

■ PRODUCT CHARACTERISTICS

V <sub>DS</sub>	60V
R <sub>DS(ON)Typ</sub> (V <sub>GS</sub> @ =10V)	9 mΩ
R <sub>DS(ON)Typ</sub> (V <sub>GS</sub> @ =4.5V)	14mΩ
I <sub>D</sub>	35A

■ FEATURES

- Low R<sub>DS(ON)</sub>
- Low gate charge
- Pb-free lead plating
- Halogen-free and ROHS-compliant

■ APPLICATIONS

- Motor driving in power tool
- E-vehicle robotics

■ ORDER INFORMATION

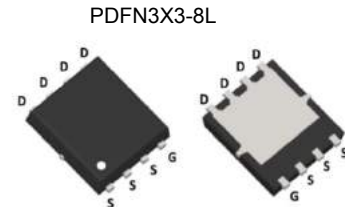
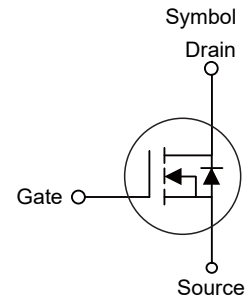
Order codes		Package	Packing
Halogen-Free	Halogen		
N/A	MOT6511G	PDFN5X6	5000Pieces/Reel

■ ABSOLUTE MAXIMUM RATINGS(T<sub>C</sub> = 25°C, unless otherwise specified)

Parameter	Symbol	Value	Unit
Drain-to-Source Voltage	V <sub>DS</sub>	60	V
Gate-to-Source Voltage	V <sub>GS</sub>	±20	V
Continuous Drain	I <sub>D</sub>	T <sub>C</sub> = 25°C	35
		T <sub>C</sub> = 100°C	27
Pulsed Drain Current	I <sub>DM</sub>	160	A
Avalanche Energy	E <sub>AS</sub>	96	mJ
Power Dissipation	P <sub>D</sub>	41	W
Junction & Storage Temperature Range	T <sub>J</sub> , T <sub>STG</sub>	-55 to 150	°C

■ THERMAL PERFORMANCE

Parameter	Symbol	Value	Unit
Thermal Resistance, Junction-to-Case	R <sub>θJC</sub>	3.05	°C/W



**■ Electrical Characteristics ( $T_C=25^\circ\text{C}$  unless otherwise specified)**

Parameter	Symbol	Conditions	Min	Typ	Max	Unit
<b>STATIC PARAMETERS</b>						
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	$I_D = 250\mu\text{A}, V_{GS} = 0\text{V}$	60	-	-	V
Zero Gate Voltage Drain Current	$I_{DSS}$	$V_{DS} = 60\text{V}, V_{GS} = 0\text{V}$ $T_J = 55^\circ\text{C}$	-	-	1.0	$\mu\text{A}$
			-	-	5.0	
Gate-Body Leakage Current	$I_{GSS}$	$V_{DS} = 0\text{V}, V_{GS} = \pm 20\text{V}$	-	-	$\pm 100$	nA
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS} = V_{GS}, I_D = 250\mu\text{A}$	1.0	-	3.0	V
Static Drain-Source ON-Resistance	$R_{DS(ON)}$	$V_{GS} = 10\text{V}, I_D = 20\text{A}$	-	9	11	$\text{m}\Omega$
		$V_{GS} = 4.5\text{V}, I_D = 15\text{A}$	-	14	19	$\text{m}\Omega$
Forward Transconductance	$g_{FS}$	$V_{DS} = 5\text{V}, I_D = 20\text{A}$	10	-	-	S
Diode Forward Voltage	$V_{SD}$	$I_S = 20\text{A}, V_{GS} = 0\text{V}$	-	-	1.2	V
Diode Continuous Current	$I_S$	$T_C = 25^\circ\text{C}$	-	-	35	A
<b>DYNAMIC PARAMETERS</b>						
Input Capacitance	$C_{iss}$	$V_{GS} = 0\text{V}, V_{DS} = 30\text{V}, f = 1\text{MHz}$	-	1010	-	pF
Output Capacitance	$C_{oss}$		-	183.2	-	pF
Reverse Transfer Capacitance	$C_{rss}$		-	9.9	-	pF
<b>SWITCHING PARAMETERS</b>						
Total Gate Charge	$Q_g$	$V_{GS} = 10\text{V}$ $V_{DS} = 30\text{V}, I_D = 20\text{A}$	-	22.6	-	nC
Gate Source Charge	$Q_{gs}$		-	4.7	-	nC
Gate Drain Charge	$Q_{gd}$		-	3.7	-	nC
Turn-On DelayTime	$t_{D(on)}$	$V_{DD} = 30\text{V}, I_D = 20\text{A}$ $V_{GS} = 10\text{V}, R_{GEN} = 1.6\Omega$	-	4.3	-	nS
Turn-On Rise Time	$t_r$		-	2.7	-	nS
Turn-Off DelayTime	$t_{D(off)}$		-	13.8	-	nS
Turn-Off Fall Time	$t_f$		-	2.7	-	nS
Body Diode Reverse Recovery Time	$t_{rr}$	$I_F = 20\text{A}, dI_F/dt = 100\text{A}/\mu\text{s}$	-	18	-	nS
Body Diode Reverse Recovery Charge	$Q_{rr}$	$I_F = 20\text{A}, dI_F/dt = 100\text{A}/\mu\text{s}$	-	12	-	nC

