

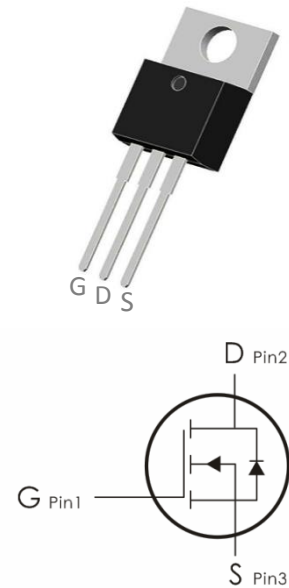
Description:

This N-Channel MOSFET uses advanced trench technology and design to provide excellent $R_{DS(on)}$ with low gate charge.

It can be used in a wide variety of applications.

Features:

- 1) $V_{DS}=100V, I_D=60A, R_{DS(ON)} < 17.5 \text{ m}\Omega @ V_{GS}=10V$
- 2) Low gate charge.
- 3) Green device available.
- 4) Advanced high cell density trench technology for ultra $R_{DS(ON)}$.
- 5) Excellent package for good heat dissipation.



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

Symbol	Parameter	Ratings	Units
V_{DS}	Drain-Source Voltage	100	V
V_{GS}	Gate-Source Voltage	± 20	V
I_D	Continuous Drain Current- $T_C=25^\circ\text{C}$	60	A
	Continuous Drain Current- $T_C=100^\circ\text{C}$	40	
I_{DM}	Pulsed Drain Current	160	
E_{AS}	Single Pulse Avalanche Energy ⁵	580	mJ
P_D	Power Dissipation	160	W
T_J, T_{STG}	Operating and Storage Junction Temperature Range	-55 to +150	$^\circ\text{C}$

Thermal Characteristics:

Symbol	Parameter	Max	Units
$R_{\theta JC}$	Thermal Resistance, Junction to Case ²	0.94	$^\circ\text{C}/\text{W}$

Package Marking and Ordering Information:

Part NO.	Marking	Package
DOP60N10	60N10	TO-220

Electrical Characteristics: ($T_C=25^{\circ}\text{C}$ unless otherwise noted)

Symbol	Parameter	Conditions	Min	Typ	Max	Units
Off Characteristics						
BV _{DSS}	Drain-Sourctce Breakdown Voltage	V _{GS} =0V, I _D =250 μ A	100	110	---	V
I _{DSS}	Zero Gate Voltage Drain Current	V _{GS} =0V, V _{DS} =100V	---	---	1	μ A
I _{GSS}	Gate-Source Leakage Current	V _{GS} =± 20V, V _{DS} =0A	---	---	± 100	nA
On Characteristics						
V _{GS(th)}	GATE-Source Threshold Voltage ³	V _{GS} =V _{DS} , I _D =250 μ A	2	3	4	V
R _{DS(ON)}	Drain-Source On Resistance ³	V _{GS} =10V, I _D =28A	---	14.5	17.5	m Ω
Dynamic Characteristics						
C _{iss}	Input Capacitance ⁴	V _{DS} =25V, V _{GS} =0V, f=1MHz	---	3968	---	pF
C _{oss}	Output Capacitance ⁴		---	182.4	---	
C _{rss}	Reverse Transfer Capacitance ⁴		---	160	---	
Switching Characteristics						
t _{d(on)}	Turn-On Delay Time ⁴	V _{DD} =30V, I _D =2A, R _{GEN} =2.5 Ω .V _{GS} =10V	---	16	---	ns
t _r	Rise Time ⁴		---	12	---	ns
t _{d(off)}	Turn-Off Delay Time ⁴		---	54	---	ns
t _f	Fall Time ⁴		---	15	---	ns
Q _g	Total Gate Charge ⁴	V _{GS} =10V, V _{DS} =30V, I _D =30A	---	146	---	nC
Q _{gs}	Gate-Source Charge ⁴		---	29	---	nC
Q _{gd}	Gate-Drain “Miller” Charge ⁴		---	57	---	nC
Drain-Source Diode Characteristics						
V _{SD}	Source-Drain Diode Forward Voltage ³	V _{GS} =0V, I _S =28A	---	0.85	1.2	V
T _{rr}	Reverse Recovery Time	T _J =25℃, I _{sd} =28A, V _{GS} =0V	---	35	---	NS
Q _{rr}	Reverse Recovery Charge	di/dt=500A/μs	---	58	---	NC
I _s	Continuous Drain Current ²	VD=VG=0V	---	60	---	A
I _{SM}	Pulsed Drain Current		---	160	---	A

