120V N-Channel Power MOSFET

DESCRIPTION：

·Low On-Resistance

·Excellent FoM (figure of merit)

·100% ΔVDS & UIS & Rg Tested

·AEC-Q101 Qualified, PPAP Capable

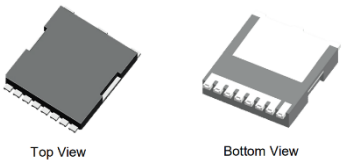
V_{DS}	120V
I_D	395A
$R_{DS(ON)_Typ.}$ @V_{GS}=10V	1.4mΩ

TYPICAL APPLICATIONS：

·Motor Drives

·High-Performance Power Supplies

·Hard Switching and High Speed Circuit



TOLL

MAXIMUM RATINGS (at T_C = 25 °C, unless otherwise specified)

Characteristic	Condition	Symbol	Value	Unit
Drain - Source Voltage		V_{DS}	120	V
Gate-Source Voltage		V_{GS}	±20	V
Continuous Drain Current(1)	Tc=25℃ Tc=100℃	I_D	395 279	A
Pulsed Drain Current (2)		I_{DM}	1578	A
Single Pulsed Avalanche Energy (3)		E_{AS}	2190	mJ
Single Pulse Avalanche Current	L= 10.0mH	I_{AS}	78	A
Power dissipation	Tc=25℃ Tc=100℃	P_D	500 250	W
Junction & Storage temperature Range		T_J, T_{STG}	-55~+175	℃

Notes： 1. This current is chip limited, which is calculated based on Rthjc..
2. This current is calculated on single pulse with 10μs Pulse & Duty Cycle = 1%
3. Defined by design, not subject to production test, EAS condition: TJ=25°C, VDD=60V, VGS=10V, L=1.0mH.

THERMAL CHARACTERISTICS

Characteristic	Condition	Symbol	Value	Unit
Thermal resistance,	Junction to Ambient Junction to Case	$R_{\theta JA}$ $R_{\theta JC}$	25 0.30	℃/W

ELECTRICAL CHARATERISTICS (at T_J = 25 °C, unless otherwise specified)

Characteristic	Symbol	Min.	Typ.	Max.	Unit
Drain-Source Breakdown Voltage VGS = 0V, ID = 250uA	$V_{(BR)DSS}$	120			V
Zero Gate Voltage Drain Current VDS = 120 V, VGS = 0 V ,Tj=25℃ VDS = 120 V, VGS = 0 V ,Tj=125℃	I_{DSS}			1.0 100	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	3.0	4.0	V
Drain-Source On-State Resistance VGS = 10V, ID = 80A	$R_{DS(on)}$		1.4	1.7	mΩ
Forward Transconductance VDS = 5.0V, ID = 20A	gfs		81		S
Diode Forward Voltage VGS = 0V, I_{SD} =2.0A	V_{SD}		0.7	1.2	V
Gate Resistance f=1MHz	R_g		1.7		Ω
Input capacitance f=1MHz, VDS=60 V, VGS=0 V	C_{iss}		10486		pF
Output capacitance f=1MHz, VDS=60 V, VGS=0 V	C_{oss}		3850		pF
Reverse transfer capacitance f=1MHz, VDS=60 V, VGS=0 V	C_{rss}		39		pF
Turn-on delay time VDS=60 V, ID=80A, VGS=10V, R_{GEN}=3.0Ω	td (ON)		22		ns
Rise time VDS=60 V, ID=80A, VGS=10V, R_{GEN}=3.0Ω	tr		29		ns
Turn-off delay time VDS=60 V, ID=80A, VGS=10V, R_{GEN}=3.0Ω	td (OFF)		72		ns
Fall time VDS=60 V, ID=80A, VGS=10V, R_{GEN}=3.0Ω	tf		30		ns
Total Gate Charge VDS= 60V, ID= 80A, VGS= 10V VDS= 60V, ID= 80A, VGS= 7.0V	Q_G		138 99		nC
Gate to Source Charge VDS= 60V, ID= 80A, VGS= 10V	Q_{GS}		48		nC
Gate to Drain Charge VDS= 60V, ID= 80A, VGS= 10V	Q_{GD}		23		nC
Gate Plateau Voltage VDS= 60V, ID= 80A, VGS= 10V	$V_{plateau}$		4.9		nC
Revers Recovery Time I_F =80A, di_F/dt = 100A/us ,Tj=25℃	Trr		65		ns
Revers Recovery Charge I_F =80A, di_F/dt = 100A/us ,Tj=25℃	Qrr		103		uC
Peak Reverse Recovery Current I_F =80A, di_F/dt = 100A/us ,Tc=25℃	IS			395	A

