

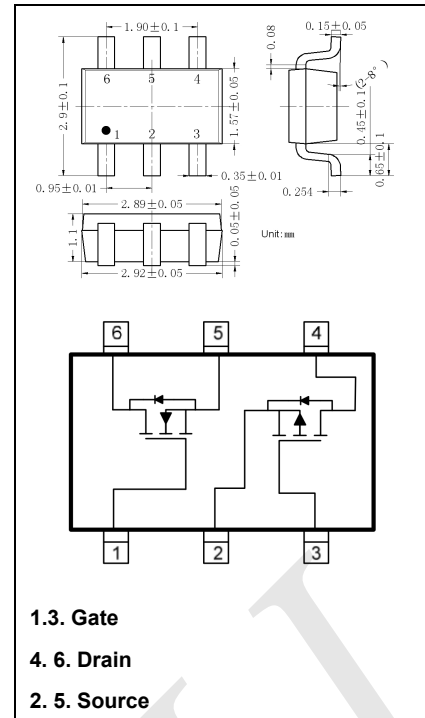
SOT-23-6L Plastic-Encapsulate MOSFETS

LJ-AP2530AGY-HF

N AND P-CHANNEL ENHANCEMENT MODE POWER MOSFET

Features

- N-CH BV_{DSS} 30V
 $R_{DS(ON)}$ 72m Ω
 I_D 3.3A
- P-CH BV_{DSS} -30V
 $R_{DS(ON)}$ 150m Ω
 I_D -2.3A
- Low Gate Charge
- Fast Switching Performance
- Surface Mount Package
- RoHS Compliant & Halogen-Free SOT-26



Description

Advanced Power MOSFETs utilized advanced processing techniques to achieve the lowest possible on-resistance, extremely efficient and cost-effectiveness device.

The SOT-26 package is widely used for commercial surface mount applications.

Absolute Maximum Ratings

Symbol	Parameter	Rating		Units
		N-channel	P-channel	
V_{DS}	Drain-Source Voltage	30	-30	V
V_{GS}	Gate-Source Voltage	± 20	± 20	V
$I_D@T_A=25^\circ C$	Continuous Drain Current ³	3.3	-2.3	A
$I_D@T_A=70^\circ C$	Continuous Drain Current ³	2.7	-1.8	A
I_{DM}	Pulsed Drain Current ¹	12	-10	A
$P_D@T_A=25^\circ C$	Total Power Dissipation	1.136		W
T_{STG}	Storage Temperature Range	-55 to 150		$^\circ C$
T_J	Operating Junction Temperature Range	-55 to 150		$^\circ C$

Thermal Data

Symbol	Parameter	Value	Unit
Rthj-a	Maximum Thermal Resistance, Junction-ambient ³	110	$^\circ C/W$

N-CH Electrical Characteristics @ $T_j=25^{\circ}\text{C}$ (unless otherwise specified)

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Units
BV_{DSS}	Drain-Source Breakdown Voltage	$V_{GS}=0V, I_D=250\mu A$	30	-	-	V
$R_{DS(ON)}$	Static Drain-Source On-Resistance ²	$V_{GS}=10V, I_D=3A$	-	-	72	$m\Omega$
		$V_{GS}=4.5V, I_D=2A$	-	-	135	$m\Omega$
$V_{GS(th)}$	Gate Threshold Voltage	$V_{DS}=V_{GS}, I_D=250\mu A$	1	-	3	V
g_{fs}	Forward Transconductance	$V_{DS}=5V, I_D=3A$	-	4.6	-	S
I_{DSS}	Drain-Source Leakage Current	$V_{DS}=24V, V_{GS}=0V$	-	-	1	μA
I_{GSS}	Gate-Source Leakage	$V_{GS}=\pm 20V, V_{DS}=0V$	-	-	± 100	nA
Q_g	Total Gate Charge ²	$I_D=3A$	-	2.8	4.5	nC
Q_{gs}	Gate-Source Charge	$V_{DS}=15V$	-	1.2	-	nC
Q_{gd}	Gate-Drain ("Miller") Charge	$V_{GS}=4.5V$	-	1.4	-	nC
$t_{d(on)}$	Turn-on Delay Time ²	$V_{DS}=15V$	-	5.5	-	ns
t_r	Rise Time	$I_D=1A$	-	6.5	-	ns
$t_{d(off)}$	Turn-off Delay Time	$R_G=3.3\Omega$	-	10	-	ns
t_f	Fall Time	$V_{GS}=10V$	-	2	-	ns
C_{iss}	Input Capacitance	$V_{GS}=0V$	-	200	320	pF
C_{oss}	Output Capacitance	$V_{DS}=15V$	-	60	-	pF
C_{rss}	Reverse Transfer Capacitance	$f=1.0\text{MHz}$	-	40	-	pF
R_g	Gate Resistance	$f=1.0\text{MHz}$	-	1	-	Ω

