

■ PRODUCT CHARACTERISTICS

VDSS	30V
$R_{DS(on)Typ}(V_{GS}=10V)$	3.2mΩ
$R_{DS(on)Typ}(V_{GS}=4.5V)$	5mΩ
ID	120A

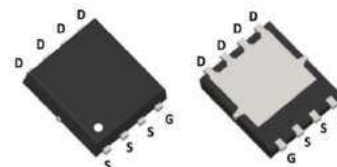
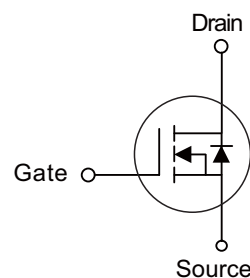
■ APPLICATIONS

- * Power switching application
- * Hard switched and high frequency circuits
- * Uninterruptible power supply

■ FEATURES

- * High density cell design for ultra low $R_{DS(on)}$
- * Excellent package for good heat DISSIPATION

Symbol



■ ORDER INFORMATION

Order codes		Package	Packing
Halogen-Free	Halogen		
N/A	MOT3136J	PDFN3x3-8L	5000 pieces /Reel

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

Parameter	Symbol	Value	Unit
Drain-Source Voltage	V_{DS}	30	V
Gate-Source Voltage	V_{GS}	± 20	V
Drain Current-Continuous	I_D	120	A
Drain Current-Continuous($T_C=100^{\circ}\text{C}$)	$I_D(100^{\circ}\text{C})$	84	A
Pulsed Drain Current	I_{DM}	420	A
Maximum Power Dissipation	P_D	120	W
Single pulse avalanche energy	E_{AS}	350	mJ
Thermal Resistance, Junction-to-Case	$R_{\theta JC}$	1.25	$^{\circ}\text{C/W}$
Operating Junction and Storage Temperature Range	T_J, T_{STG}	-55 To 175	$^{\circ}\text{C}$

■ ELECTRICAL CHARACTERISTICS ($T_C=25^\circ\text{C}$, unless otherwise noted)

Parameter	Symbol	Condition	Min	Typ	Max	Unit
Off characteristics						
Drain-Source Breakdown Voltage	BV_{DSS}	$V_{GS}=0V, I_D=250\mu A$	30	-	-	V
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS}=30V, V_{GS}=0V$	-	-	1	μA
Gate-Body Leakage Current	I_{GSS}	$V_{GS}=\pm 20V, V_{DS}=0V$	-	-	± 100	nA
On characteristics						
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS}=V_{GS}, I_D=250\mu A$	1	1.5	3	V
Drain-Source On-State Resistance	$R_{DS(ON)}$	$V_{GS}=10V, I_D=20A$	-	3.2	4	m Ω
		$V_{GS}=4.5V, I_D=20A$	-	5	6	m Ω
Gate resistance	R_G	F=1.0MHz	-	1.2	-	Ω
Forward Transconductance	g_{FS}	$V_{DS}=5V, I_D=5A$	10	-	-	S
Dynamic characteristics						
Input Capacitance	C_{iss}	$V_{DS}=25V, V_{GS}=0V,$ F=1.0MHz	-	2800	-	PF
Output Capacitance	C_{oss}		-	260	-	PF
Reverse Transfer Capacitance	C_{rss}		-	240	-	PF
Switching characteristics						
Turn-on Delay Time	$t_{d(on)}$	$V_{GS}=10V, V_{DS}=20V$ $R_L=0.75\Omega, R_{GEN}=3\Omega$	-	11	-	nS
Turn-on Rise Time	t_r		-	10	-	nS
Turn-Off Delay Time	$t_{d(off)}$		-	38	-	nS
Turn-Off Fall Time	t_f	$V_{GS}=10V, V_{DS}=15V, I_D=20A$	-	11	-	nS
Total Gate Charge	Q_g		-	79	-	nC
Gate-Source Charge	Q_{gs}		-	9	-	nC
Gate-Drain Charge	Q_{gd}		-	18	-	nC
Drain-source diode characteristics						
Diode Forward Voltage	V_{SD}	$V_{GS}=0V, I_S=20A$	-	-	1.2	V
Diode Forward Current	I_S		-	-	120	A
Reverse Recovery Time	t_{rr}	$T_J = 25^{\circ}C, I_F = 20A$ $di/dt = 100A/\mu s$	-	58	-	nS
Reverse Recovery Charge	Q_{rr}		-	115	-	nC

