

**600V N-Channel Super Junction MOSFET**

<b>Voltage</b>	<b>600 V</b>	<b>Rdson</b>	<b>120 mΩ</b>
<b>Current</b>	<b>30 A</b>	<b>Qg</b>	<b>51 nC</b>

**Feature:**

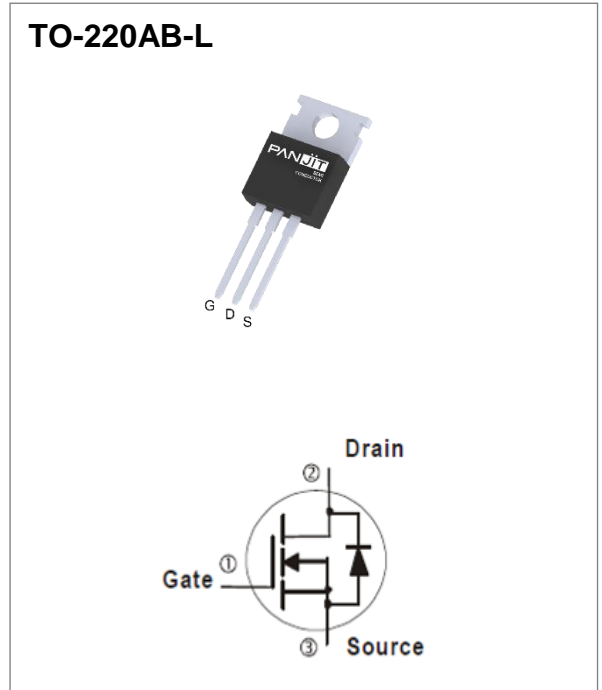
- $R_{DS(ON) Max, V_{GS}@10V}$ : 120mΩ
- Easy to use/ drive
- High Speed Switching and Low  $R_{DS(ON)}$
- 100% Avalanche Tested
- 100% Rg Tested
- Lead free in compliance with EU RoHS 2.0
- Green molding compound as per IEC 61249 standard

**Mechanical Data**

- Case: TO-220AB-L package
- Terminals: Solderable per MIL-STD-750, Method 2026
- Approx. Weight: 0.0739 ounces, 2.0948 grams

**Application**

- PFC, TV Power, PC Power, PD Charger, Adapter, UPS



**Absolute Maximum Ratings** ( $T_A = 25\text{ }^\circ\text{C}$  unless otherwise specified)

PARAMETER		SYMBOL	LIMIT	UNITS
Drain-Source Voltage @ $T_{jmax}$		$V_{DS}$	650	V
Drain-Source Voltage		$V_{DS}$	600	
Gate-Source Voltage		$V_{GS}$	$\pm 30$	
Continuous Drain Current	$T_C=25^\circ\text{C}$	$I_D$	30.0	A
	$T_C=100^\circ\text{C}$		18.5	
Pulsed Drain Current	$T_C=25^\circ\text{C}$	$I_{DM}$	69	A
Single Pulse Avalanche Energy		$E_{AS}$	670	mJ
MOSFET dv/dt ruggedness		dv/dt	50	V/ns
Power Dissipation	$T_C=25^\circ\text{C}$	$P_D$	235	W
	$T_C=100^\circ\text{C}$		94	
Operating Junction and Storage Temperature Range		$T_J, T_{STG}$	-55~150	$^\circ\text{C}$

**Thermal Characteristics**

PARAMETER		SYMBOL	MAXIMUM	UNITS
Thermal Resistance	Junction-to-Case	$R_{\theta JC}$	0.53	$^\circ\text{C/W}$
	Junction-to-Ambient (Note 3)	$R_{\theta JA}$	62.5	$^\circ\text{C/W}$

