

300V N-Channel Power MOSFET

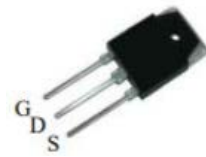
DESCRIPTION :

- Advanced Planar Process
- Low Gate Charge Minimize Switching Loss
- Rugged Poly silicon Gate Structure
- $R_{DS(ON),typ.}=40m\Omega@V_{GS}=10V$
- RoHS compliant

BV_{DSS}	300V
I_D	69A
$R_{DS(ON) typ.}$	40m Ω

TYPICAL APPLICATIONS :

- BLDC Motor Driver
- Electric Welder
- High Efficiency SMPS



TO-3P

MAXIMUM RATINGS (at $T_C = 25\text{ }^\circ\text{C}$, unless otherwise specified)

Characteristic	Condition	Symbol	Value	Unit
Drain-Source Voltage		V_{DSS}	300	V
Gate-Source Voltage		V_{GSS}	± 30	V
Continuous Drain Current	$T_C=25^\circ\text{C}$ $T_C=100^\circ\text{C}$	I_D	69 42	A
Pulsed Drain Current ⁽¹⁾	$V_{GS}=10V$	I_{DM}	276	A
Single Pulsed Avalanche Energy		E_{AS}	4494	mJ
Peak Diode Recovery dv/dt		dv/dt	5.0	V/ns
Power dissipation	$T_C=25^\circ\text{C}$	P_D	520	W
Junction & Storage temperature Range		T_J, T_{STG}	-55~+150	$^\circ\text{C}$

Notes : 1. Repetitive rating; pulse width limited by maximum junction temperature.

THERMAL CHARACTERISTICS

Characteristic	Condition	Symbol	Value	Unit
Thermal resistance,	Junction – Ambient Junction - Case	$R_{\theta JA}$ $R_{\theta JC}$	50 0.24	$^\circ\text{C/W}$

ELECTRICAL CHARACTERISTICS (at $T_J = 25\text{ }^\circ\text{C}$, unless otherwise specified)

Characteristic	Symbol	Min.	Typ.	Max.	Unit
Drain-Source Breakdown Voltage VGS = 0V, ID = 250uA	BV _{DSS}	300			V
Zero Gate Voltage Drain Current VDS = 300 V, VGS = 0 V Tj=25°C	I _{DSS}			1	uA
Gate-Source Leakage Current VGS = ±20V, VDS = 0V	I _{GSS}			±100	nA
Gate-Source threshold voltage VDS = VGS, ID = 250uA	V _{GS(th)}	2.0		4.0	V
Drain-Source On-State Resistance VGS = 10V, ID = 35A	R _{DS(on)}		40	52	mΩ
Forward Transconductance VDS = 15V, ID = 30A	G _{FS}		55		S
Input capacitance f=1MHz, VDS=25 V, VGS=0 V	C _{iss}		5790		pF
Output capacitance f=1MHz, VDS=25 V, VGS=0 V	C _{oss}		810		pF
Reverse transfer capacitance f=1MHz, VDS=25 V, VGS=0 V	C _{rss}		453		pF
Total Gate Charge VDD= 150V, ID= 69A,VGS= 0 to 10V	Q _G		377		nC
Gate to Source Charge VDD= 150V, ID= 69A,VGS= 0 to 10V	Q _{GS}		26		nC
Gate to Drain Charge VDD= 150V, ID= 69A,VGS= 0 to 10V	Q _{GD}		208		nC
Turn-on delay time VDD=150 V, VGS= 10V, ID= 35A, R _{GEN} =10Ω	td _(ON)		41		ns
Turn-on Rise time VDD=150 V, VGS= 10V, ID= 35A, R _{GEN} =10Ω	tr		205		ns
Turn-off delay time VDD=150 V, VGS= 10V, ID= 35A, R _{GEN} =10Ω	td _(OFF)		520		ns
Turn-off Fall time VDD=150 V, VGS= 10V, ID= 35A, R _{GEN} =10Ω	tf		182		ns

Body Diode

ELECTRICAL CHARACTERISTICS (at $T_J = 25\text{ }^\circ\text{C}$, unless otherwise specified)