Source-Drain Diode

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Units
V_{SD}	Forward On Voltage ²	$I_S=0.9A, V_{GS}=0V$	-	-	1.2	V
t_{rr}	Reverse Recovery Time ²	$I_S=3A, V_{GS}=0V$	-	15	-	ns
Q_{rr}	Reverse Recovery Charge	$dI/dt=100A/\mu s$	-	8	-	nC

P-CH Electrical Characteristics @ $T_j=25^{\circ}\text{C}$ (unless otherwise specified)

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
BV_{DSS}	Drain-Source Breakdown Voltage	$V_{GS}=0V, I_D=-250\mu A$	-30	-	-	V
$R_{DS(ON)}$	Static Drain-Source On-Resistance ²	$V_{GS}=-10V, I_D=-2A$	-	-	150	m Ω
		$V_{GS}=-4.5V, I_D=-1A$	-	-	280	m Ω
$V_{GS(th)}$	Gate Threshold Voltage	$V_{DS}=V_{GS}, I_D=-250\mu A$	-1	-	-3	V
g_{fs}	Forward Transconductance	$V_{DS}=-5V, I_D=-2A$	-	2.9	-	S
I_{DSS}	Drain-Source Leakage Current	$V_{DS}=-24V, V_{GS}=0V$	-	-	-1	μA
I_{GSS}	Gate-Source Leakage	$V_{GS}=+20V, V_{DS}=0V$	-	-	+100	nA
Q_g	Total Gate Charge ²	$I_D=-2A$	-	2.5	4	nC
Q_{gs}	Gate-Source Charge	$V_{DS}=-15V$	-	0.8	-	nC
Q_{gd}	Gate-Drain ("Miller") Charge	$V_{GS}=-4.5V$	-	1.2	-	nC
$t_{d(on)}$	Turn-on Delay Time ²	$V_{DS}=-15V$	-	5.5	-	ns
t_r	Rise Time	$I_D=-1A$	-	8	-	ns
$t_{d(off)}$	Turn-off Delay Time	$R_G=3.3\Omega$	-	17	-	ns
t_f	Fall Time	$V_{GS}=-10V$	-	3	-	ns
C_{iss}	Input Capacitance	$V_{GS}=0V$	-	160	260	pF
C_{oss}	Output Capacitance	$V_{DS}=-15V$	-	60	-	pF
C_{rss}	Reverse Transfer Capacitance	$f=1.0\text{MHz}$	-	40	-	pF
R_g	Gate Resistance	$f=1.0\text{MHz}$	-	8	-	Ω

Source-Drain Diode

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Units
V_{SD}	Forward On Voltage ²	$I_S=0.9A, V_{GS}=0V$	-	-	1.2	V
t_{rr}	Reverse Recovery Time ²	$I_S=2A, V_{GS}=0V$	-	16	-	ns
Q_{rr}	Reverse Recovery Charge	$dI/dt=100A/\mu s$	-	9	-	nC

Notes:

1. Pulse width limited by Max. junction temperature.
2. Pulse test
3. Surface mounted on 1 in² copper pad of FR4 board, $t \leq 5\text{sec}$; 180 $^{\circ}\text{C}/\text{W}$ when mounted on min. copper pad.