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

PARAMETER	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNITS
<b>Static</b>						
Drain-Source Breakdown Voltage	$BV_{DSS}$	$V_{GS}=0V, I_D=250\mu A$	600	710	-	V
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS}=V_{GS}, I_D=250\mu A$	2	3.0	4	
Drain-Source On-State Resistance	$R_{DS(on)}$	$V_{GS}=10V, I_D=12A$ (Note 1)	-	104	120	m $\Omega$
Zero Gate Voltage Drain Current	$I_{DSS}$	$V_{DS}=600V, V_{GS}=0V$	-	-	1	$\mu A$
Gate-Source Leakage Current	$I_{GSS}$	$V_{GS}=\pm 30V, V_{DS}=0V$	-	-	$\pm 100$	nA
Transfer characteristics	gfs	$V_{DS}=20V, I_D=22A$	-	24	-	S
<b>Dynamic</b> (Note 5)						
Total Gate Charge	$Q_g$	$V_{DS}=480V, I_D=22A,$ $V_{GS}=10V$	-	51	-	nC
Gate-Source Charge	$Q_{gs}$		-	11	-	
Gate-Drain Charge	$Q_{gd}$		-	19	-	
Input Capacitance	$C_{iss}$	$V_{DS}=400V, V_{GS}=0V,$ $f=250kHz$	-	1960	-	pF
Output Capacitance	$C_{oss}$		-	66	-	
Reverse Transfer Capacitance	$C_{rss}$		-	7	-	
Effective Output Capacitance Energy Related	$C_{o(er)}$	$V_{DS}=0V$ to 400V, $V_{GS}=0V, f=250kHz$ (Note 4)	-	95	-	
Turn-On Delay Time	$t_{d(on)}$	$V_{DD}=300V, I_D=22A,$ $V_{GS}=10V, R_G=25\Omega$ (Note 2)	-	43	-	ns
Turn-On Rise Time	$t_r$		-	76	-	
Turn-Off Delay Time	$t_{d(off)}$		-	173	-	
Turn-Off Fall Time	$t_f$		-	81	-	
Gate Resistance	$R_g$	$f=1.0MHz$	-	2.3	-	$\Omega$
<b>Drain-Source Diode</b>						
Maximum Continuous Drain-Source Diode Forward Current	$I_S$		-	-	30	A
Diode Forward Voltage	$V_{SD}$	$I_S=24A, V_{GS}=0V$	-	0.90	1.5	V
Reverse Recovery Charge	$Q_{rr}$	$I_S=22A$	-	6.6	-	$\mu C$
Reverse Recovery Time	$T_{rr}$	$di/dt=100A/\mu s$	-	410	-	ns

NOTES :

1. Pulse width  $\leq 300\mu s$ , Duty cycle  $\leq 2\%$
2. Essentially independent of operating temperature typical characteristics.
3.  $R_{\theta JA}$  is the sum of the junction-to-case and case-to-ambient thermal resistance.
4.  $C_{o(er)}$  is a capacitance that gives the same stored energy as  $C_{oss}$  while  $V_{DS}$  is rising from 0V to 80%  $V_{(BR)DSS}$
5. Guaranteed by design, not subject to production testing

