

PRODUCT CHARACTERISTICS

V_{DS}	60V
$R_{DS(ON)Typ}(V_{GS} @ =10V)$	9 m Ω
$R_{DS(ON)Typ}(V_{GS} @ =4.5V)$	14 m Ω
I_D	35A

FEATURES

- Low $R_{DS(ON)}$
- Low gate charge
- Pb-free lead plating
- Halogen-free and ROHS-compliant

APPLICATIONS

- Motor driving in power tool
- E-vehicle robotics

ORDER INFORMATION

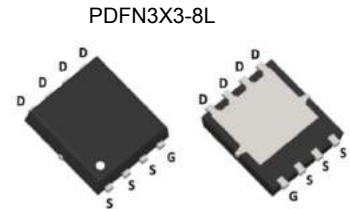
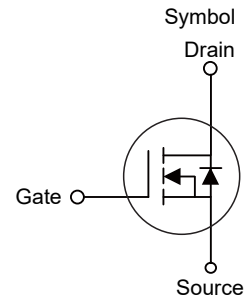
Order codes		Package	Packing
Halogen-Free	Halogen		
N/A	MOT6511J	PDFN3X3	5000Pieces/Reel

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

Parameter		Symbol	Value	Unit
Drain-to-Source Voltage		V_{DS}	60	V
Gate-to-Source Voltage		V_{GS}	±20	V
Continuous Drain	T _C = 25°C	I _D	35	A
	T _C = 100°C		27	A
Pulsed Drain Current		I _{DM}	160	A
Avalanche Energy		E _{AS}	96	mJ
Power Dissipation		P _D	41	W
Junction & Storage Temperature Range		T _J , T _{STG}	-55 to 150	°C

THERMAL PERFORMANCE

Parameter	Symbol	Value	Unit
Thermal Resistance, Junction-to-Case	$R_{\theta JC}$	3.05	$^{\circ}C/W$