■ TYPICAL CHARACTERISTICS

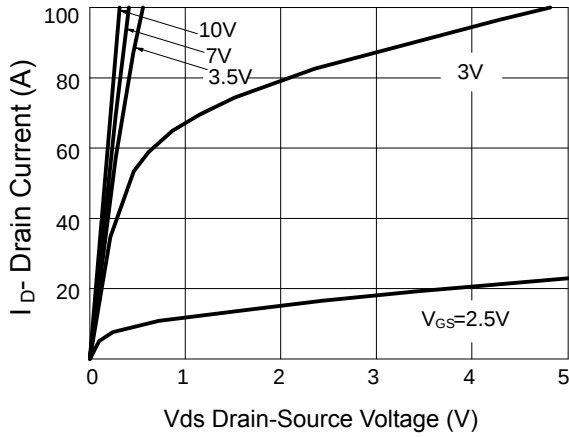


Figure 1:Output characteristics

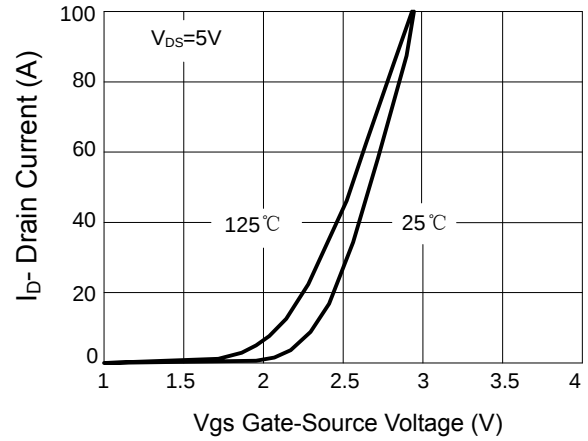


Figure 2:Transfer characteristics

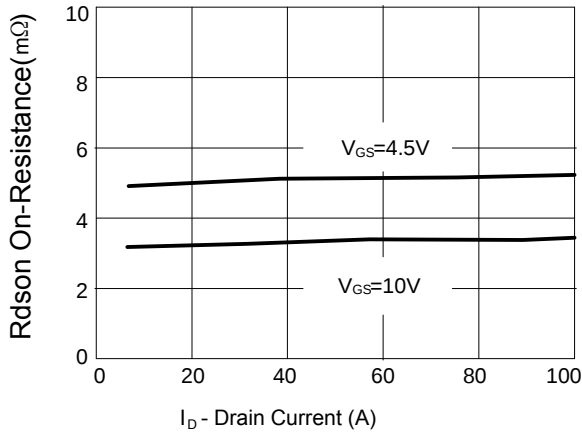


Figure 3: $R_{DS(on)}$ -drain-current

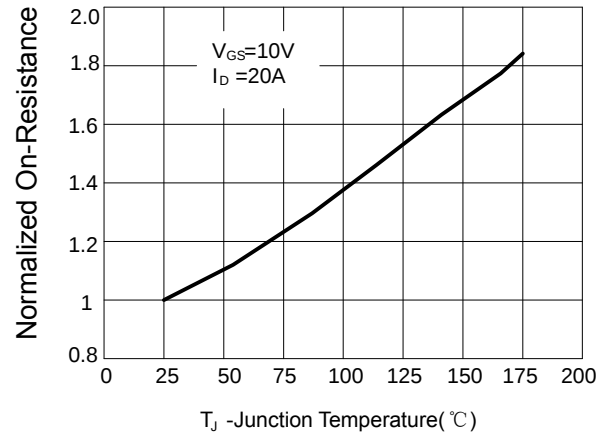


Figure 4: $R_{DS(on)}$ -junction temperature

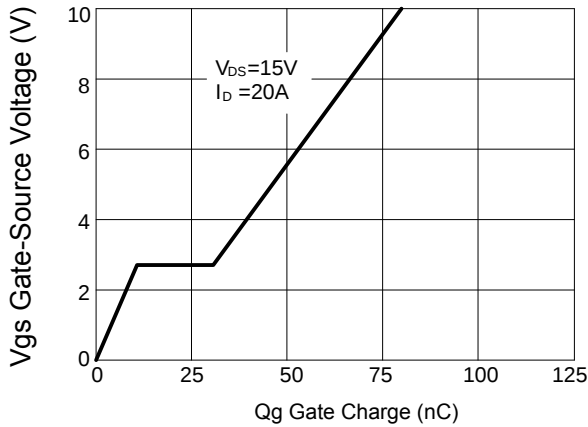


Figure 5:Gate charge

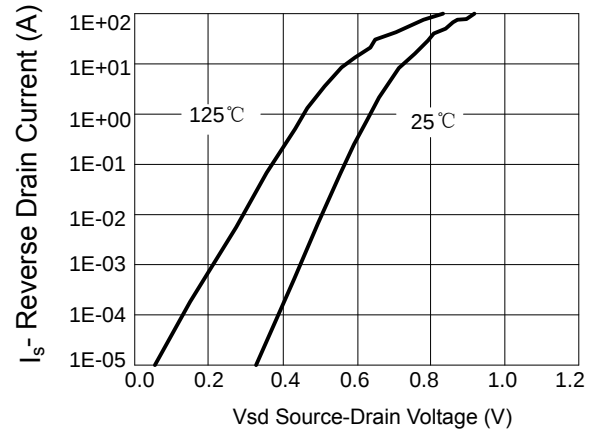


Figure 6:Source-drain diode forward

■ TYPICAL CHARACTERISTICS(Cont.)