■ TYPICAL CHARACTERISTICS

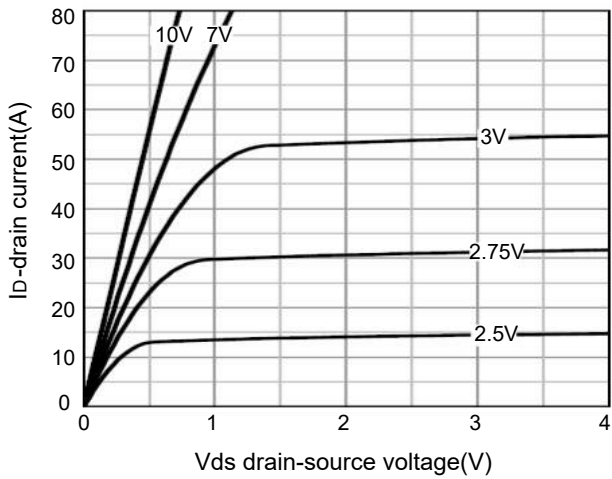


Figure 1 output characteristics

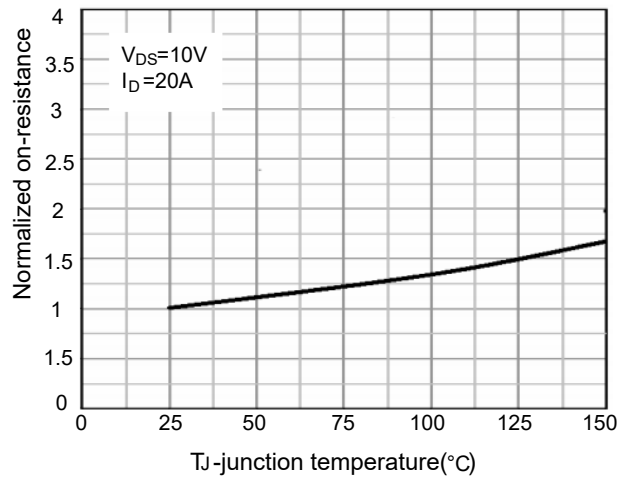


Figure 2  $r_{DS(on)}$ -junction temperature

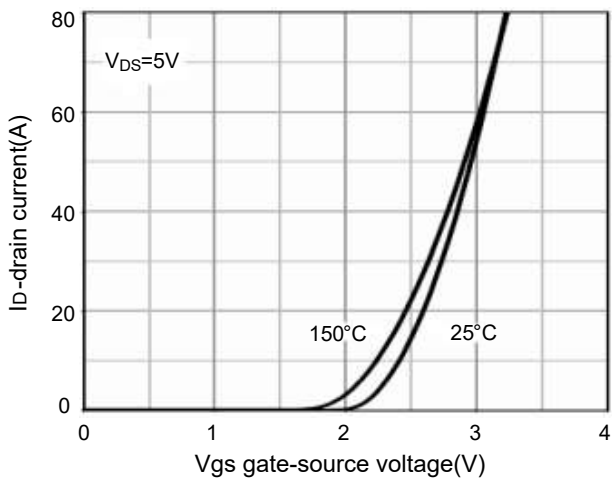


Figure 3 transfer characteristics