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

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

■ TYPICAL CHARACTERISTICS

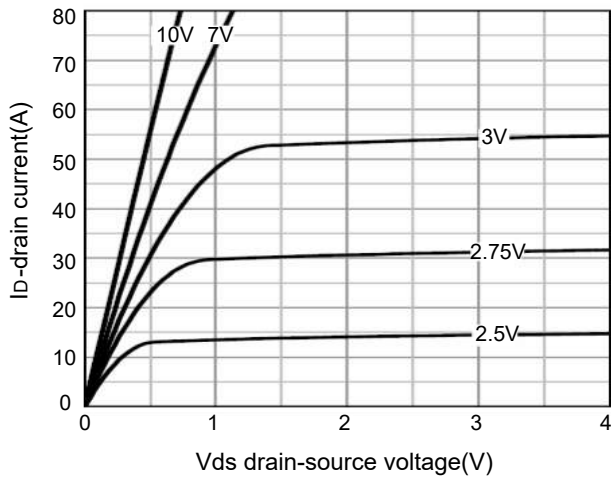


Figure 1 output characteristics

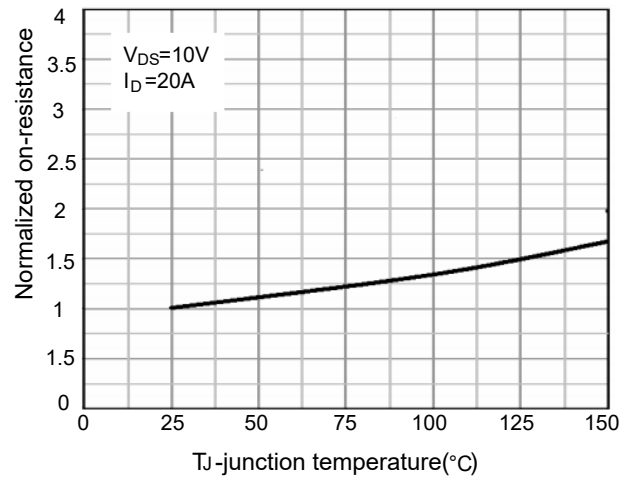


Figure 2 rdson-junction temperature

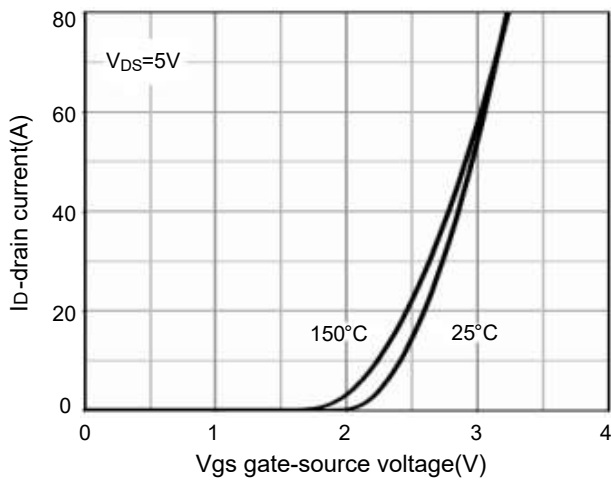


Figure 3 transfer characteristics