Characteristic	Symbol	Min.	Typ.	Max.	Unit
Diode Forward Voltage $V_{GS} = 0V, I_S = 69A$	V_{SD}			1.5	V
Continuous Source Current	I_{SD}			69	A
Revers Recovery Time $V_{GS} = 0V, I_F = 69A, dI_F/dt = 100A/\mu s$	T_{rr}		611		ns
Revers Recovery Charge $V_{GS} = 0V, I_F = 69A, dI_F/dt = 100A/\mu s$	Q_{rr}		5904		nC

Typical Characteristics

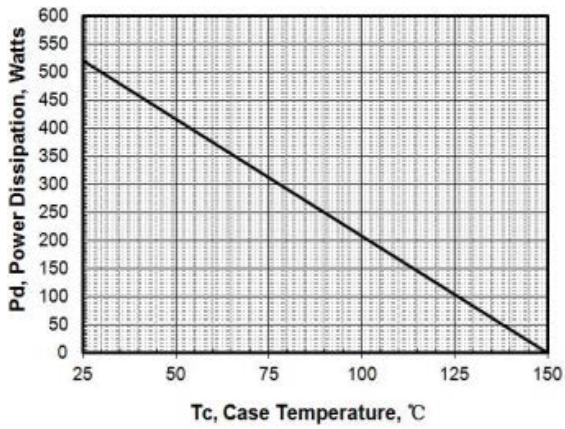


Figure 1. Max. Power Dissipation vs. Case Temperature