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 $\leq 300\mu\text{s}$, Duty Cycle $\leq 2\%$.
4. Guaranteed by design, not subject to production
5. EAS condition: $T_J=25^\circ\text{C}$, $V_{DD}=50\text{V}$, $V_G=10\text{V}$, $R_g=25\Omega$, $L=1\text{mH}$, $I_{AS}=35\text{A}$

Typical Characteristics: ($T_C=25^\circ\text{C}$ unless otherwise noted)

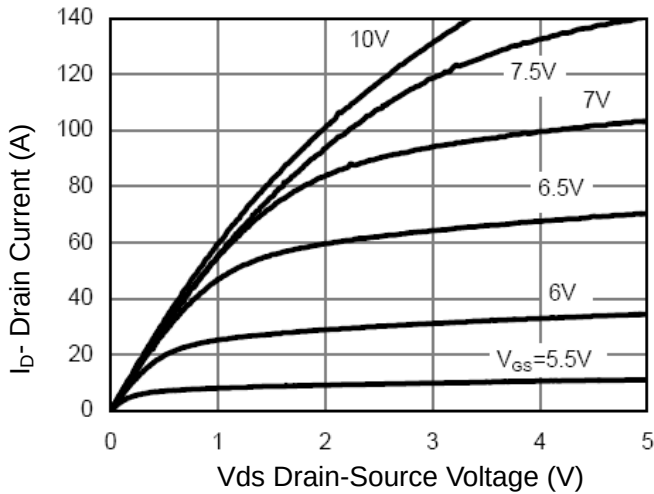