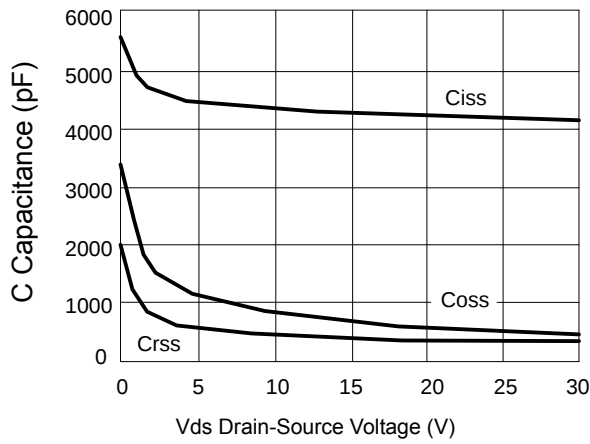


Figure 7: Capacitance vs vds

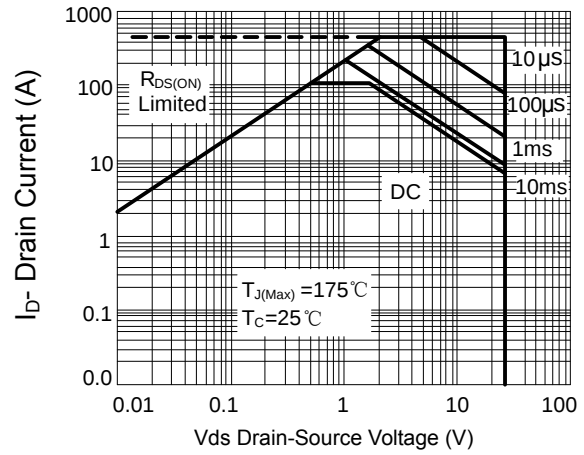


Figure 8: Safe operating area

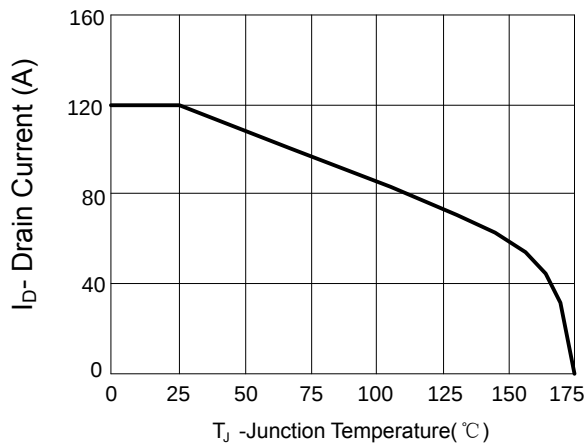


Figure 9: Current de-rating

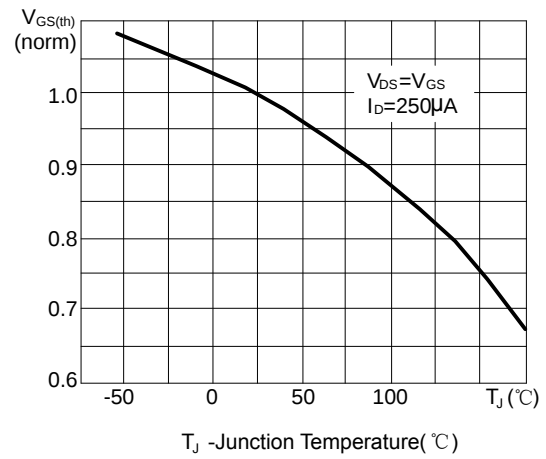
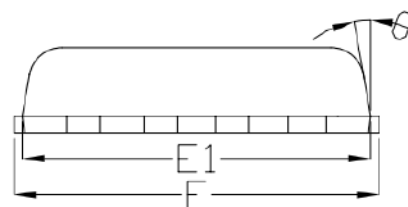
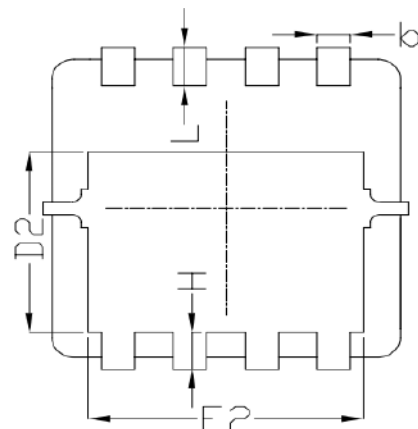
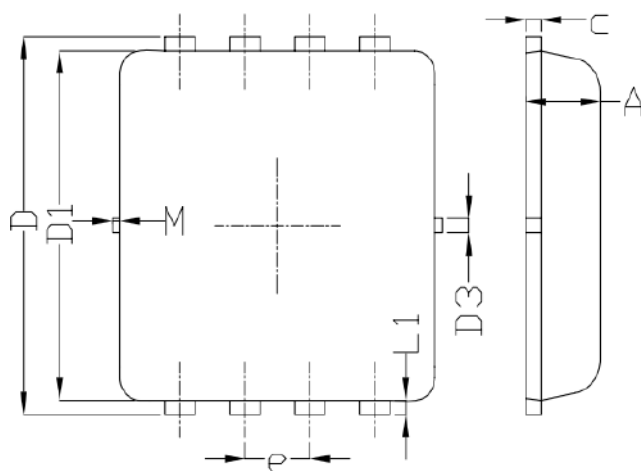
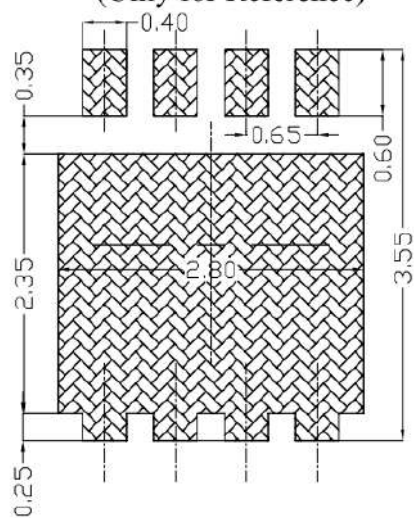


Figure 10: Vgs vs junction temperature

■ PDFN3X3-8L Package Mechanical Data



Land Pattern
(Only for Reference)



SYMBOL	DIMENSIONAL REQS		
	MIN	NOM	MAX
A	0.70	0.75	0.80
b	0.25	0.30	0.35
c	0.10	0.15	0.25
D	3.25	3.35	3.45
D1	3.00	3.10	3.20
D2	1.78	1.88	1.98
D3	---	0.13	---
E	3.20	3.30	3.40
E1	3.00	3.15	3.20
E2	2.39	2.49	2.59
e	0.65BSC		
H	0.30	0.39	0.50
L	0.30	0.40	0.50
L1	---	0.13	---
θ	---	10°	12°
M	*	*	0.15
* Not specified			