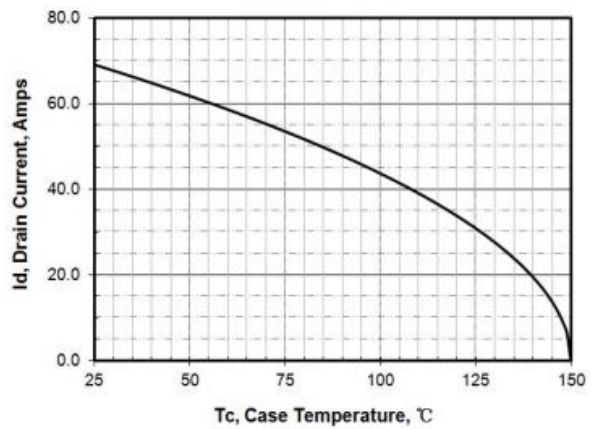


Figure 2. Max. Continuous Current vs TC

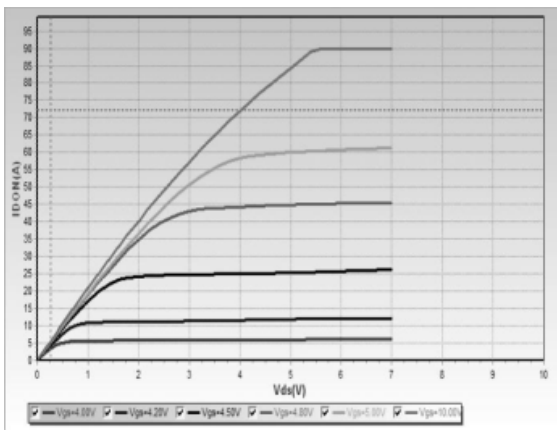


Figure 3 Output Characteristics

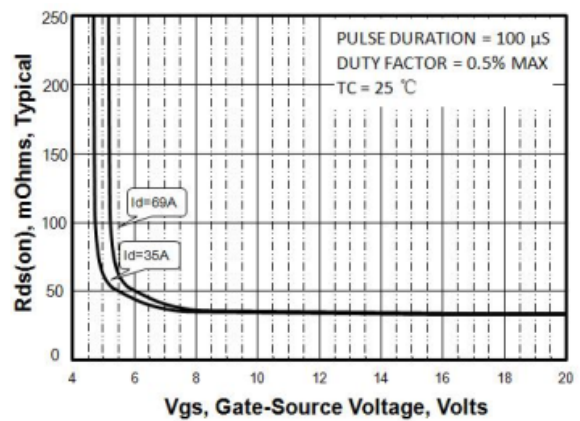


Figure 4. Rds(on) vs. Gate Voltage

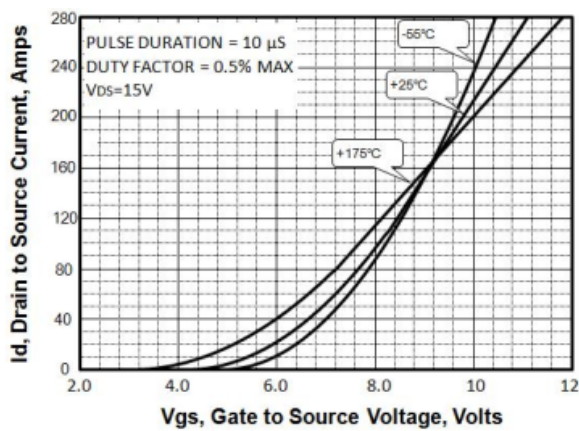


Figure 5. Transfer Characteristics

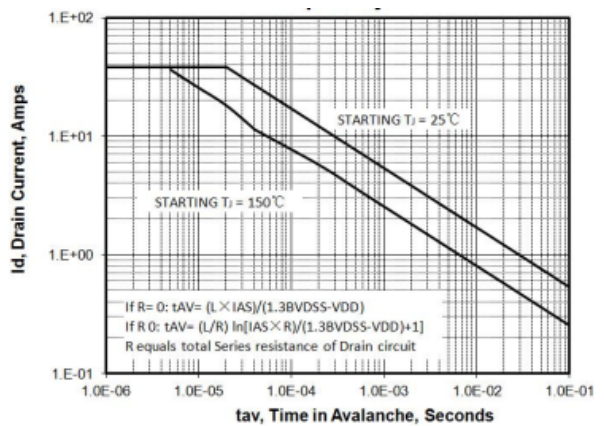


Figure 6. Unclamped Inductive Switching Capability

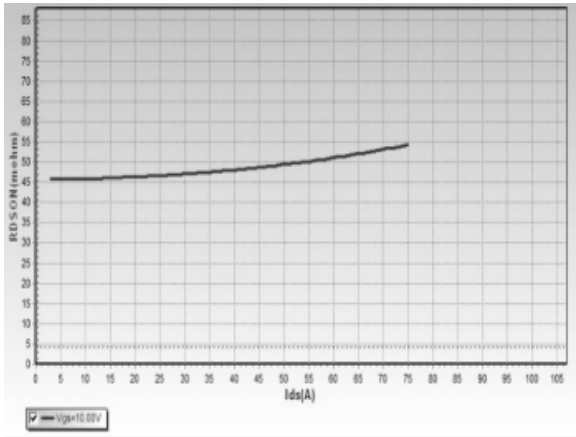