TYPICAL CHARACTERISTIC CURVES

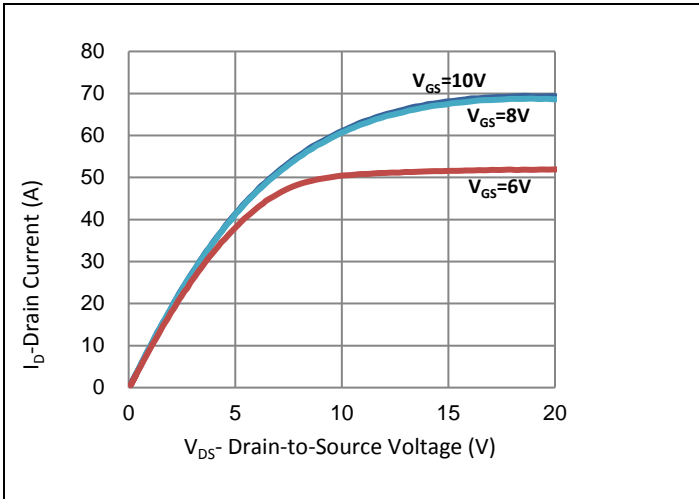


Fig.1 Output Characteristics

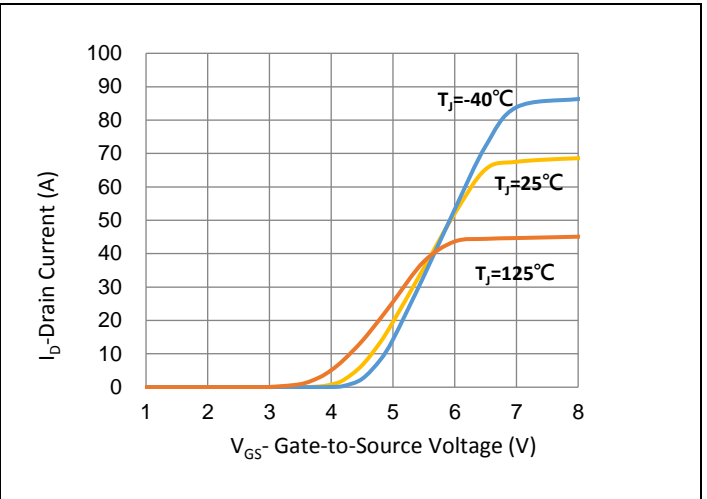


Fig.2 Transfer Characteristics

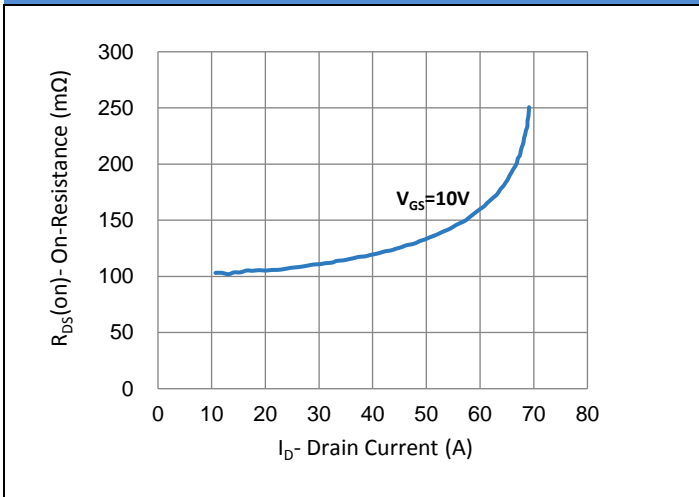


Fig.3 On-Resistance vs. Drain Current

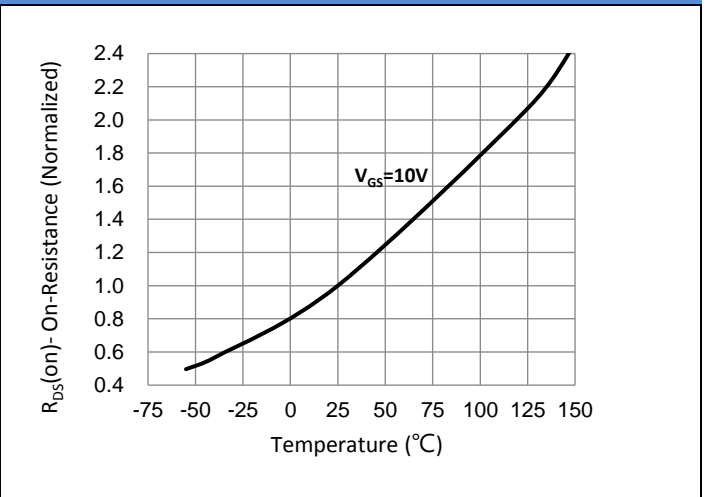


Fig.4 On-Resistance vs. Junction Temperature

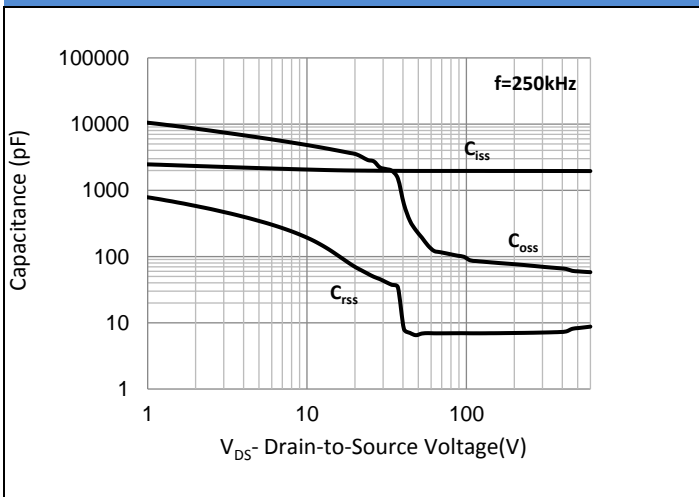