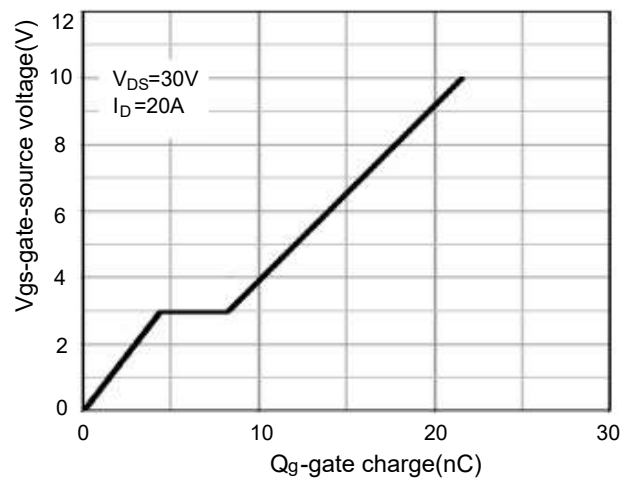


Figure 4 gate charge

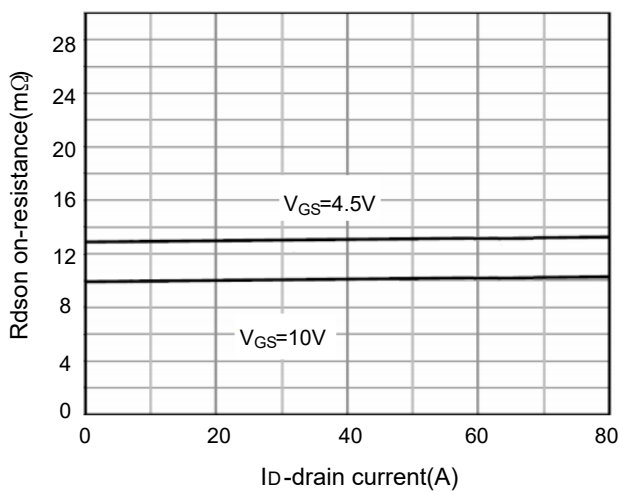


Figure 5 rdson-drain current

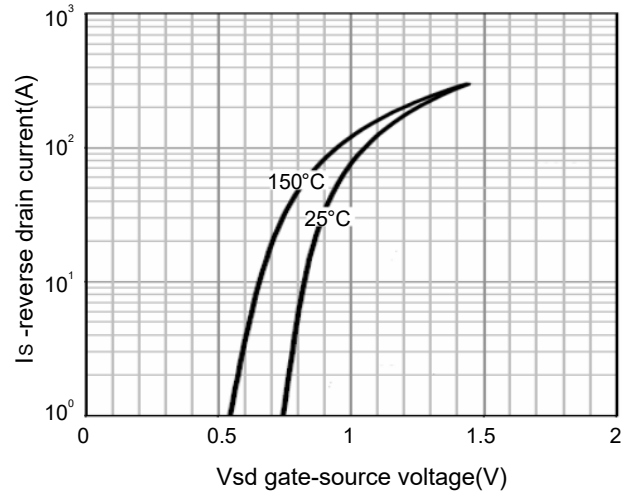
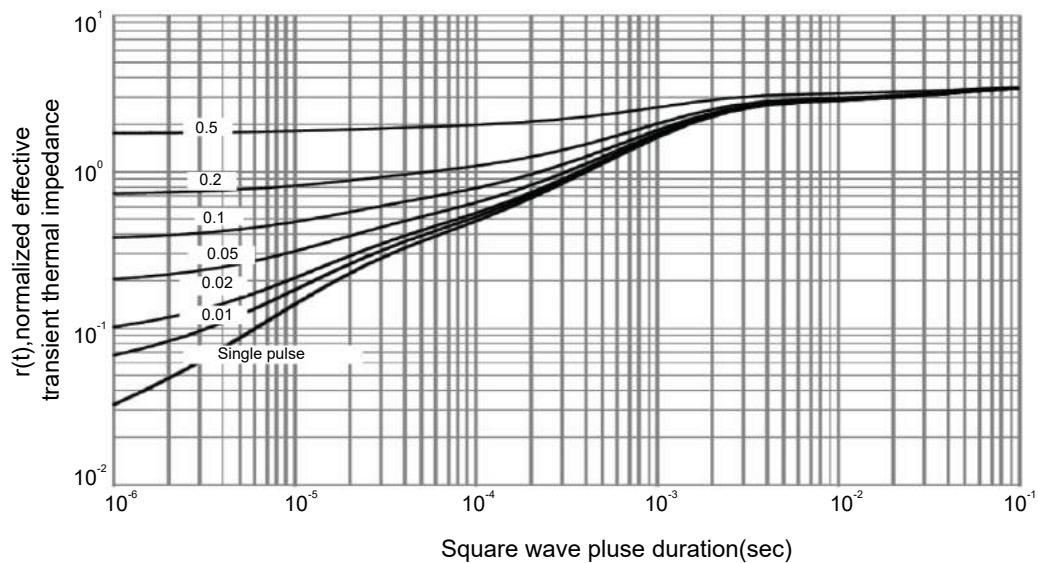
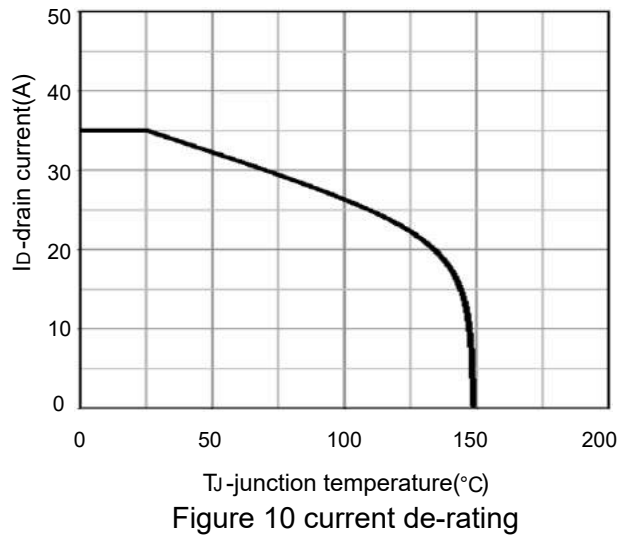
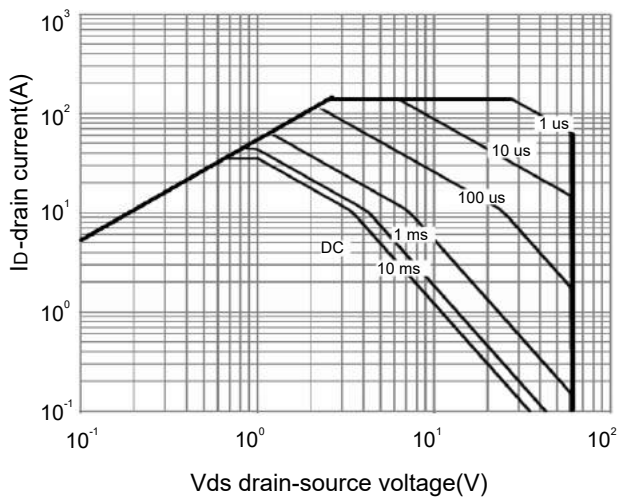
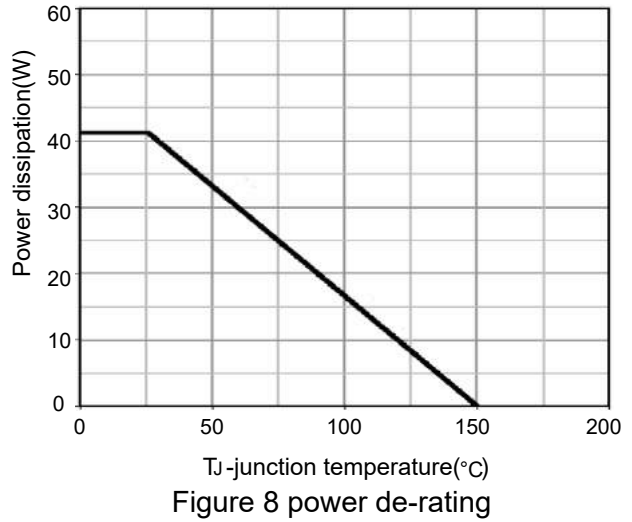
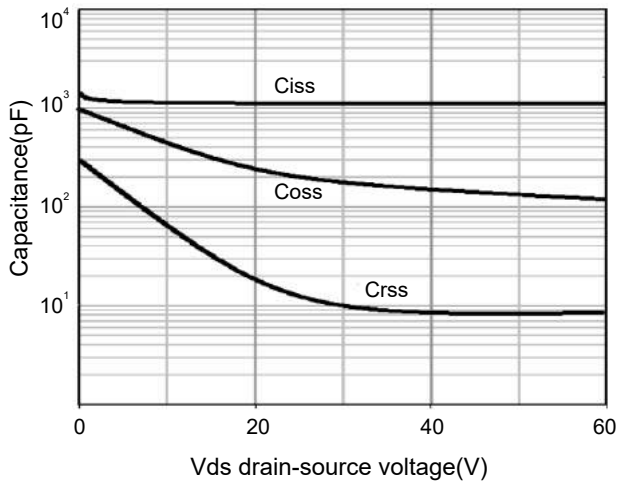