Figure 7. Drain to Source ON Resistance vs Drain Current

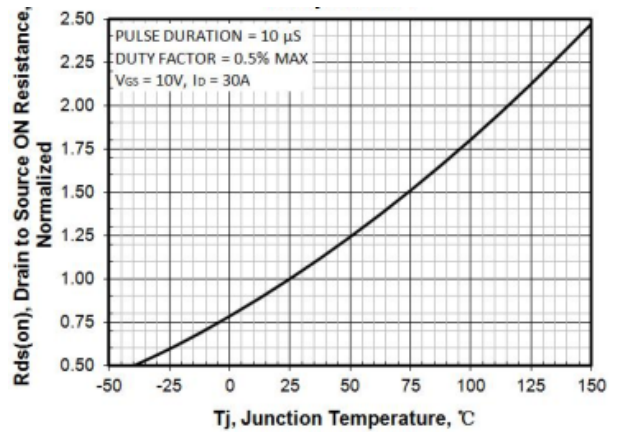


Figure 8. Rds(on) vs Junction Temperature

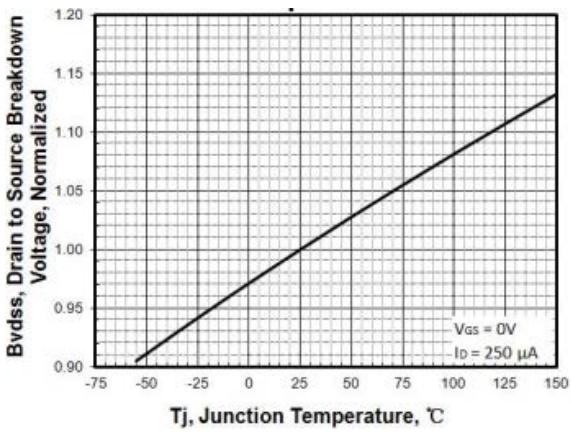


Figure 9. Breakdown Voltage vs Temperature

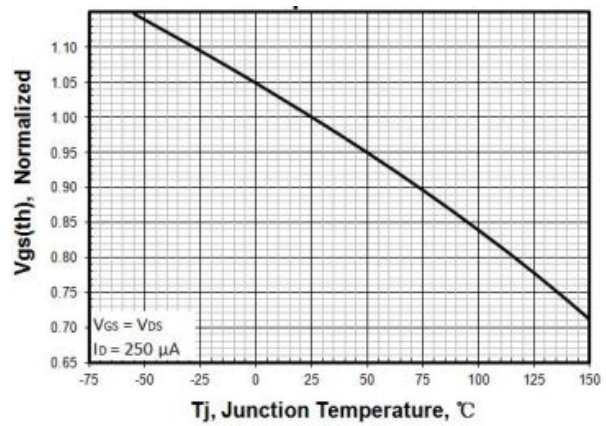


Figure 10. Threshold Voltage vs Temperature

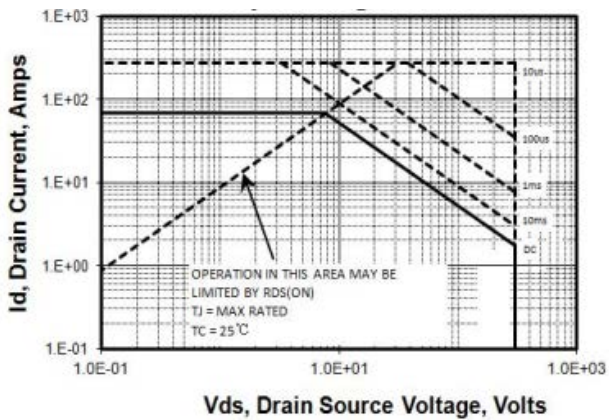


Figure 11. Max. Safe Operating Area

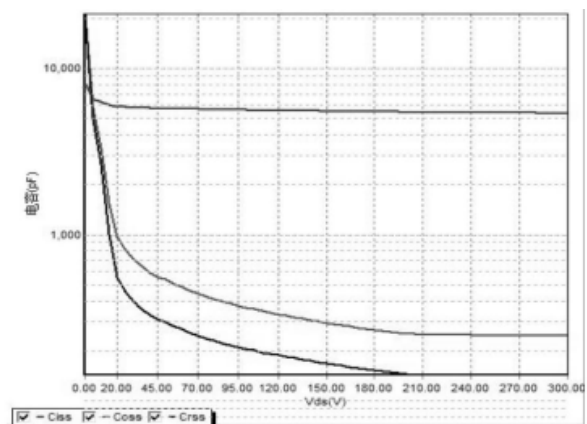


Figure 12. Capacitance vs Vds