N-Channel Typical Characteristics

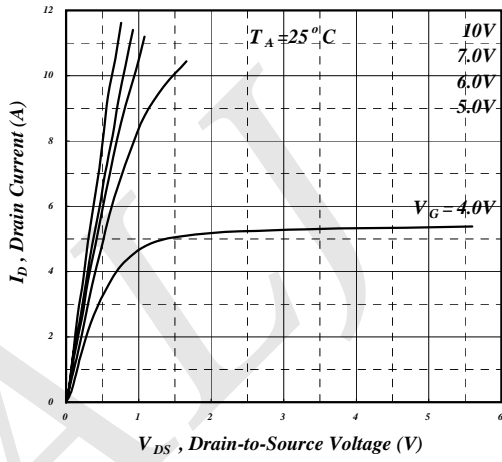


Fig 1. Typical Output Characteristics

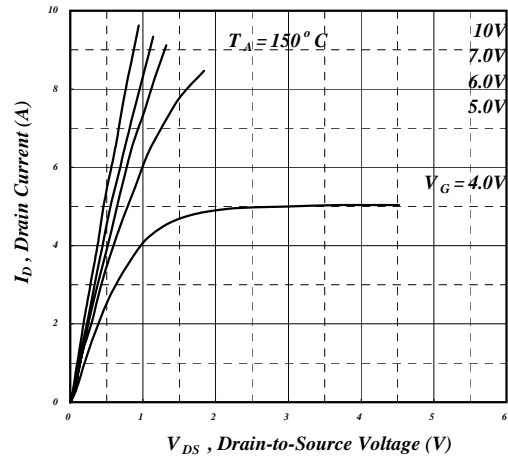


Fig 2. Typical Output Characteristics

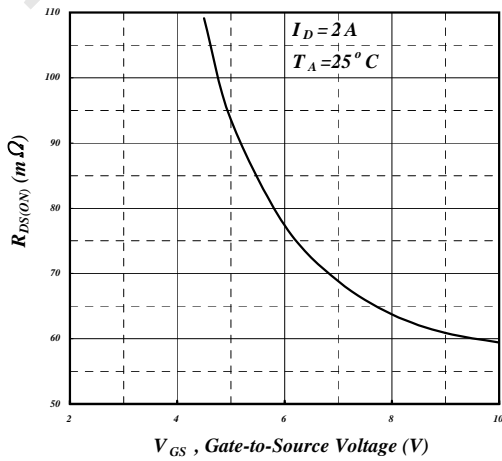


Fig 3. On-Resistance v.s. Gate Voltage

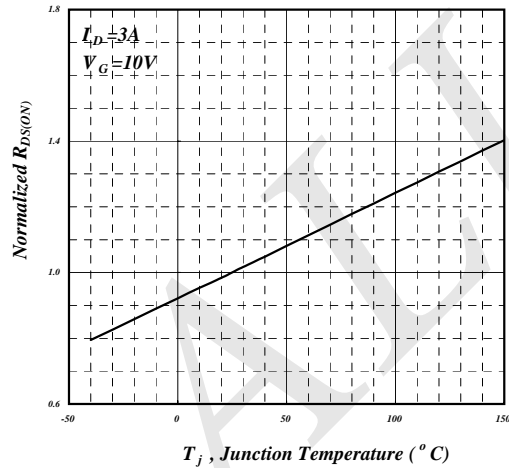


Fig 4. Normalized On-Resistance v.s. Junction Temperature

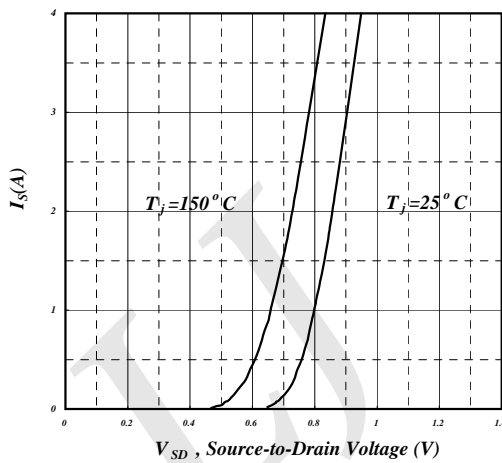