Figure 1 Output Characteristics

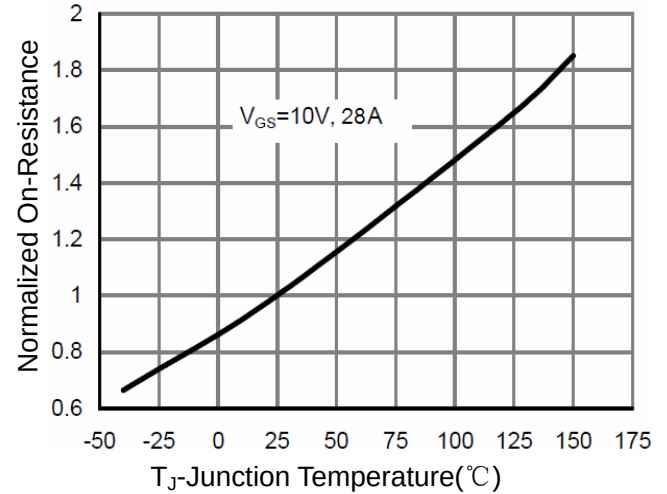


Figure 4 $R_{DS(on)}$ -Junction Temperature

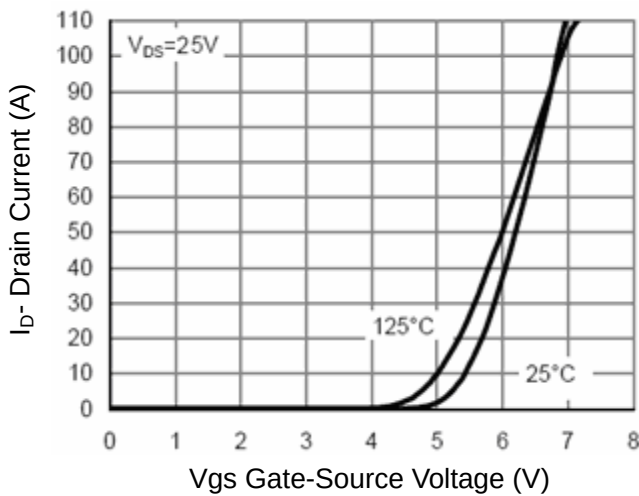


Figure 2 Transfer Characteristics

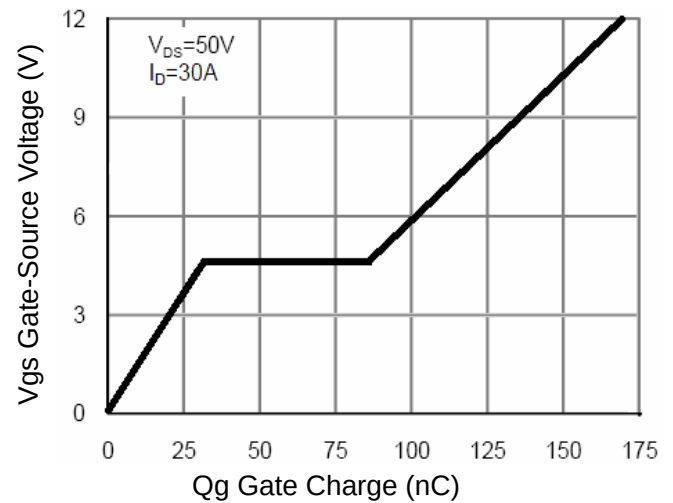


Figure 5 Gate Charge

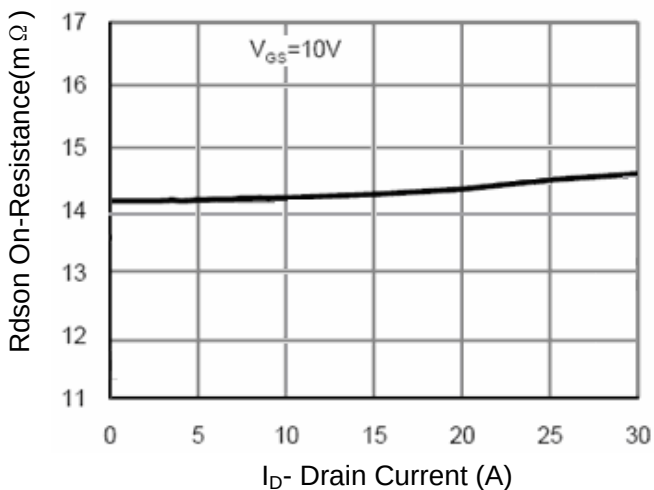


Figure 3 $R_{DS(on)}$ - Drain Current

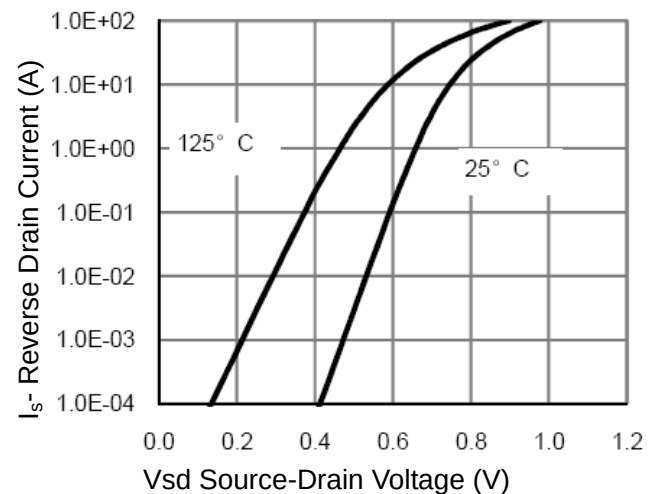


Figure 6 Source- Drain Diode Forward