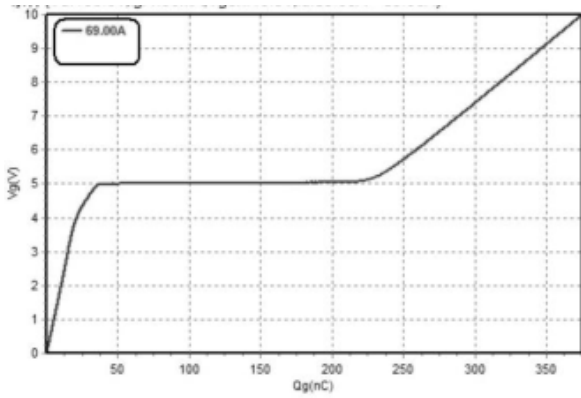


Figure 13. Typical Gate Charge

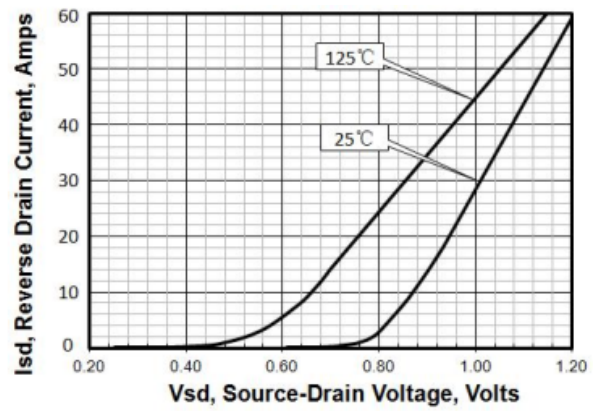


Figure 14. Body Diode Transfer Characteristics

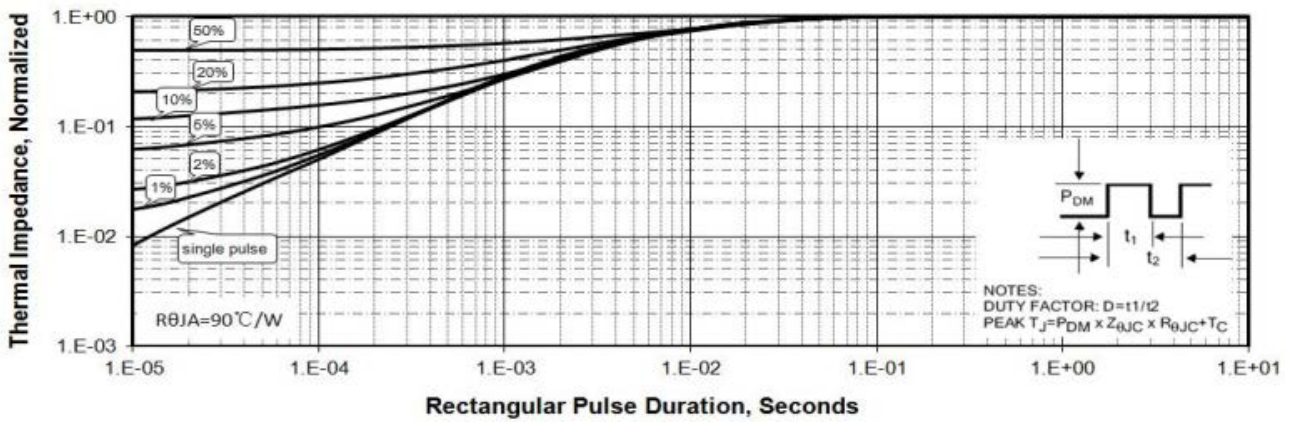


Figure 15. Max. Transient Thermal Impedance

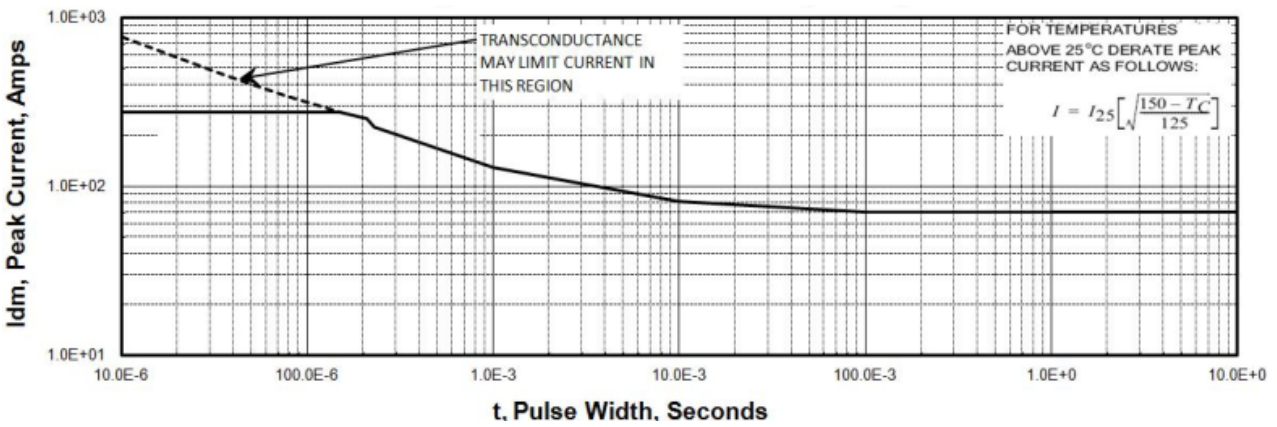
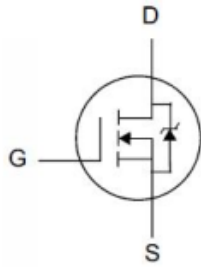


Figure 16. Peak Current Capability

- Circuit diagram



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