Fig 5. Forward Characteristic of Reverse Diode

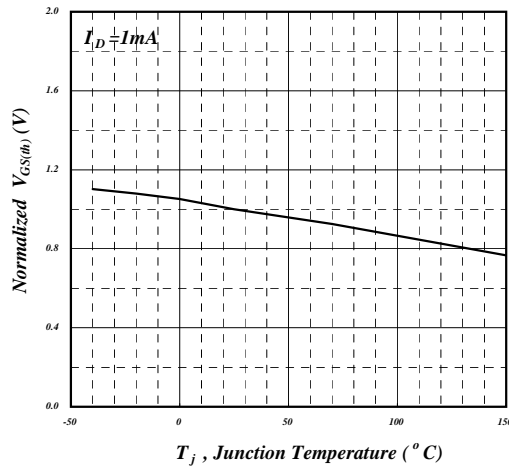


Fig 6. Gate Threshold Voltage v.s. Junction Temperature

N-Channel Typical Characteristics

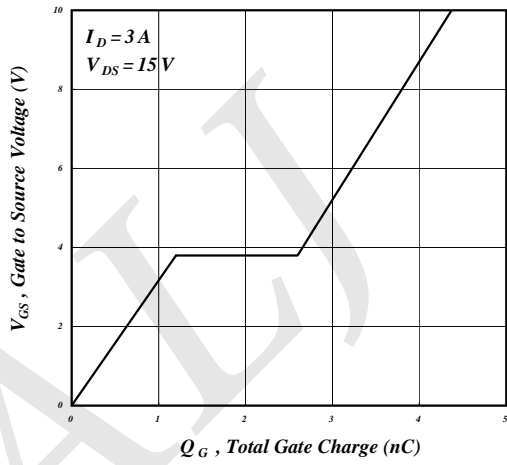


Fig 7. Gate Charge Characteristics

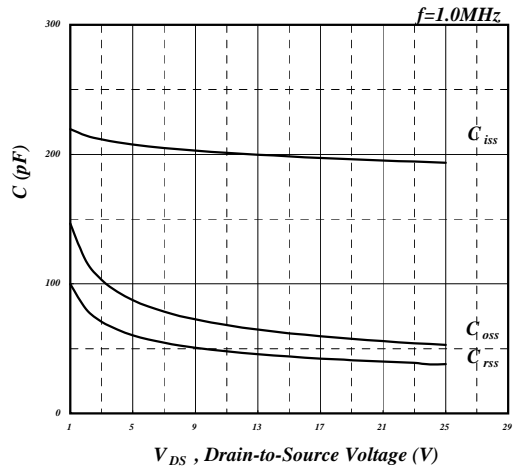


Fig 8. Typical Capacitance Characteristics

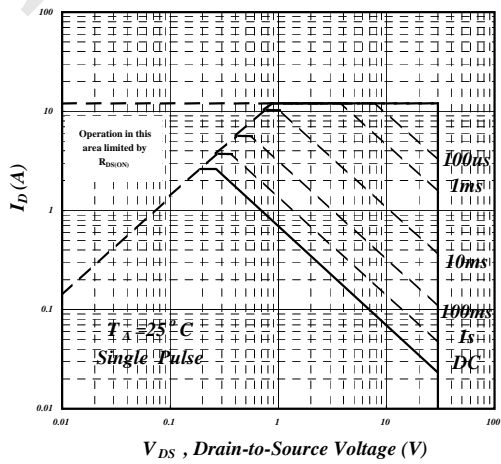


Fig 9. Maximum Safe Operating Area

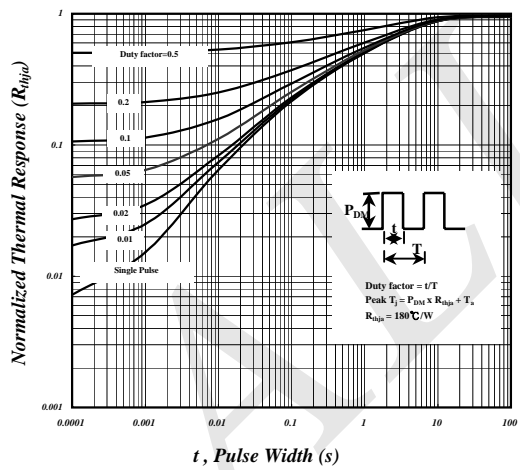