Typical Performance Characteristics

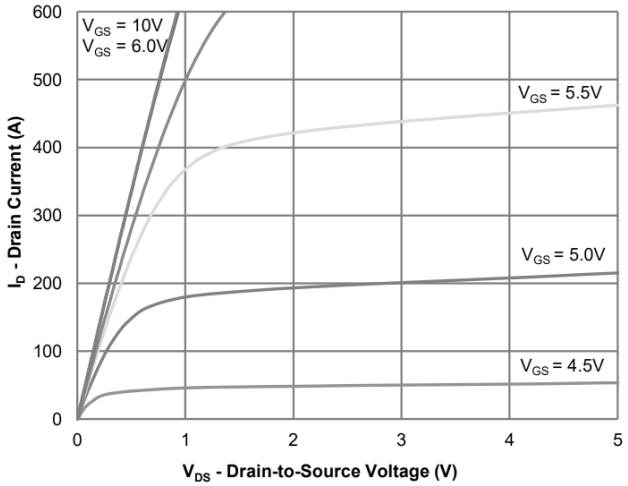


Figure 1. Output Characteristics

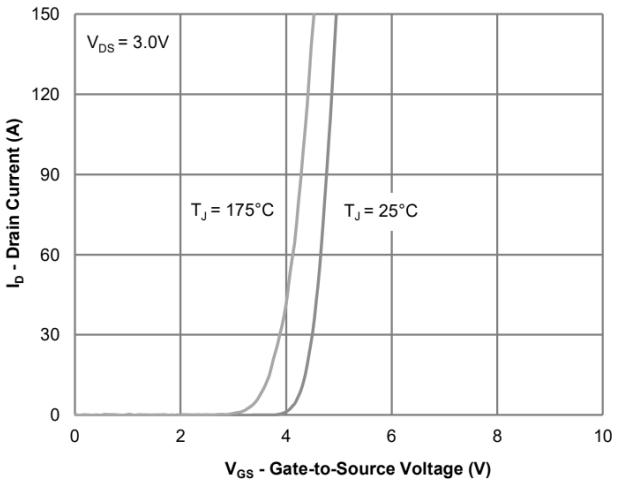


Figure 2. Transfer Characteristics

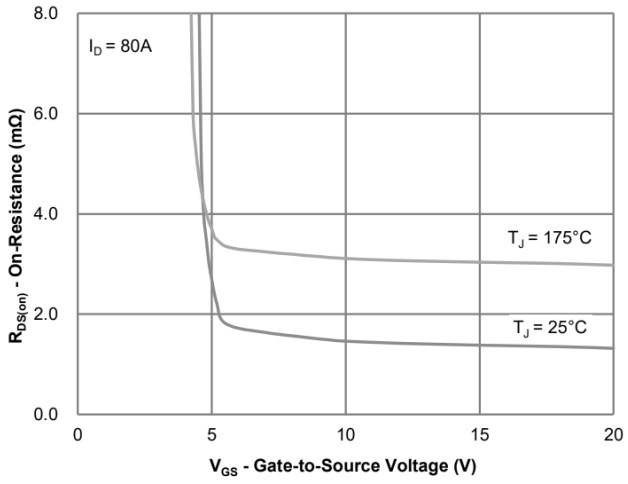


Figure 3. On-Resistance vs. Gate-Source Voltage

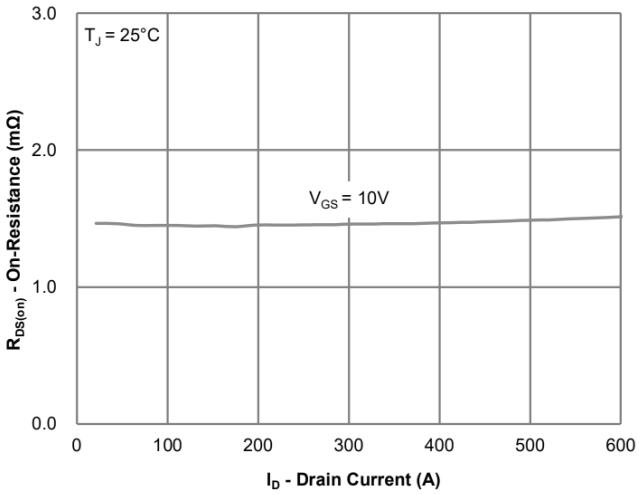


Figure 4. On-Resistance vs. Drain Current and Gate Voltage

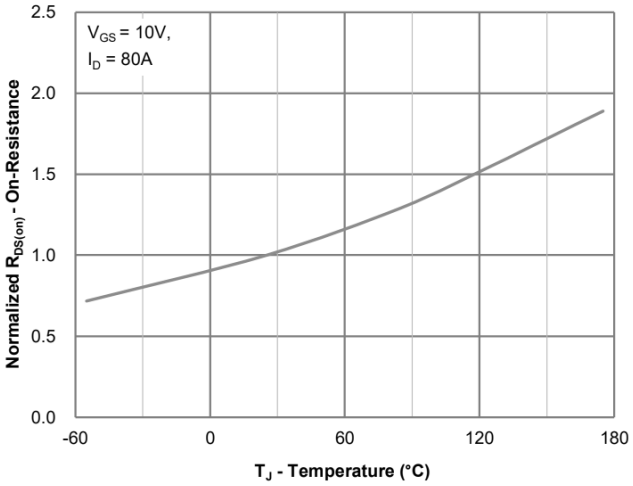


Figure 5. On-Resistance vs. Junction Temperature