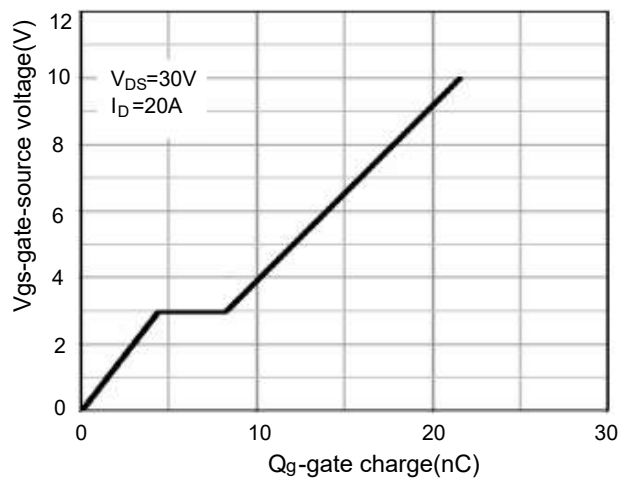


Figure 4 gate charge

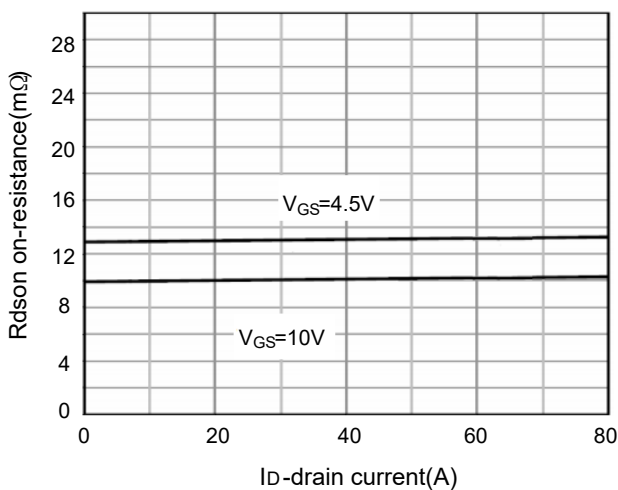


Figure 5  $r_{DS(on)}$ -drain current

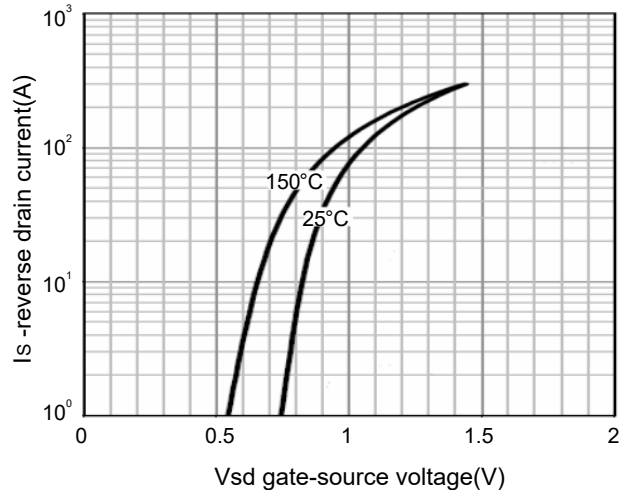


Figure 6 source-drain diode forward

■ TYPICAL CHARACTERISTICS(Cont.)