Fig 10. Effective Transient Thermal Impedance

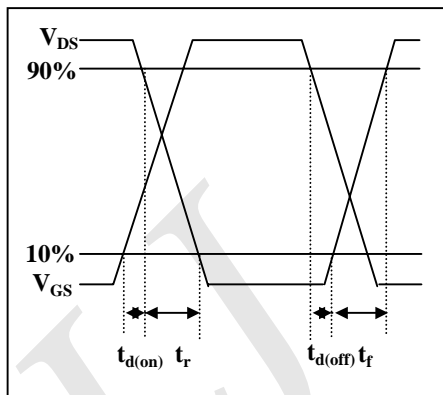


Fig 11. Switching Time Waveform

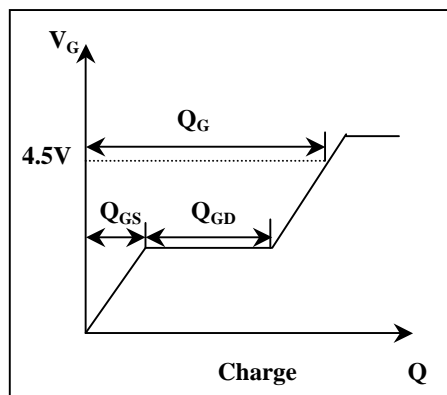


Fig 12. Gate Charge Waveform

P-Channel Typical Characteristics

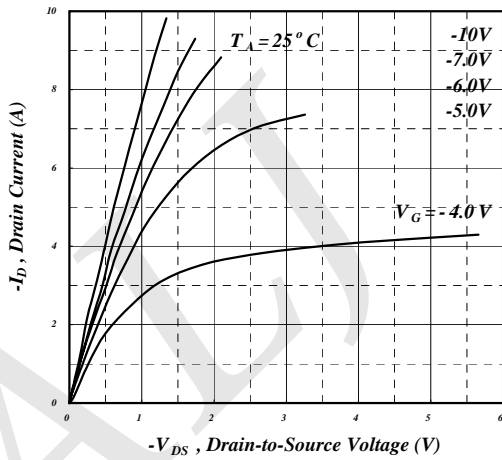


Fig 1. Typical Output Characteristics

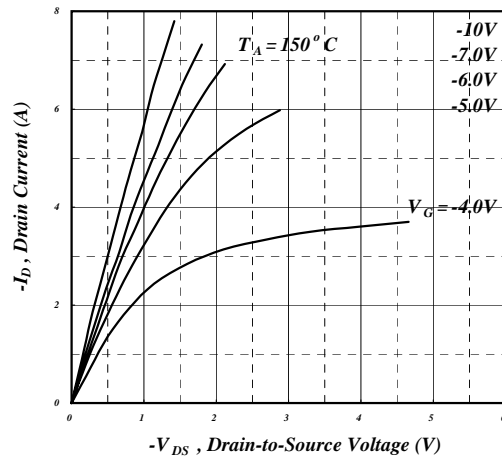


Fig 2. Typical Output Characteristics

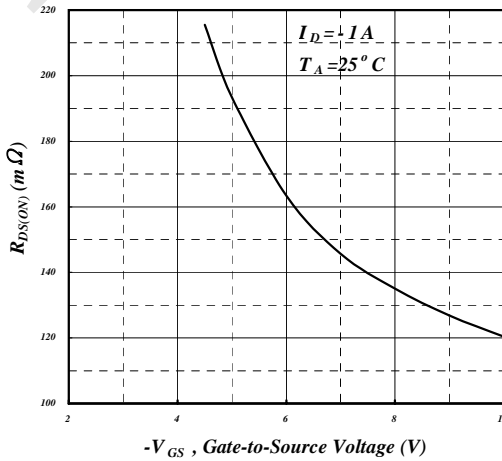