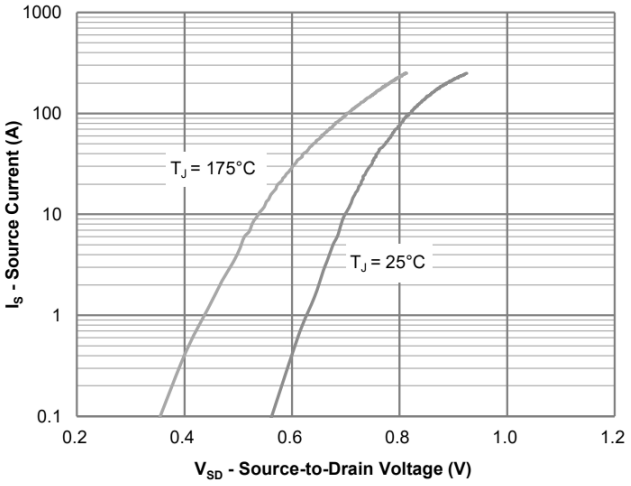


Figure 6. Source-Drain Diode Forward Voltage

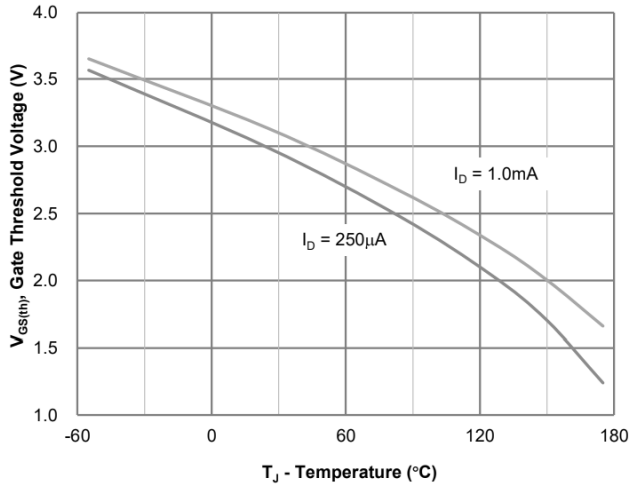


Figure 7. Gate Threshold Variation vs. Junction Temperature

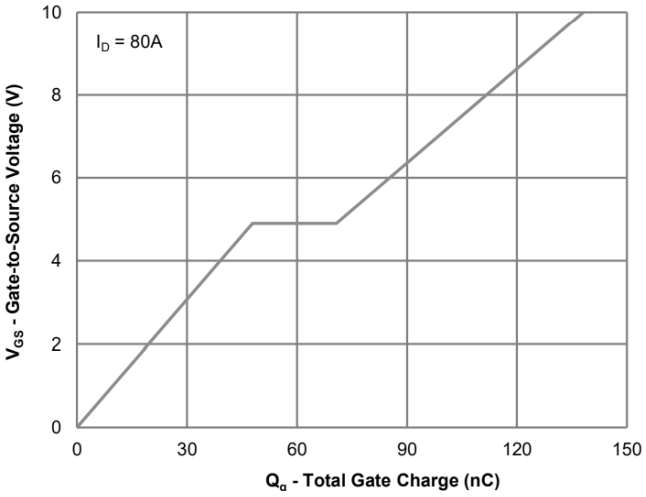


Figure8. Gate Charge Characteristics

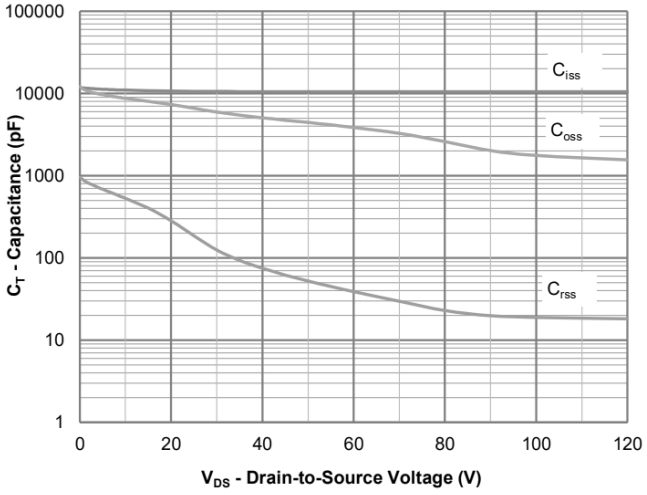


Figure 9. Capacitance Characteristics

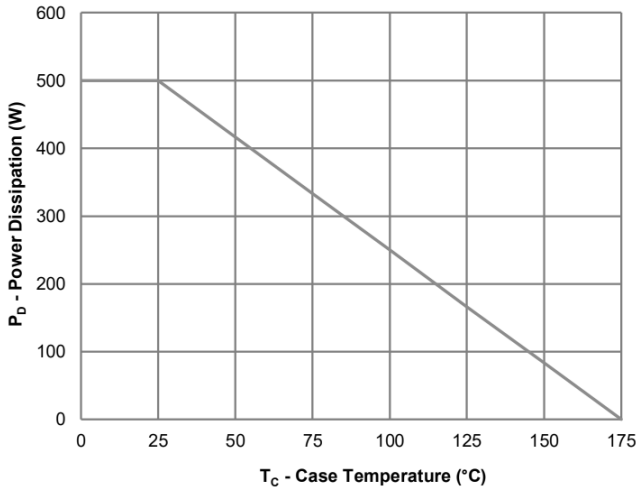


Figure 10. Power Derating

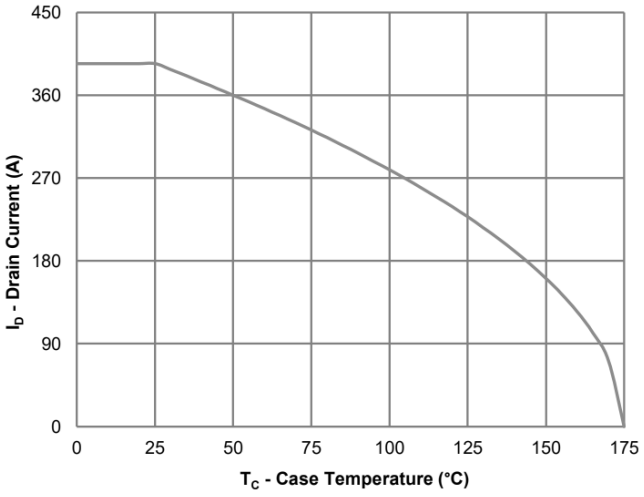