Fig.5 Capacitance vs. Drain-Source Voltage

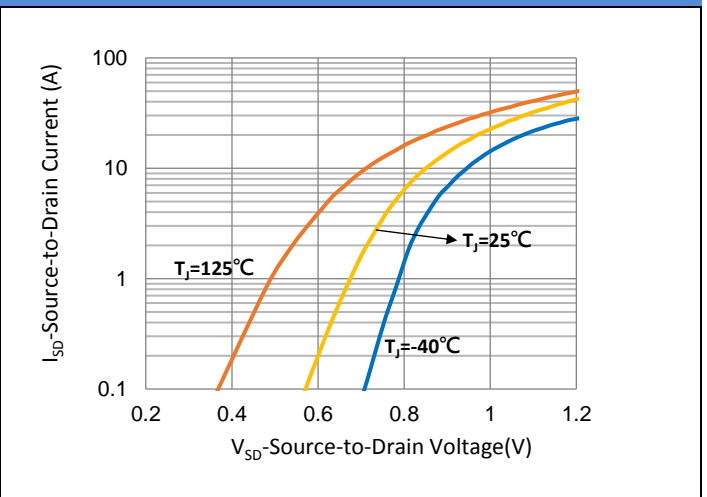


Fig.6 Source-Drain Diode Forward Voltage

TYPICAL CHARACTERISTIC CURVES

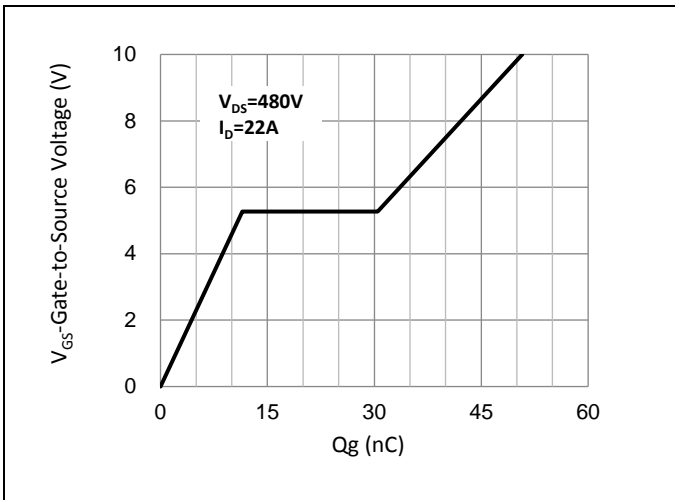


Fig.7 Gate-Charge Characteristics

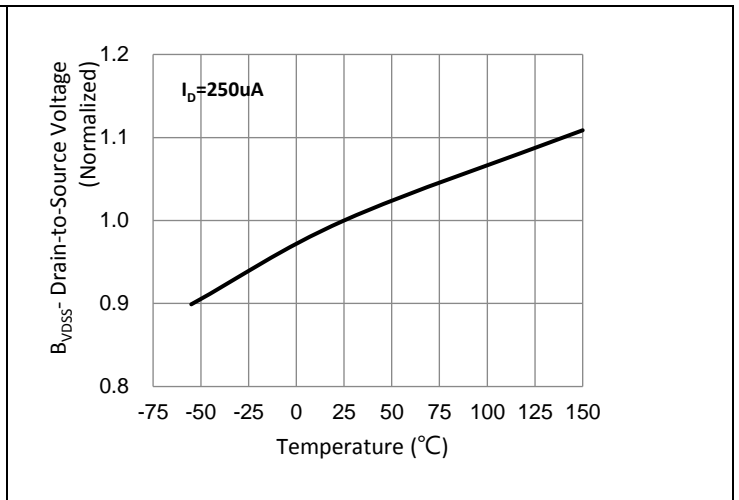


Fig.8 Breakdown Voltage Variation vs. Temperature

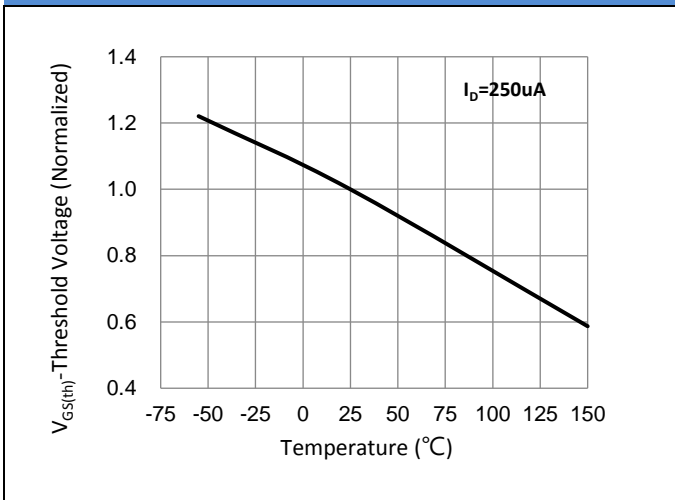


Fig.9 Threshold Voltage Variation with Temperature