Fig 3. On-Resistance v.s. Gate Voltage

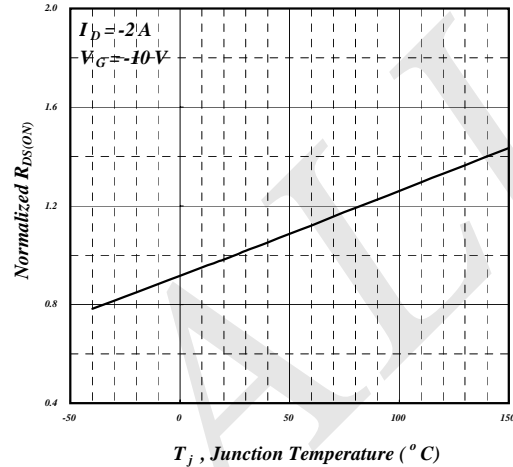


Fig 4. Normalized On-Resistance v.s. Junction Temperature

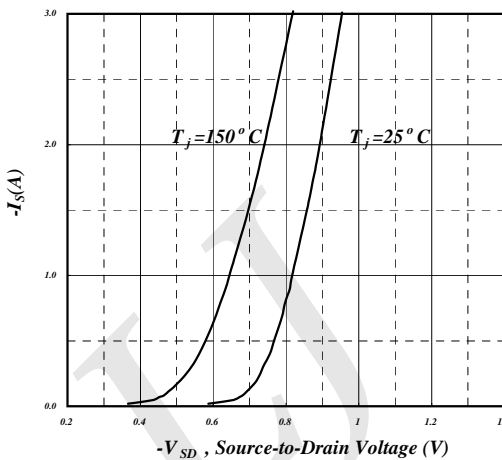


Fig 5. Forward Characteristic of Reverse Diode

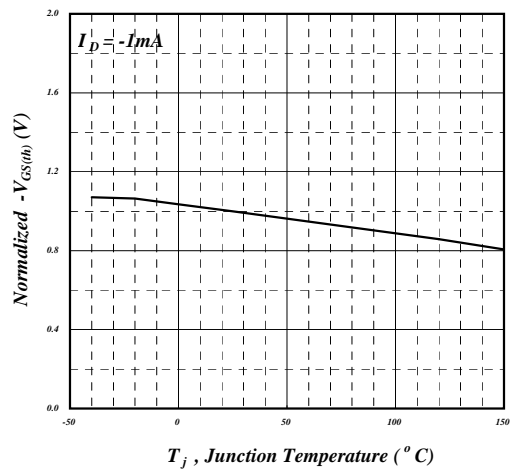


Fig 6. Gate Threshold Voltage v.s. Junction Temperature

P-Channel Typical Characteristics

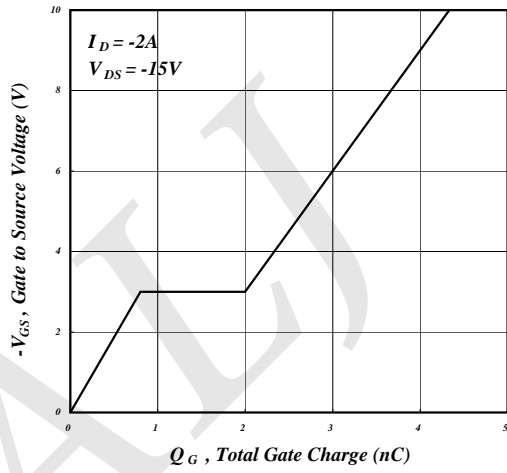