Figure 11. Current Derating

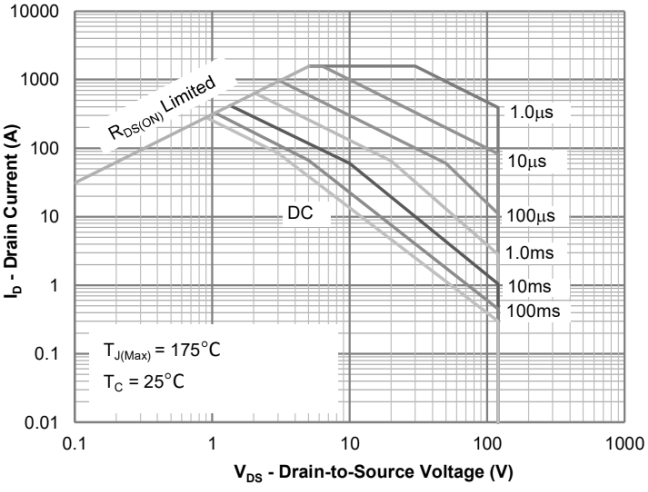


Figure 12. Safe Operating Area

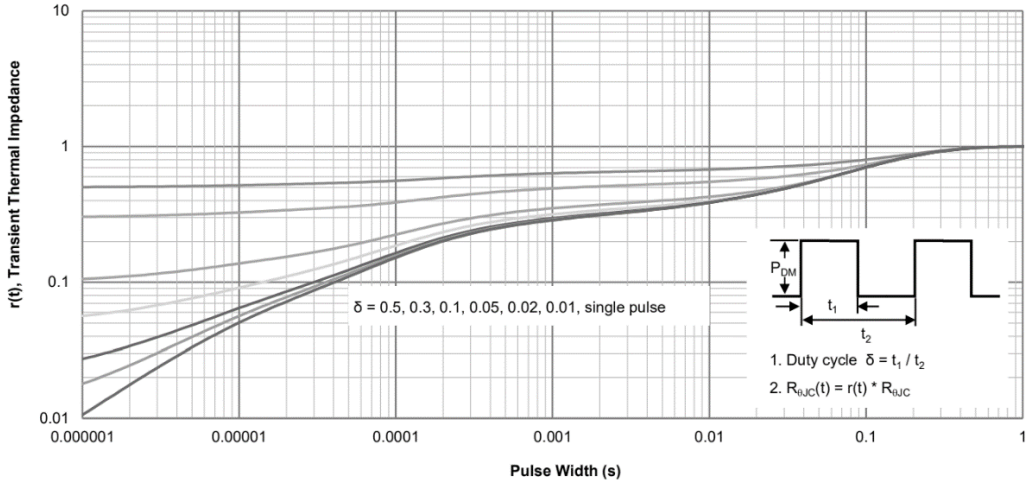
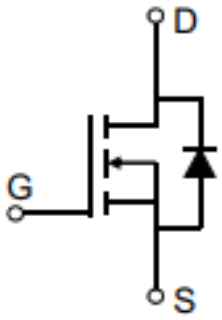
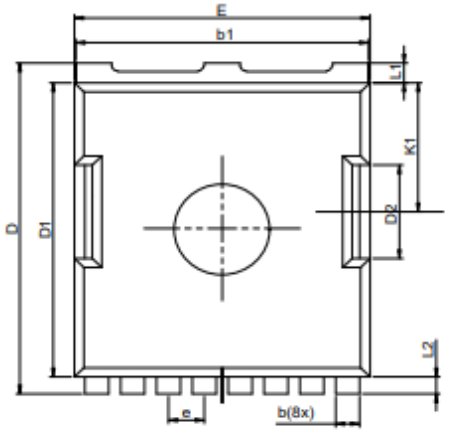


Figure 13. Normalized Maximum Transient Thermal Impedance

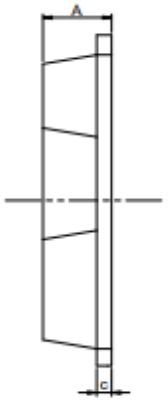
·Circuit diagram



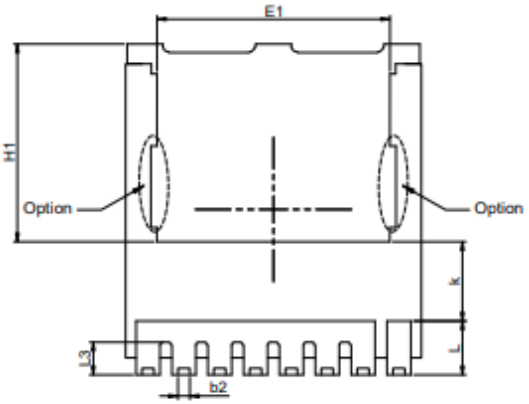
·Package outlines : Dimensions in (mm)



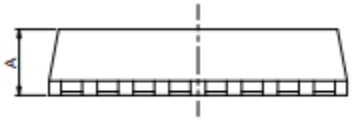
Top View



Side View



Bottom View



Front View

DIM.	MILLIMETER		
	MIN.	NOM.	MAX.
A	2.200	2.300	2.400
b	0.650	0.800	0.900
b1	9.650	9.800	9.950
b2		0.400 REF	
c	0.400	0.500	0.600
D	11.480	11.680	11.950
D1	10.250	--	10.700
D2	2.850	--	3.400
E	9.700	9.900	10.100
E1	8.000	--	9.250
e		1.200 BSC	
H1	6.700	7.000	7.300
k		3.000 REF	
k1		4.550 REF	
L	1.350	--	2.100
L1		0.700 REF	
L2		0.600 REF	
L3	0.950	1.200	1.350

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