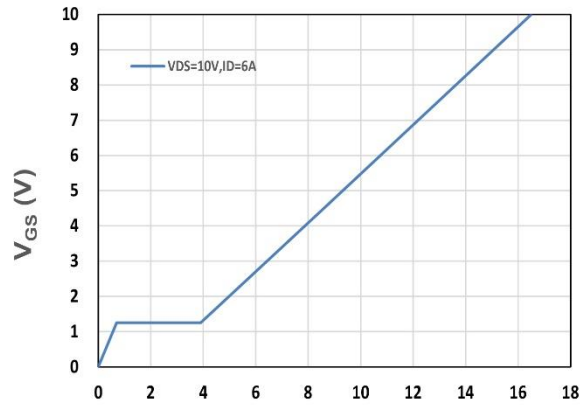


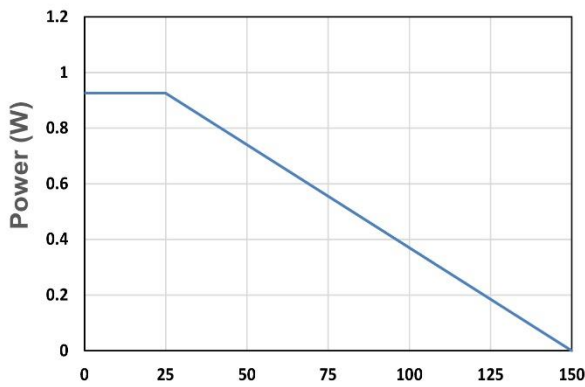
Figure 6. Source-Drain Diode Forward



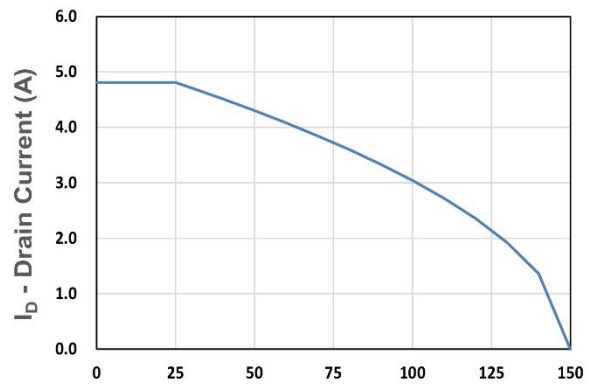
$V_{DS}$  - Drain - Source Voltage (V)  
Figure 7. Capacitance



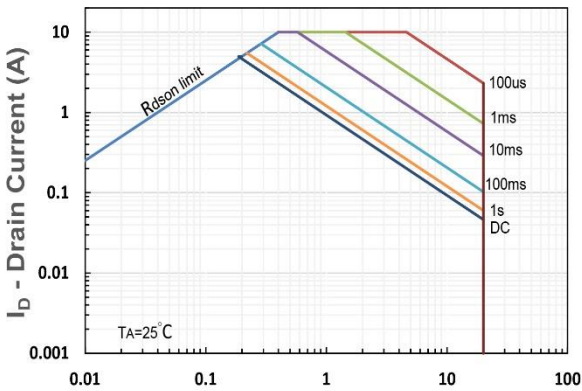
$Q_g$ , Total Gate Charge (nC)  
Figure 8. Gate Charge Characteristics



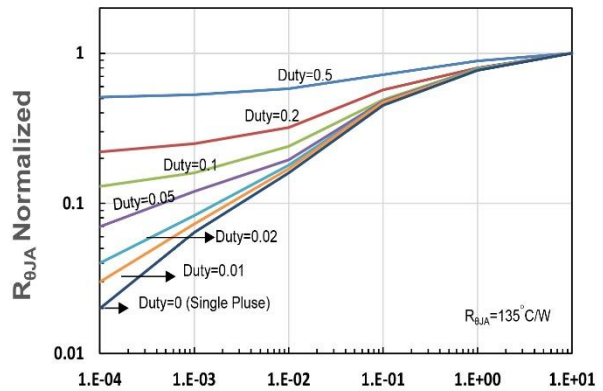
$T_A$  - Ambient Temperature(°C)  
Figure 9. Power Dissipation



$T_A$  - Ambient Temperature(°C)  
Figure 10. Drain Current



$V_{DS}$  - Drain-Source Voltage (V)  
Figure 11. Safe Operating Area



$t_1$ , Square Wave Pulse Duration(s)  
Figure 12.  $R_{\theta JA}$  Transient Thermal Impedance