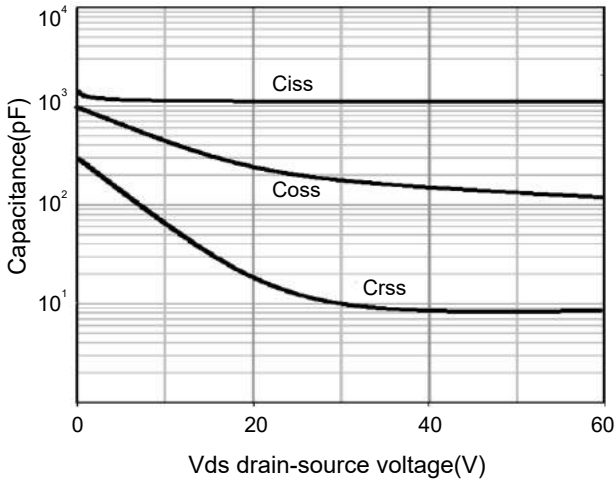


Figure 7 capacitance vs vds

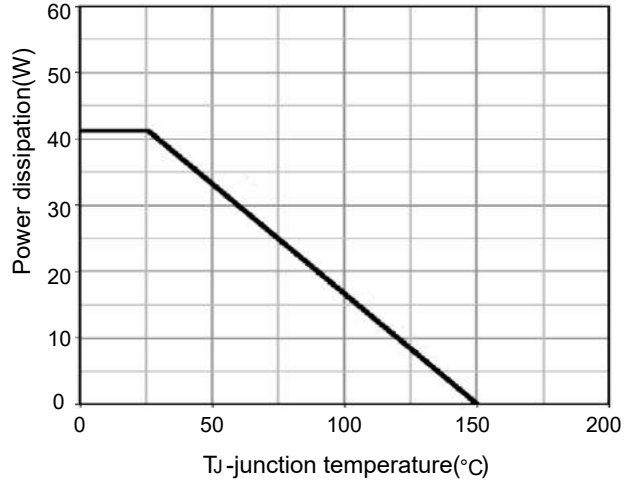


Figure 8 power de-rating

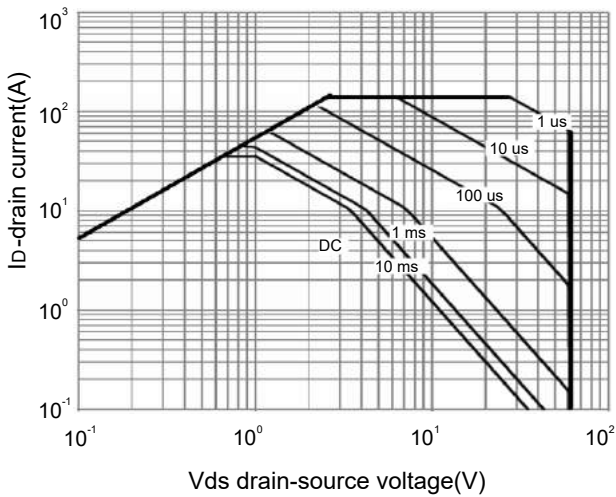


Figure 9 safe operation area

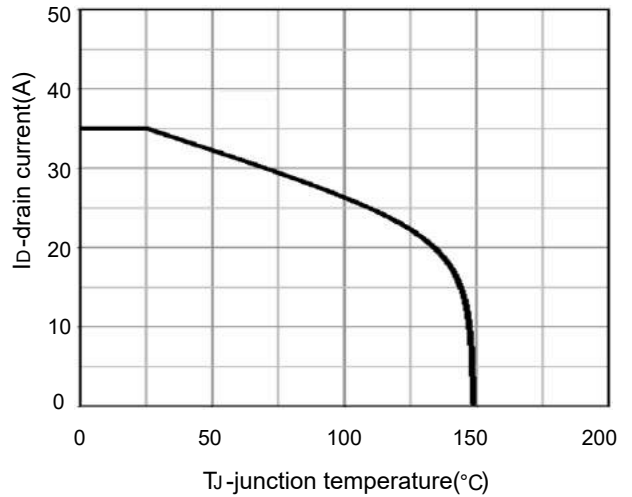


Figure 10 current de-rating

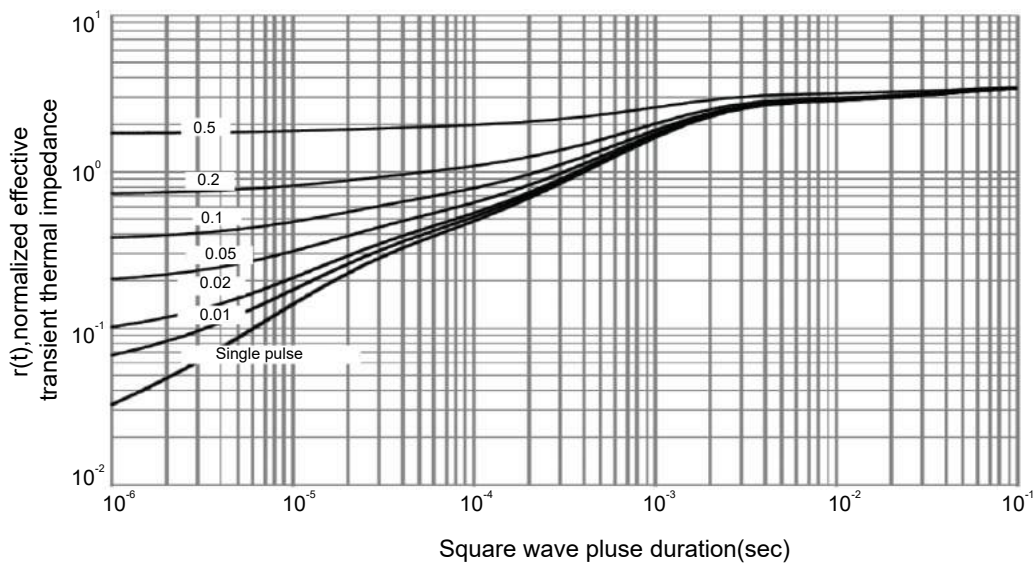
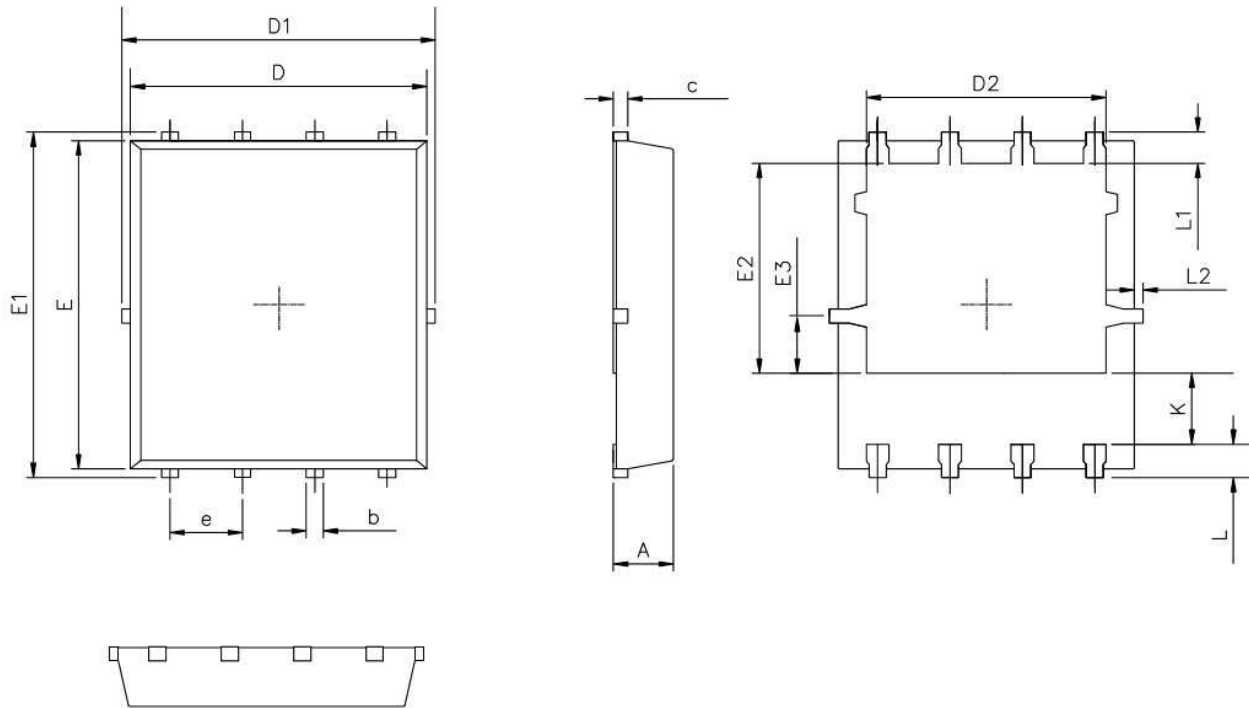
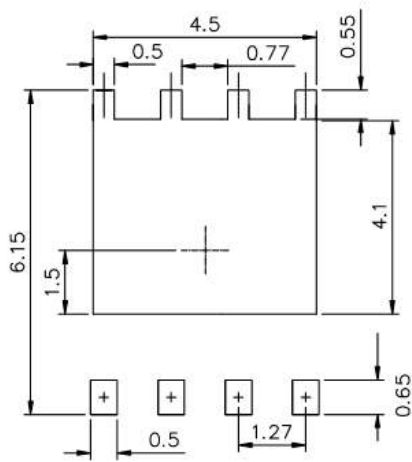


Figure 10 normalized maximum transient thermal impedance

■ PDFN5X6-8L Package mechanical data



RECOMMENDED LAND PATTERN



UNIT:mm

	MIN	NOM	MAX
A	0.90	1.00	1.10
b	0.25	0.35	0.50
c	0.10	0.20	0.30
D	4.80	5.00	5.30
D1	4.90	5.10	5.50
D2	3.92	4.02	4.20
E	5.65	5.75	5.85
E1	5.90	6.05	6.20
E2	3.325	3.525	3.775
E3	0.80	0.90	1.00
e		1.27	
L	0.40	0.55	0.70
L1		0.65	
L2	0.00		0.15
K	1.00	1.30	1.50

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