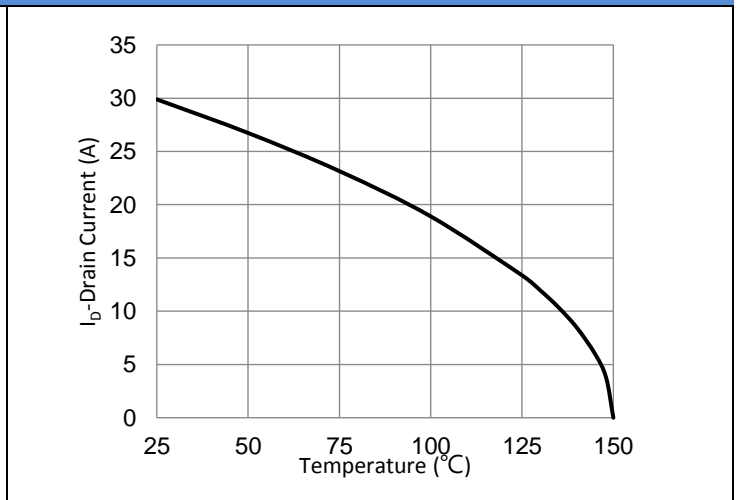


Fig.10 Drain Current vs. Case Temperature

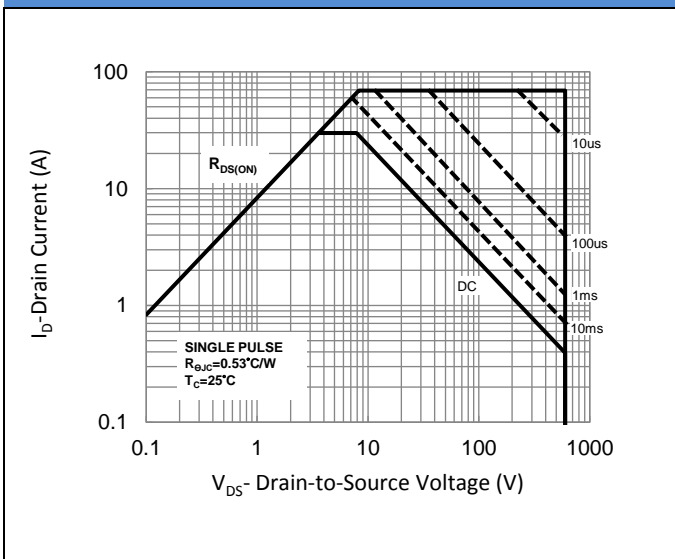


Fig.11 Maximum Safe Operating Area

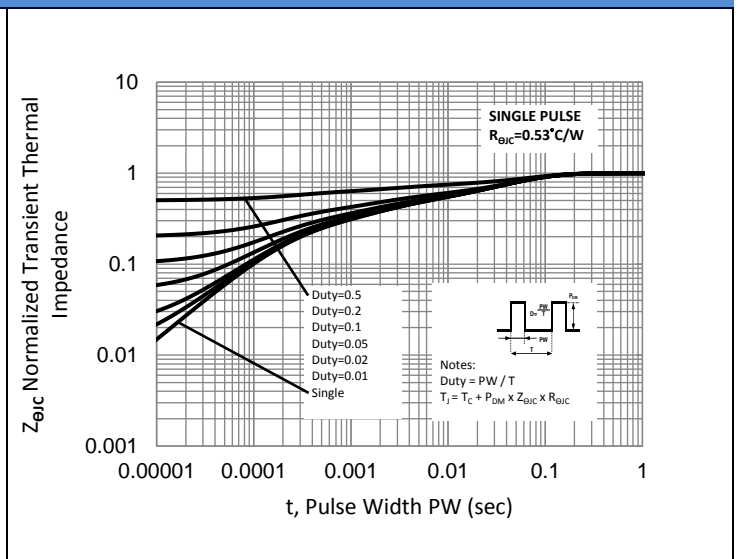
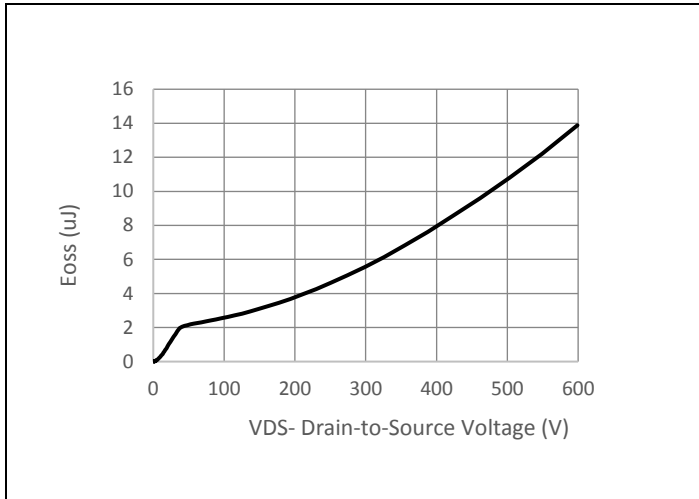


Fig.12 Normalized Transient Thermal Impedance

## TYPICAL CHARACTERISTIC CURVES

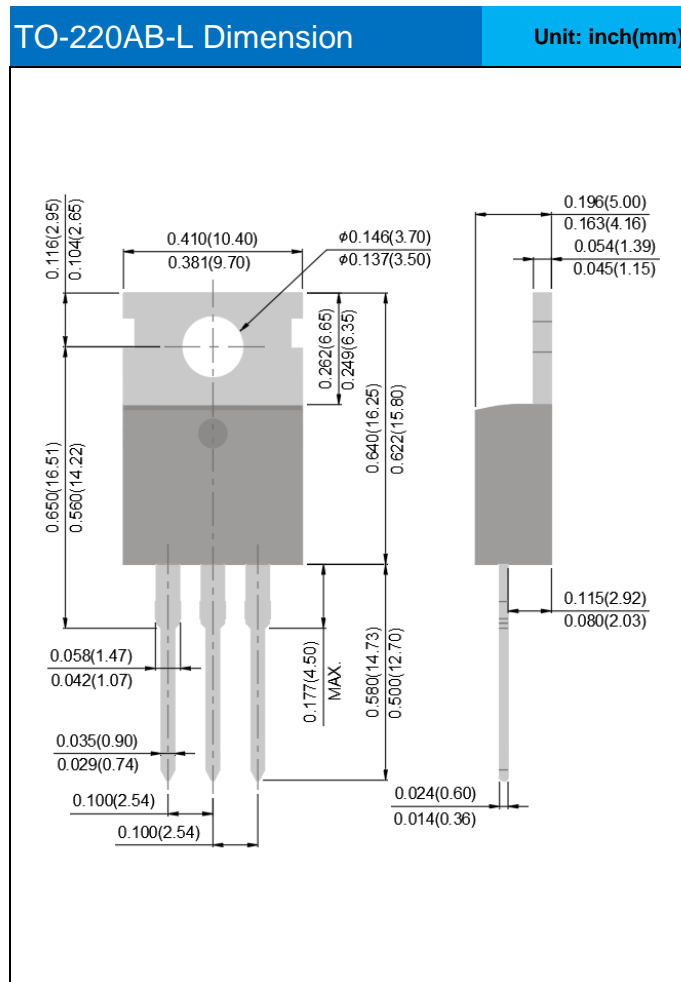


**Fig.13 Typ. Coss Stored Energy**

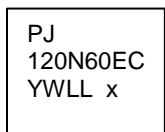
**Product and Packing Information**

Part No.	Package Type	Packing Type	Marking
PJMP120N60EC	TO-220AB-L	50pcs / Tube	120N60EC

**Packaging Information**



**Marking Diagram**



- Y** = Year Code
- W** = Week Code (A~Z)
- LL** = Lot Code (00~99)
- x** = Production Line Code

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