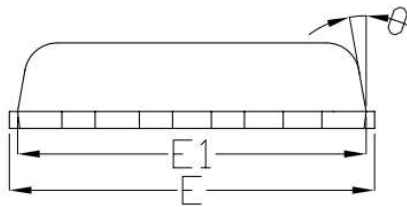
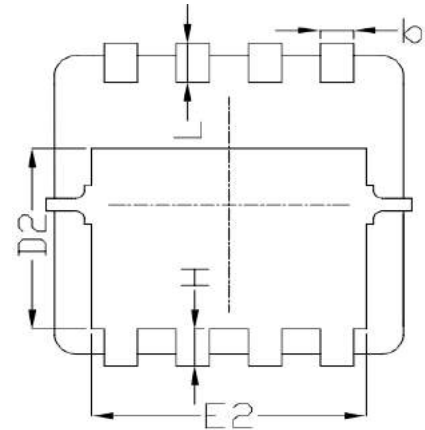
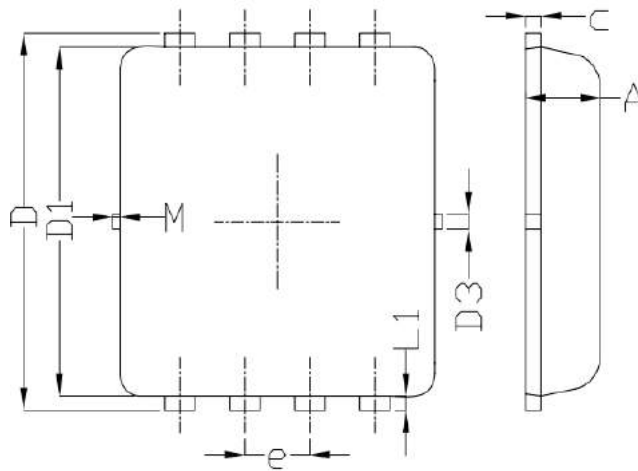


Figure 6 source-drain diode forward

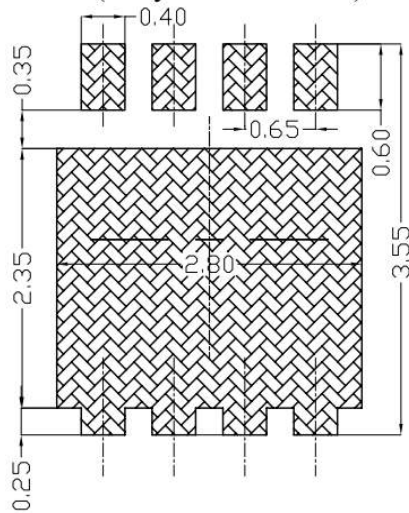
■ TYPICAL CHARACTERISTICS(Cont.)



■ PDFN3X3-8L Package Mechanical Data



Land Pattern
(Only for Reference)



SYMBOL	DIMENSIONAL REQMTS		
	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			