Fig 7. Gate Charge Characteristics

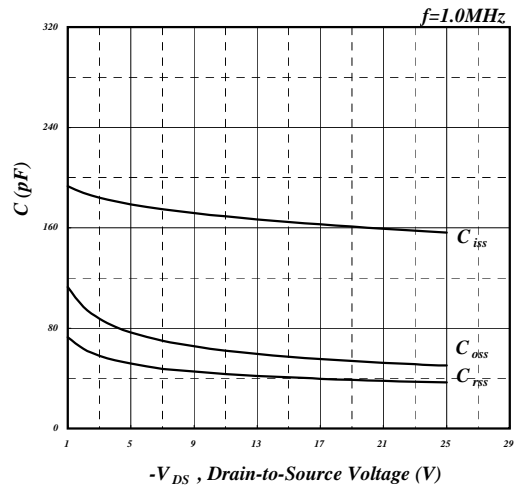


Fig 8. Typical Capacitance Characteristics

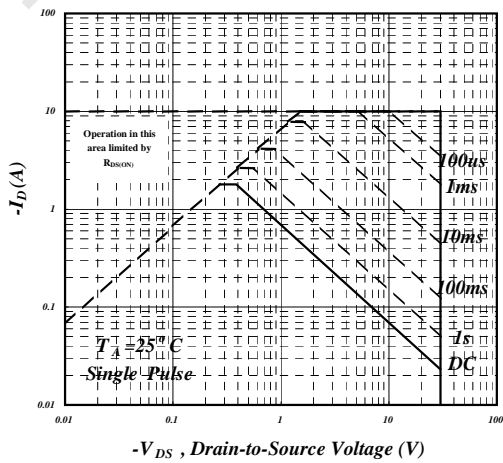


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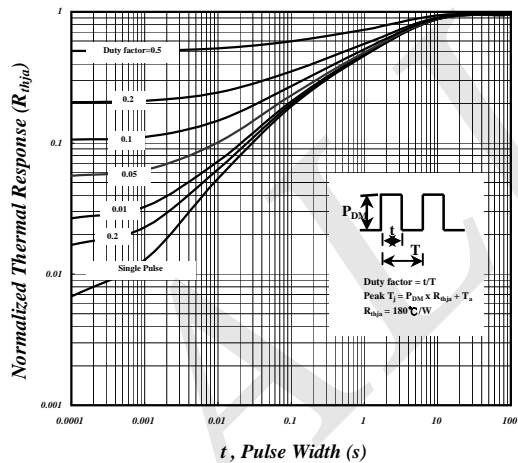


Fig 10. Effective Transient Thermal Impedance

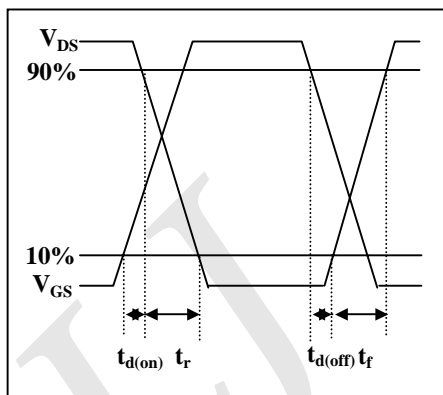


Fig 11. Switching Time Waveform

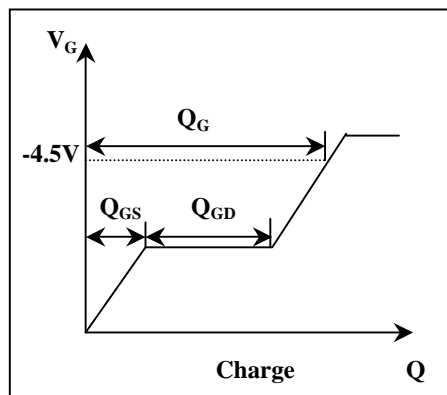


Fig 12. Gate Charge Waveform