## P-Channel Electrical Characteristics (T<sub>J</sub>=25°C Unless Otherwise Noted)

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
<b>Static Electrical Characteristics</b>						
<b>BV<sub>DSS</sub></b>	Drain-Source Breakdown Voltage	V <sub>GS</sub> =0V, I <sub>DS</sub> =-250uA	-20	-	-	V
<b>I<sub>DSS</sub></b>	Zero Gate Voltage Drain Current	V <sub>DS</sub> =-16V, V <sub>GS</sub> =0V	-	-	-1	uA
<b>V<sub>GS(th)</sub></b>	Gate Threshold Voltage	V <sub>DS</sub> =V <sub>GS</sub> , I <sub>DS</sub> =-250uA	-0.45	-0.7	-0.95	V
<b>I<sub>GSS</sub></b>	Gate Leakage Current	V <sub>GS</sub> =±12V, V <sub>DS</sub> =0V	-	-	±100	nA
<b>R<sub>DS(ON)</sub></b> <sup>④</sup>	Drain-Source On-state Resistance	V <sub>GS</sub> =-4.5V, I <sub>DS</sub> =-1A	-	64	77	mΩ
		V <sub>GS</sub> =-2.5V, I <sub>DS</sub> =-0.5A	-	78	101	
<b>gfs</b>	Forward Transconductance	V <sub>DS</sub> =-10V, I <sub>DS</sub> =-0.5A	-	3.1	-	S
<b>Dynamic Characteristics</b> <sup>⑥</sup>						
<b>R<sub>G</sub></b>	Gate Resistance	V <sub>GS</sub> =0V, V <sub>DS</sub> =0V, Freq.=1MHz	-	3.5	-	Ω
<b>C<sub>iss</sub></b>	Input Capacitance	V <sub>GS</sub> =0V, V <sub>DS</sub> =-10V, Freq.=1MHz	-	500	-	pF
<b>C<sub>OSS</sub></b>	Output Capacitance		-	55	-	
<b>C<sub>rss</sub></b>	Reverse Transfer Capacitance		-	51	-	
<b>t<sub>d(ON)</sub></b>	Turn-on Delay Time	V <sub>GS</sub> =-4.5V, V <sub>DS</sub> =-10V, I <sub>D</sub> =-1A, R <sub>GEN</sub> =6Ω	-	4	-	nS
<b>t<sub>r</sub></b>	Turn-on Rise Time		-	7.2	-	
<b>t<sub>d(OFF)</sub></b>	Turn-off Delay Time		-	14	-	
<b>t<sub>f</sub></b>	Turn-off Fall Time		-	9.1	-	
<b>Q<sub>g</sub></b>	Total Gate Charge	V <sub>GS</sub> =-4.5V, V <sub>DS</sub> =-10V, I <sub>D</sub> =-5A	-	3.7	-	nC
<b>Q<sub>gs</sub></b>	Gate-Source Charge		-	0.4	-	
<b>Q<sub>gd</sub></b>	Gate-Drain Charge		-	1.3	-	
<b>Source-Drain Characteristics</b>						
<b>V<sub>SD</sub></b> <sup>④</sup>	Diode Forward Voltage	I <sub>SD</sub> =-1A, V <sub>GS</sub> =0V	-	-0.8	-1.1	V
<b>t<sub>rr</sub></b>	Reverse Recovery Time	I <sub>F</sub> =-5A, V <sub>R</sub> =-10V	-	5.5	-	nS
<b>Q<sub>rr</sub></b>	Reverse Recovery Charge	dI <sub>F</sub> /dt=100A/μs	-	2.1	-	nC