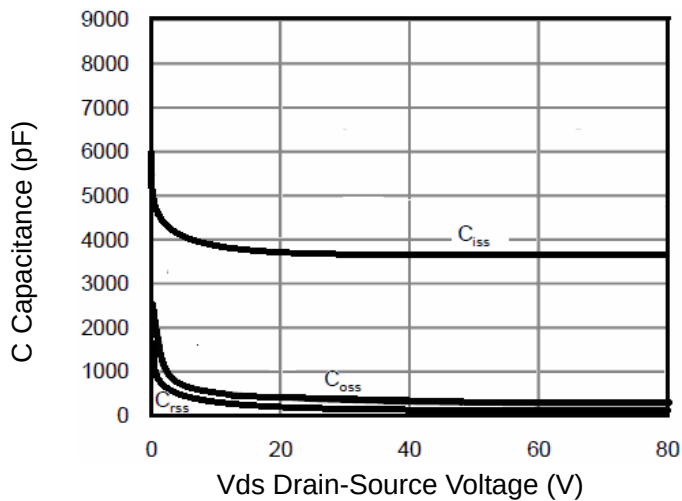


Figure 7 Capacitance vs Vds

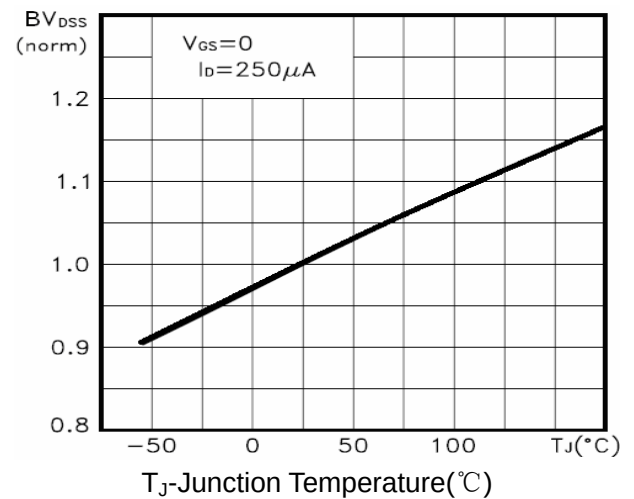


Figure 9 BV_{DSS} vs Junction Temperature

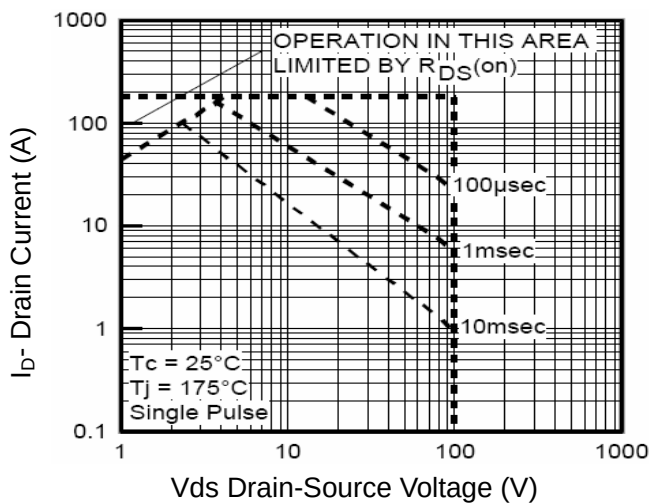


Figure 8 Safe Operation Area

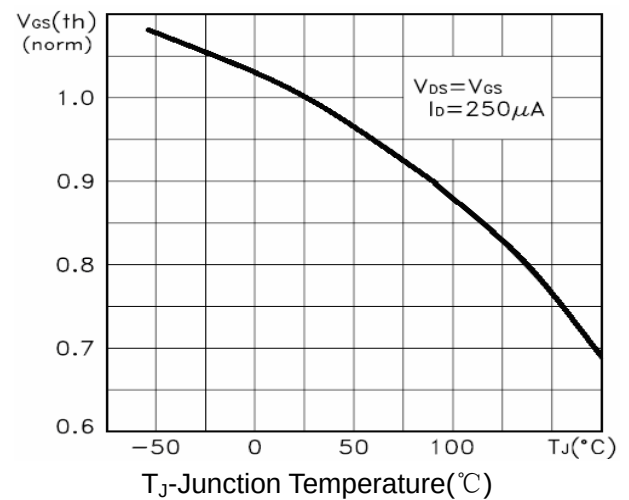


Figure 10 $V_{GS(th)}$ vs Junction Temperature

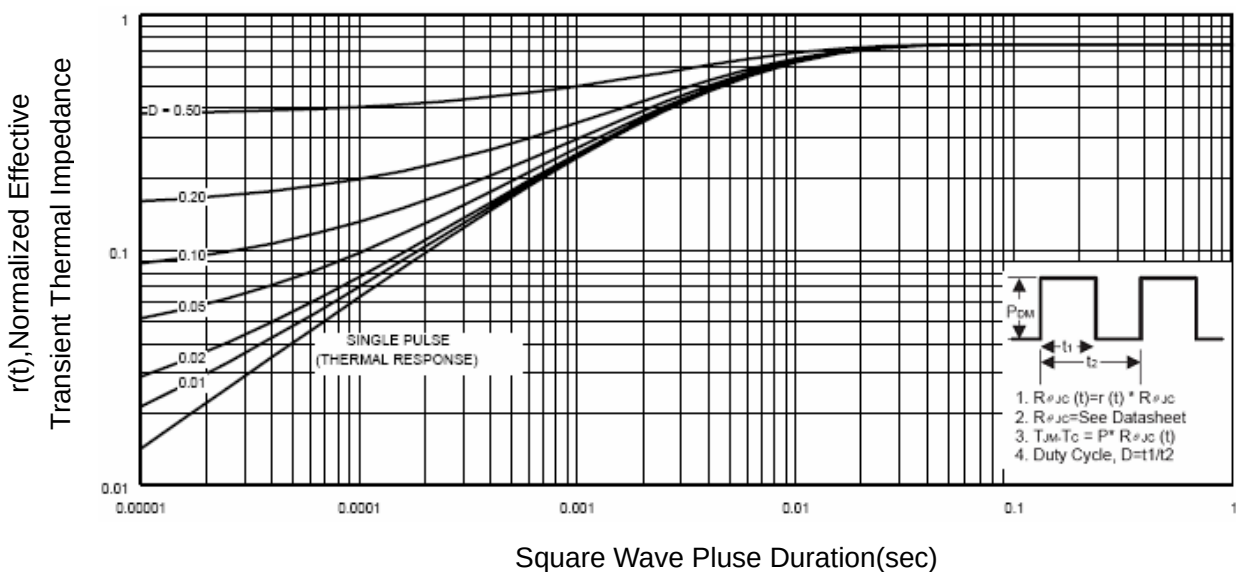


Figure 11 Normalized Maximum Transient Thermal Impedance