## P-Channel Typical Characteristics

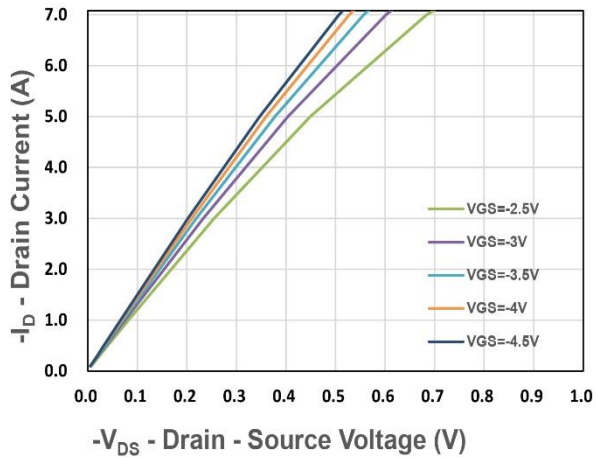


Figure 1. Output Characteristics

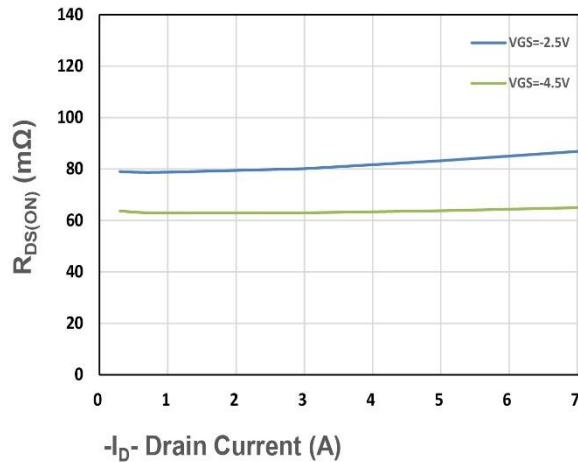


Figure 2. On-Resistance vs. ID

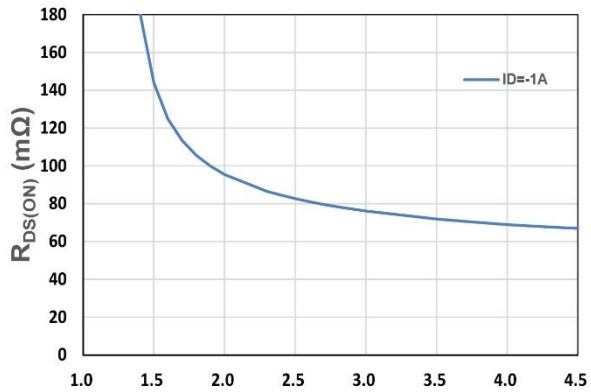


Figure 3. On-Resistance vs. VGS

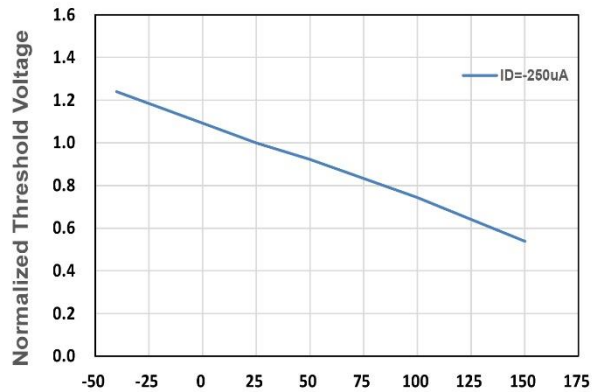


Figure 4. Gate Threshold Voltage

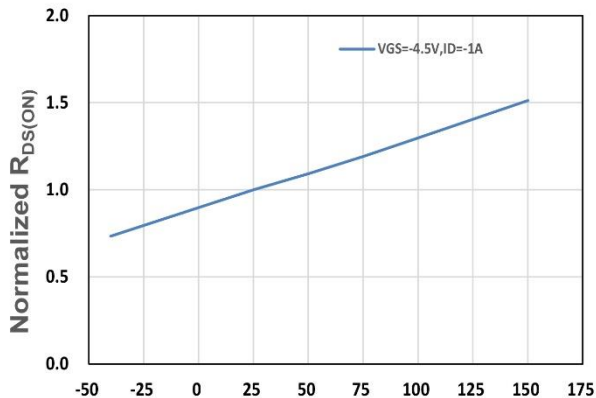


Figure 5. Drain-Source On Resistance

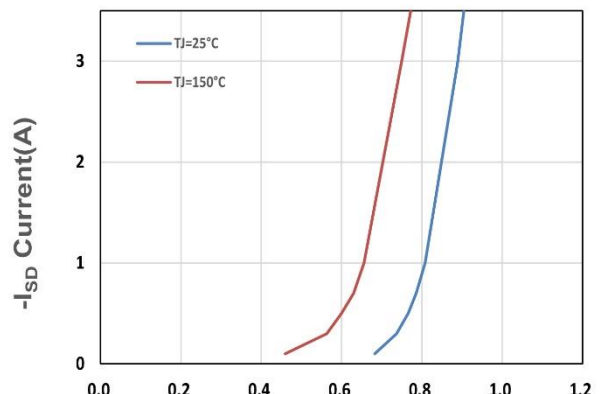
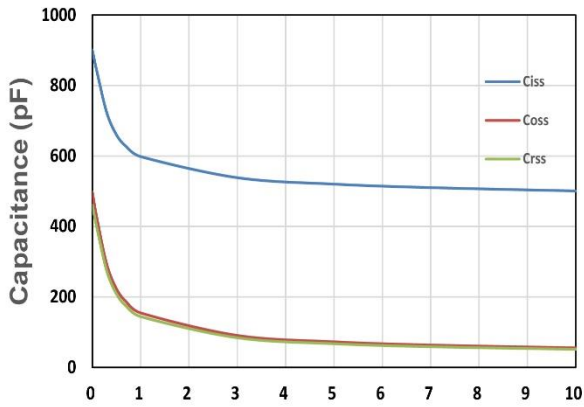
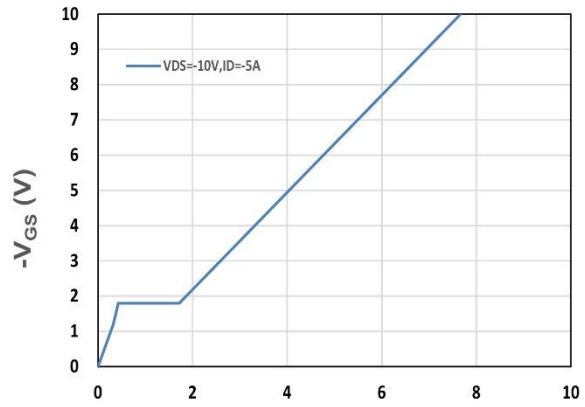


Figure 6. Source-Drain Diode Forward

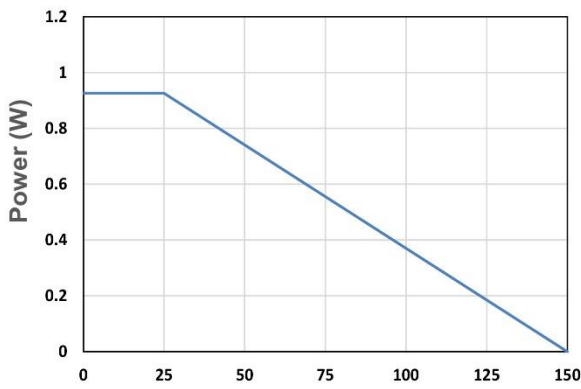




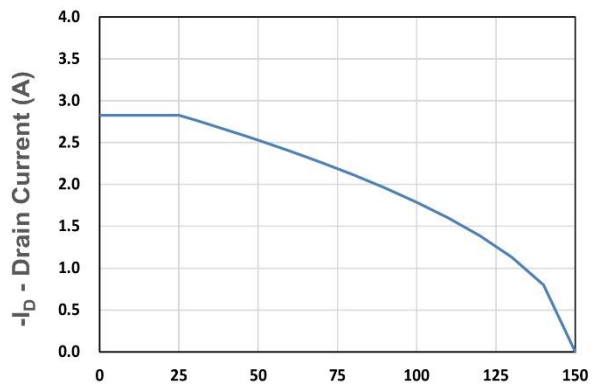
$-V_{DS}$  - Drain - Source Voltage (V)  
Figure 7. Capacitance



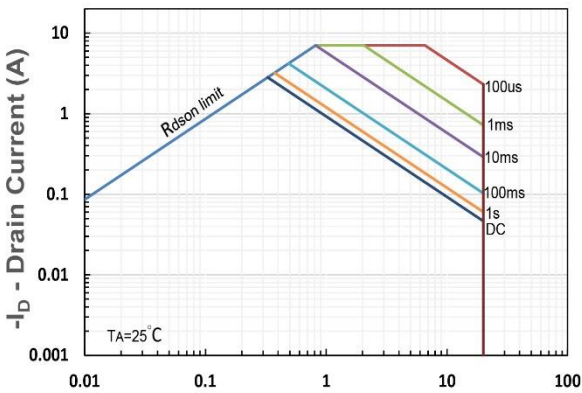
$Q_g$ , Total Gate Charge (nC)  
Figure 8. Gate Charge Characteristics



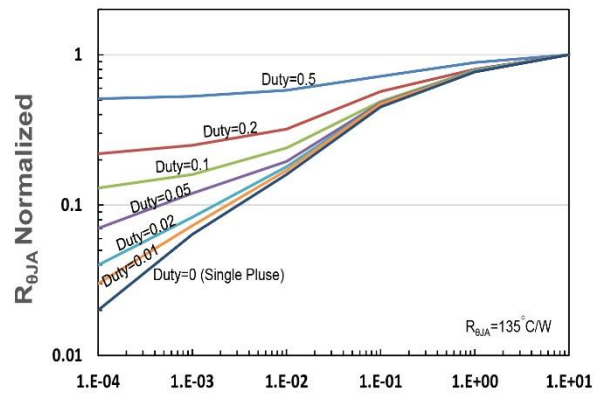
$T_A$  - Ambient Temperature (°C)  
Figure 9. Power Dissipation



$T_A$  - Junction Temperature (°C)  
Figure 10. Drain Current



$-V_{DS}$  - Drain-Source Voltage (V)  
Figure 11. Safe Operating Area



$t_1$ , Square Wave Pulse Duration (s)  
Figure 12.  $R_{\theta JA}$  Transient Thermal Impedance